

Facility Response Plan

Prepared for
Nautilus Pipeline Company, L.L.C.

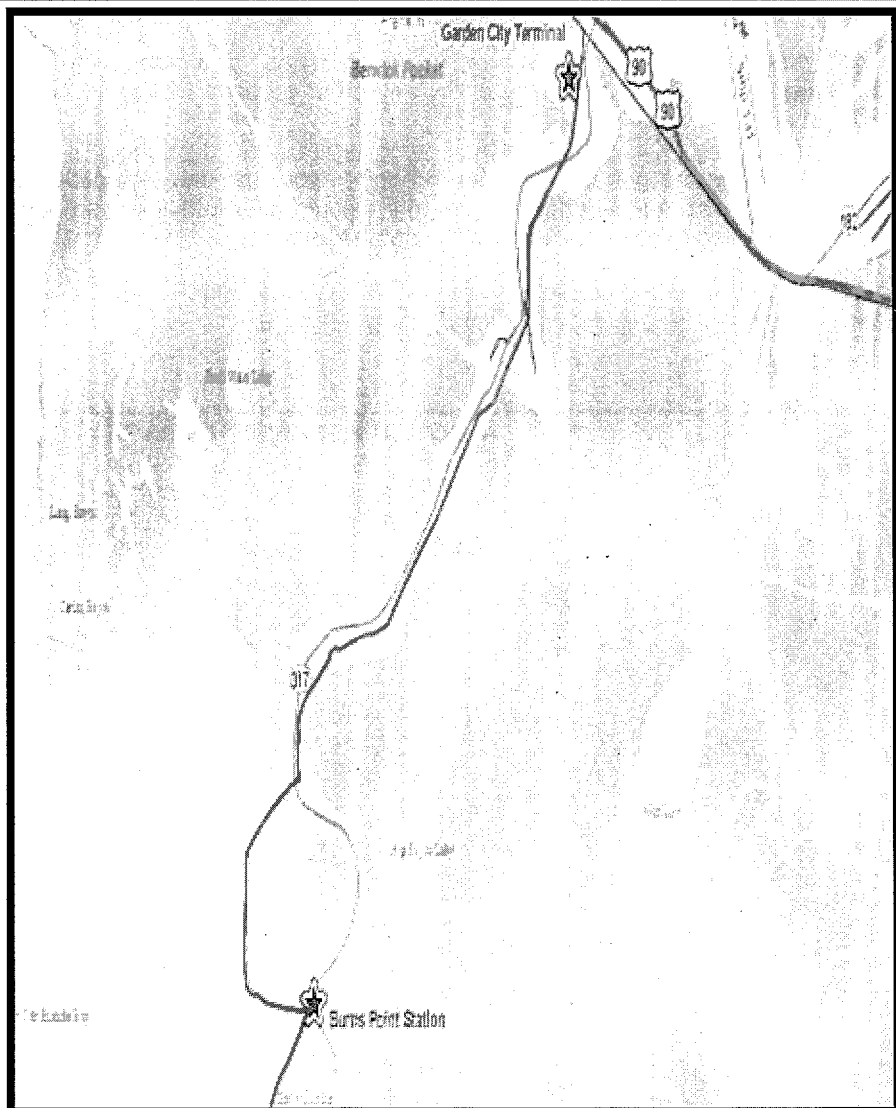
Nautilus Facilities

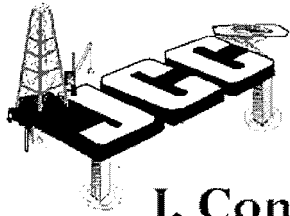
May 2011



www.jccteam.com

Prepared By:
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**J. Connor
Consulting, Inc.**

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Facility Response Plan

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Nautilus Pipeline Company, L.L.C.

Nautilus Facility

May 2011

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Nautilus Pipeline Company, L.L.C.
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Quick Reference Guide

Facility	Owner and Operator
Nautilus Facility	Enbridge Offshore Gas Transmission
215 Nautilus Lane Centerville, Louisiana 70522	195 Equity Boulevard Houma, Louisiana 70360

The Nautilus 30" Gas Pipeline is a FERC regulated interstate offshore pipeline system, operating in the Gulf of Mexico and governed by the requirements of CFR Title 49; Parts 190, 191, 192 and 199 and CFR Title 30; Part 250 Subpart J. Nautilus Pipeline Company, L.L.C. is the Operator of the pipeline and those Nautilus and Manta Ray facilities located at the Garden City Terminal in Centerville, LA.

Qualified Individual	Office	Mobile (24Hrs)	Home
Mark Poteet	(832) 214-9499	(b) (6)	
Fred Whitted	(713) 821-1219		

Nautilus Operations Technician Info	Home	Cell	Alternate Phone	
Office Phone: (337) 836-9510 Ext. 74123				
A-Crew				
Bryan Carpentier	(b) (6)		(337) 230-5903	
Roy Hebert			(337) 376-8964	
Kellie Robertson			(985) 991-5229	
B-Crew				
Larry Bushnelle			(337) 578-3386	
Brett McNabb			(338) 540-9318	
Ralph Segura			(985) 372-1485	

Oil Spill Response Organizations	
O'Brien Response Management Inc. (O'Brien's)	(985) 781-0804
Clean Harbors Environmental Services, Inc	(800) 645-8265
ES&H, Inc	(877) 437-2634
Ampol	(800) 482-6765

Federal Contacts	
USCG National Response Center, Washington, DC	(800) 424-8802
USCG—MSU Morgan City	(985) 380-5320
USCG—MSU Lake Charles	(337) 491-7800
USCG—MSU Houma	(985) 857-8507
USCG Sector New Orleans	(504) 846-6184
USCG Search and Rescue	(504) 589-6225
U.S. EPA (Region VI-Dallas, TX)	(866) 372-7745
U.S. EPA On-Scene Coordinator	(800) 533-3508
U.S. Fish and Wildlife Service	(225) 578-4243
U.S. Army Corps of Engineers (New Orleans District)	(504) 862-2201
OSHA	(800) 321-6742
Wildlife Rehab and Education	(713) 861-9453
Wildlife Response Services LLC	(713) 705-5897 (281) 266-0054 (pager)

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State Contacts	
Louisiana One-Call (State Police)	(225) 925-6113
Louisiana Department of Environmental Quality	(866) 896-5337
Louisiana Oil Spill Coordinator	(225) 925-6606
Louisiana Department of Natural Resources	(225) 342-4500
Louisiana Department of Wildlife and Fisheries	(225) 765-2800
Louisiana Department of Public Safety	(337) 491-2511

Local Contacts – 911	
Louisiana Poison Control	(800) 222-1222
Iberia Parish	
Iberia Parish Sheriff's Office-New Iberia	(337) 369-3714
Iberia Parish Office of Homeland Security (OHS) & Emergency Preparedness	(337) 369-4427
St. Martin Parish	
St. Martin Parish Sheriff's Office-St. Martinville	(337) 394-3071
St. Martin Parish Office of Homeland Security (OHS) & Emergency Preparedness	(337) 394-3071
Arnaudville Police Department	(337) 754-5913
Breaux Bridge Police Department	(337) 332-2186
Henderson Police Department	(337) 228-2065
St. Martinville Police Department	(337) 394-2226
Arnaudville Fire Department	(337) 754-5089
Breaux Bridge Fire Department	(337) 332-2795
Henderson Fire Department	(337) 228-2181
St. Martin Parish Fire District	(337) 332-1314
St. Mary Parish	
St. Mary Parish Sheriff's Office-Franklin	(337) 828-1960
St. Mary Parish Office of Homeland Security (OHS) & Emergency Preparedness	(337) 828-4100
Terrebonne Parish	
Terrebonne Parish Sheriff's Office-Houma	(985) 876-2500
Terrebonne Parish Office of Homeland Security (OHS) & Emergency Preparedness	(985) 873-6357
Houma Police Department	(504) 873-6306
Houma Fire Department	(985) 873-6391

Medical Services	
Louisiana Poison Control	(800) 222-1222
Iberia Parish	
Iberia Medical Center – New Iberia	(337) 364-0441
St. Martin Parish	
St. Martin Hospital-Breaux Bridge	(337) 332-2178
St. Mary Parish	
Franklin Foundation Hospital-Franklin	(337) 828-0760
Teche Regional Medical Center-Morgan City	(985) 384-2200
Terrebonne Parish	
Leonard J. Chabert Medical Center-Houma	(985) 873-2200
Terrebonne General Hospital-Houma	(985) 873-4141

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1.0 Plan Introduction Elements

1.1 Purpose and Scope of Plan Coverage

The specific guidelines presented in this plan have been carefully thought out and prepared in accordance with safe practices. This plan has the full approval of management at a level with authority to commit the necessary resources to implement this plan.

The purpose of this plan is to provide a written procedure for directing a plan of action in the event of a release/discharge of oil or oil based products.

The overall objective of this plan is to minimize any release that might endanger lives or property, or may jeopardize personnel outside of the facility. Personnel will utilize all resources necessary to bring any release under control. In order to prepare for such control, all personnel will be well trained and knowledgeable as to their role during a release.

Specifically, this plan:

- Identifies the Qualified Individuals (QI) having full authority to implement this response plan
- Requires immediate communication with the appropriate federal officials and persons providing personnel and equipment
- Identifies and ensures by contract or other means approved by the owner/operator, the availability of private personnel and equipment necessary to remove a worst-case discharge and mitigate or prevent a substantial threat of such a discharge
- Describes training, equipment testing, periodic drills, and response actions

1.2 Regulatory Applicability

ETC Hydrocarbons has reviewed the National Contingency Plan and the MSU Morgan City (Southeast Louisiana) Area Contingency Plan. This plan is consistent with both and was written to comply with the following:

PHMSA, DOT

49 CFR 194—Facility Response Plan (FRP)

This regulation applies to an operator of an onshore oil pipeline that, because of its location, could reasonably be expected to cause substantial harm, or significant and substantial harm to the environment by discharging oil into or on any navigable waters of the United States or adjoining shorelines.

OSHA

29 CFR 1910.38 and 1910.196—Emergency Response Plan (ERP)

The ERP portion has been prepared in accordance with the Occupational Health and Safety Administration regulations, Parts 1910.38—Emergency Action Plan and 1910.106—Fire Prevention Plan. Specifically, this plan outlines fire, evacuation, operations and notification procedures.

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1.3 Plan Distribution

Plan Number	Plan Holder	Location
1	John Brennan	195 Equity Blvd. Houma, LA 70360
2	Matt Howard	195 Equity Blvd. Houma, LA 70360
3	Depp Cheramie	195 Equity Blvd. Houma, LA 70360
4	Houma Office	195 Equity Blvd. Houma, Louisiana 70360
5	Nautilus Facility	195 Equity Blvd. Houma, Louisiana 70360
6	Les Stevens	195 Equity Blvd. Houma, Louisiana 70360
7	Christine Storm	1100 Louisiana, Ste 3300 Houston, TX 77002
8	Michael Brockmyre	1100 Louisiana, Ste 3300 Houston, TX 77002
9	Susan Schwager / James Sonnier	1100 Louisiana, Ste 3300 Houston, TX 77002
10	Kim Tran / Jason Bush	1100 Louisiana, Ste 3300 Houston, TX 77002
11	Terry Moller	1100 Louisiana, Ste. 3300 Houston, TX 77002
12	Jehiel Lewis	1100 Louisiana, Ste. 3300 Houston, TX 77002
13	Terry McMillin	1100 Louisiana, Ste. 3300 Houston, TX 77002

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Plan Number	Plan Holder	Location
14	Jerry Walker / Ruby Lindsey	1100 Louisiana, Ste. 3300 Houston, TX 77002
15	Terry Larson / Larry Springer	1100 Louisiana, Ste. 3300 Houston, TX 77002
16	Joan Gay / Rick Greenawalt	1100 Louisiana, Ste. 3300 Houston, TX 77002
17	Jeff Jackson	1100 Louisiana, Ste. 3300 Houston, TX 77002
18	Fred Whitted	1100 Louisiana, Ste. 3300 Houston, TX 77002
19	Michael Shannon	1100 Louisiana, Ste. 3300 Houston, TX 77002
20, 21, 22	Rod Brinkley	1100 Louisiana, Suite 3300 Houston, TX 77002
23	(electronic copy) O'Brien Response Management Inc. (O'Brien's)	2000 Old Spanish Trail Suite 210 Slidell, Louisiana 70458
24, 25	David Lehman, ESSD Director (2 electronic copies) phmsa.opa90@dot.gov	Office of Pipeline Safety (Attn: Response Plan Review) U.S. Department of Transportation PHP-5, East Building, 2nd floor, E22-321 1200 New Jersey Avenue, S.E., Washington, D.C. 20590

1.4 Plan Review and Revision

PHMSA, DOT—FRP

If new or different operating conditions or information would substantially affect the implementation of a response plan, the owner/operator must immediately modify the plan to address such a change and, within 30 days of making the change, submit the change to PHMSA. Examples of changes in operating conditions that would cause a significant change to the plan are as follows:

- New pipeline construction or purchase
- Different worst case discharge volume
- Change in commodities transported
- Change in cleanup contractors
- Change in the Qualified Individual(s)

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- Change in an NCP/ACP that has a significant impact on the appropriateness of response equipment or response strategies
- Change in response procedures
- Change in ownership

The QI will incorporate post drill evaluation results and post incident evaluation results into this plan within 90 days. If a worst case discharge occurs on the pipeline, the plan will be evaluated for effectiveness. For substantial harm plans, the plan will be resubmitted to PHMSA every five years from the last plan submission date. For significant and substantial harm plans, the response plan will be submitted to PHMSA every five years from the last approval date. Modifications to the plan will be included on the Revision Record included as **Table 1**. Updated materials will also be submitted to all non-regulatory holders of the plan (refer to **Section 1.3**).

OSHA—ERP

The owner/operator will review the emergency action plan with each employee covered by the plan:

- When the plan is developed or the employee is assigned initially to a job
- When the employee's responsibilities under the plan change
- When the plan is changed

The owner/operator will inform employees upon initial assignment to a job of the fire hazards to which they are exposed. The owner/operator will also review with each employee those parts of the fire prevention plan necessary for self-protection.

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Table 1: Revision Record

Change Number	Change Date	Pages Affected	Description of Change
1	September 2013	pg. 5, 28; Appendix B pg. 5-8	Update SMT
2	October 2013	Quick Reference Guide pg. i; pg. 2-5, 28; Appendix B pg. 2-8	Update SMT and Facility Contacts
3	July 2014	Quick Reference Guide pg. i; pg. 1-5, 15-16, 28, 61, 63; Appendix B	Update NCP/ACP Statement, PHMSA Plan Holder Information, WCD calculations, training records retention period, SMT, Facility Contacts, and Plan Distribution

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1.5 Management Certification

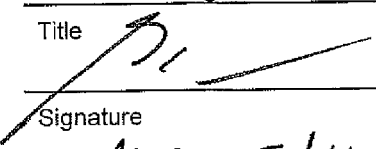
Nautilus Pipeline Company, L.L.C. has developed this plan for the Nautilus Facility to prevent and/or control the spills of oil or hazardous substances. Nautilus Pipeline Company, L.L.C. herein commits the necessary resources to fully prepare and implement this plan and has obtained through contracts the necessary private personnel and equipment to respond, to the maximum extent practicable, to a worst case discharge or substantial threat of such a discharge.

Garry Worone

Certifying Representative (Print)

General Manager

Title


Signature

Aug. 15 / 11

Date

1.6 Plan Custodian

The Plan Custodian is responsible for coordinating the plan's annual reviews and enforcing inspections, training, and exercises; and ensuring the company follows the Regulatory Compliance Schedule, which is located in **Section 1.7**.

Terry McMillin

Plans Custodian - Name (Print)

Sr. EHS Advisor

Title

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1.7 Regulatory Compliance Schedule

The following table is a summary of required drills, training, exercises, reviews and testing.

Failure to meet the requirements of this schedule may lead to Federal and/or State Agency enforcement actions.

Table 2: Regulatory Compliance Schedule

Exercise	Frequency	Participants	Cross Reference
QI Notification Exercise	Quarterly	QI's and Facility Personnel	Section 7.0
QI Training	Annually	QI's	Section 7.0
Spill Management Team (table top) / Simulated Spill Drill*	Annually	SMT, QI's and Oil-handling Personnel	Section 7.0
OSRO Equipment Deployment Exercise	Annually	OSRO	Section 2.8
Facility Equipment Inspections	See Section 6.4	Operator	Section 6.4
Plan Review/Update	Annually	Operator	Section 1.4
Plan Expiration	May 2016	Operator request new plan	Section 1.4

Facility Response Plan Drill Requirement

* In a 3-year period, all components of the response plan must be exercised and at least one drill must include a worst case discharge scenario. Annually, at least one exercise must be unannounced. Unannounced means the personnel participating in the exercise must not be advised in advance of the exact date, time and scenario of the exercise.

Additionally, the owner/operator will participate in unannounced exercises as directed by the lead federal or state agency. The objectives of the unannounced exercises will be to test notifications and equipment deployment for response to the average most probable discharge. After participating in an unannounced exercise the owner/operator will not be required to participate in another unannounced exercise for at least 3 years.

Records of all regulatory compliance items listed above will be generated and maintained by the owner/operator for 3 years. Optional forms are located in **FORMS Appendix**.

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2.0 Information Summary

2.1 Facility Overview

Facility	Owner and Operator
Nautilus Facility	Enbridge Offshore Gas Transmission
215 Nautilus Lane Centerville, Louisiana 70522	195 Equity Boulevard Houma, Louisiana 70360

The Nautilus 30" Gas Pipeline is a FERC regulated interstate offshore pipeline system, operating in the Gulf of Mexico and governed by the requirements of CFR Title 49; Parts 190, 191, 192 and 199 and CFR Title 30; Part 250 Subpart J. Nautilus Pipeline Company, L.L.C. is the Operator of the pipeline and those Nautilus and Manta Ray facilities located at the Garden City Terminal in Centerville, LA. Facility maps and drawings are included in **Appendix A**.

Natural gas and retrograde condensate from the Manta Ray Offshore Gathering Company, L.L.C., (Manta Ray) offshore platform, Ship Shoal 207 DWPF, is delivered into the Nautilus Pipeline Company, L.L.C. (Nautilus) 30" Gas Pipeline. The Nautilus 30" Gas Pipeline is approximately 99.5 miles in length and terminates at the Nautilus Garden City Terminal. Natural gas flows through the Manta Ray slugcatcher at the Garden City Terminal, allowing condensate liquids to be separated from the gas stream. The gas stream is then metered and delivered to the Neptune Gas Plant for processing. Processed gas is then delivered to the Nautilus Plant Discharge Facility (PDF) for metered delivery to connecting gas pipelines. The OCS-G-17044 (b) (7)(F), (b) (3)

The 30" mainline continues north at the Louisiana State Waters Line located in Eugene Island 19 and extends to a directionally drilled shoreline crossing in East Cote Blanche Bay. The 30" mainline then extends from the directionally drilled shoreline crossing known as the South Burns Drill Site to the manifold area at Burns Point, St. Mary Parish, and Louisiana. On exit of the manifold, the mainline enters a second directionally drilled shoreline crossing, known as the North Burns Drill Site. The mainline then continues northward in East Cote Blanche Bay to a third directionally drilled shoreline crossing known as the Gordy Drill Site. The onshore portion of the 30" mainline extends from the Gordy Drill Site to the Nautilus Garden City Terminal.

The Nautilus Pipeline is covered under one response zone in St. Mary Parish, Louisiana. Products listing and MSDS are available in **Appendix D**.

2.1.1 Nautilus Mainline

Nautilus consists of 30" O.D., API 5L-X65, DSAW pipe. Two hundred seventeen pound, AL/In/Zn sacrificial anode bracelets are installed at 600' increments. The pipeline was installed during the spring and summer of 1997. The water depth range from Ship Shoal 207 to Eugene Island 79 is approximately 106 to 16 ft. The water depth at the State Water/Federal Water boundary is approximately 6 ft. The water depth at the South Burns Point directional drill is approximately 5 ft.

(The pipeline stationing used for the onshore portion is from the C&C Technologies alignment sheets, and the stationing for the offshore section thru the Gordy drill site is from the Marathon alignment sheets.)

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Table 3: Pipeline Data Table

Stationing	Wall Thickness & Coating	Concrete	Location/Water Depth	Contractor	AFE#
(b) (3), (b) (7)(F)	0.875" & ½" Splashtron	None	(b) (7)(F), (b) (3)	McDermott	2920
	0.875" & 16 mils FBE	1.5" 190 PCF		McDermott	2920
	0.577" & 16 mils FBE	2.5" 190 PCF		McDermott	2920
	0.577" & 16 mils FBE	2.75" 190 PCF		McDermott	2920
	0.577" & 16 mils FBE	2.75" 190 PCF		HBH	2921
	0.577" & 16 mils FBE	2.75" 190 PCF		HBH	2922
	0.750" & 16 mil FBE	None		Broussard & Laney	2923
	0.577" & 16 mils FBE	2.75" 190 PCF		Broussard	2923
	0.750" & 16 mil FBE	None		Broussard & Laney	2923
	0.577" & 16 mils FBE	2.75" 190 PCF		Broussard	2923
	0.469" & 16 mils FBE	2.75" 190 PCF		Rogers & Phillips	2924
	0.577" & 16 mils FBE	None		Rogers & Phillips	2924
	0.469" & 16 mils FBE	2.75" 190 PCF		Rogers & Phillips	2924
	0.750" & 16 mil FBE	None		Rogers & Phillips	2924
	0.469" & 16 mils FBE	2.75" 190 PCF		Rogers & Phillips	2924
	0.577" & 16 mils FBE	None		Rogers & Phillips	2924
	0.469" & 16 mils FBE	2.75" 190 PCF		Rogers & Phillips	2924
	0.577" & 16 mils FBE	None		Rogers & Phillips	2924
	0.469" & 16 mils FBE	2.75" 190 PCF		Rogers & Phillips	2924
	0.577" & 16 mils FBE	None		Rogers & Phillips	2924
	0.469" & 16 mils FBE	2.75" 190 PCF		Rogers & Phillips	2924
	0.577" & 16 mils FBE	None		Rogers & Phillips	2924
	0.469" & 16 mils FBE	2.75" 190 PCF		Rogers & Phillips	2924
	0.577" & 16 mils FBE	None		Rogers & Phillips	2924
	0.469" & 16 mils FBE	2.75" 190 PCF		Rogers & Phillips	2924

The system was hydrostatically tested upon completion of co

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No instrument pigs have been run to date.

Pressure data: Minerals Management Service (MMS) permit for the offshore portion of the Nautilus 30" Gas Pipeline lists the pipeline with a MAOP of 1800 psig; however, the onshore portion, on the downstream side of AOV-2002, has an MAOP of 1440 psig, as it contains ANSI 600# fittings and appurtenances.

SS207 Riser Installed by Shell

OCS-G-17044, Segment 11217

Test Record #: 370

Min. Hydrostatic Test Pressure: 2705 psig

Year Tested: 1997

Flange Rating: ANSI 900#

MAOP: 1803 psig (but limited to 1799 psig)

AFE: NA

Launcher at SS207 Installed by Shell

OCS-G-17044, Segment 11217

Test Record #: 369

Min. Hydrostatic Test Pressure: 2705 psig

Year Tested: 1997

Flange Rating: ANSI 900#

MAOP: 1803 psig (but limited to 1799 psig)

AFE: NA

SS 207 to Burns Point (flange upstream of AOV 2001):

OCS-G-17044, Segment 11217

Test Record #: 364

Min. Hydrostatic Test Pressure: 2249 psig

Year Tested: 1997

Flange Rating: ANSI 900#

MAOP: 1799 psig

AFE: 2920, 2921, 2922, 2923

Burns Point Manifold (ANSI 900# Piping)

OCS-G-#NA

Test Record #: 365

Mn. Hydrostatic Test Pressure: 2725 psig

Year Tested: 1997

Flange Rating: ANSI 900#

MAOP: 2477 psig (but limited to 1799 psig)

AFE: 2923

Burns Point Manifold (ANSI 600# Piping)

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OCS-G-#NA

Test record #: 366

Min. Hydrostatic Test Pressure: 2185 psig

Year Tested: 1997

Flange rating ANSI 600#

MAOP: 1986 psig (but limited to 1463 psig internal pressure of 0.469" wall)

AFE: 2923

North Burns to Gordy

OCS-G-#NA

Test Record #: 367

Min. Hydrostatic Test Pressure: 2290 psig

Year tested: 1997

Flange Rating ANSI 600#

MAOP: 1832 psig (but limited to 1463 psig internal pressure of 0.469" wall)

Gordy to Garden City

OCS-G-#NA

Test Record #: 368

Min. Hydrostatic Test Pressure: 1830 psig

Year tested: 1997

Flange Rating ANSI 600#

MAOP: 1664 psig (but limited to 1463 psig internal pressure of 0.469" wall)

Sidetap Assemblies: None

Foreign Pipeline Crossings:

The foreign pipeline crossings are maintained in Enbridge's Houston office.

2.1.2 Responsibilities

The operations and maintenance activities for the Nautilus 30" Gas Pipeline are performed by the Houma area personnel under the direction of the Houma Area Manager. Pipeline integrity monitoring is conducted by the Enbridge Houston Gas Control (HGC) group located in Houston, TX.

2.1.3 Start-up Procedures

Action 1:

- Operations and HGC will verify and coordinate start-up / shutdown time(s) with all appropriate customers. Customers include Enbridge Offshore (Gas Transmission) L.L.C. (EOGT), Ship Shoal 207 Operator, Neptune Plant, and flowing PDF customers.

Action 2:

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- Operations and HGC will verify and coordinate start-up / shutdown time(s) and nominated amounts to assure that all the valves which the field is responsible for operating are in the appropriate position so the pipeline can be started / shutdown.

Action 3:

- Commence start-up / shutdown activities as per written operating procedures.

2.1.4 Abnormal Operating Conditions

Abnormal conditions are unexpected, unintentional, non-emergency events that cause a pipeline system's normal operating limits to be exceeded. In some instances, these abnormal conditions can be the early stages of a pipeline emergency.

Abrupt Pressure Change

HGC constantly monitors (24 hrs/day) the 30" pipeline operating parameters and will notify operations of abnormal pressure changes in the system that may cause high/low pressure sensors to shutdown the pipeline. HGC also has the ability to adjust flows on the pipeline system to resolve and stabilize potential shut-in pressures.

Volume Discrepancy

HGC monitors the combined net flow rate and pressures from SS207 and Garden City.

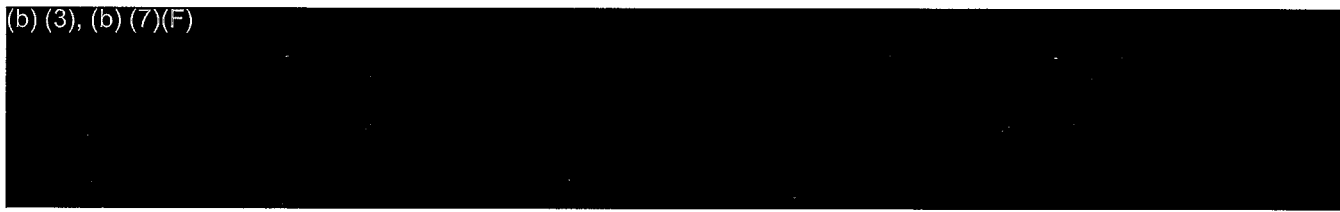
Damage Report

Should a third party report damage to the Nautilus 30" Gas Pipeline, the exact location and problem should be transmitted to the HGC who will contact operation's personnel and if appropriate the Qualified Individual.

Notification of Adjacent Pipeline or Platform Operators

Adjacent pipeline or platform operators will be notified by Enbridge personnel when judged appropriate.

(b) (3), (b) (7)(F)



Abnormal Main Line Operating Pressures ("Line Pack")

The Nautilus 30" Gas System utilizes a pressure limiting design to provide over-pressure protection for the lower MOP piping and facilities at Garden City. As such, there are no main line or manifold pressure relief valves on the incoming piping at Garden City. Therefore, it is critical that abnormal operating pressures which result on the main line are managed within the maximum operating pressure limitations of both the main line and station piping.

The pressure limiting devices on the main line system are as follows:

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Location	Device	Facilities Protected
Ship Shoal 207	SDV 8036	SS 207 – Burns Point Line Segment
Burns Point	AOV 2001	Burns Point – Garden City Line Segment Garden City Incoming Station Piping
Burns Point	AOV 2002	Burns Point – Garden City Line Segment Garden City Incoming Station Piping

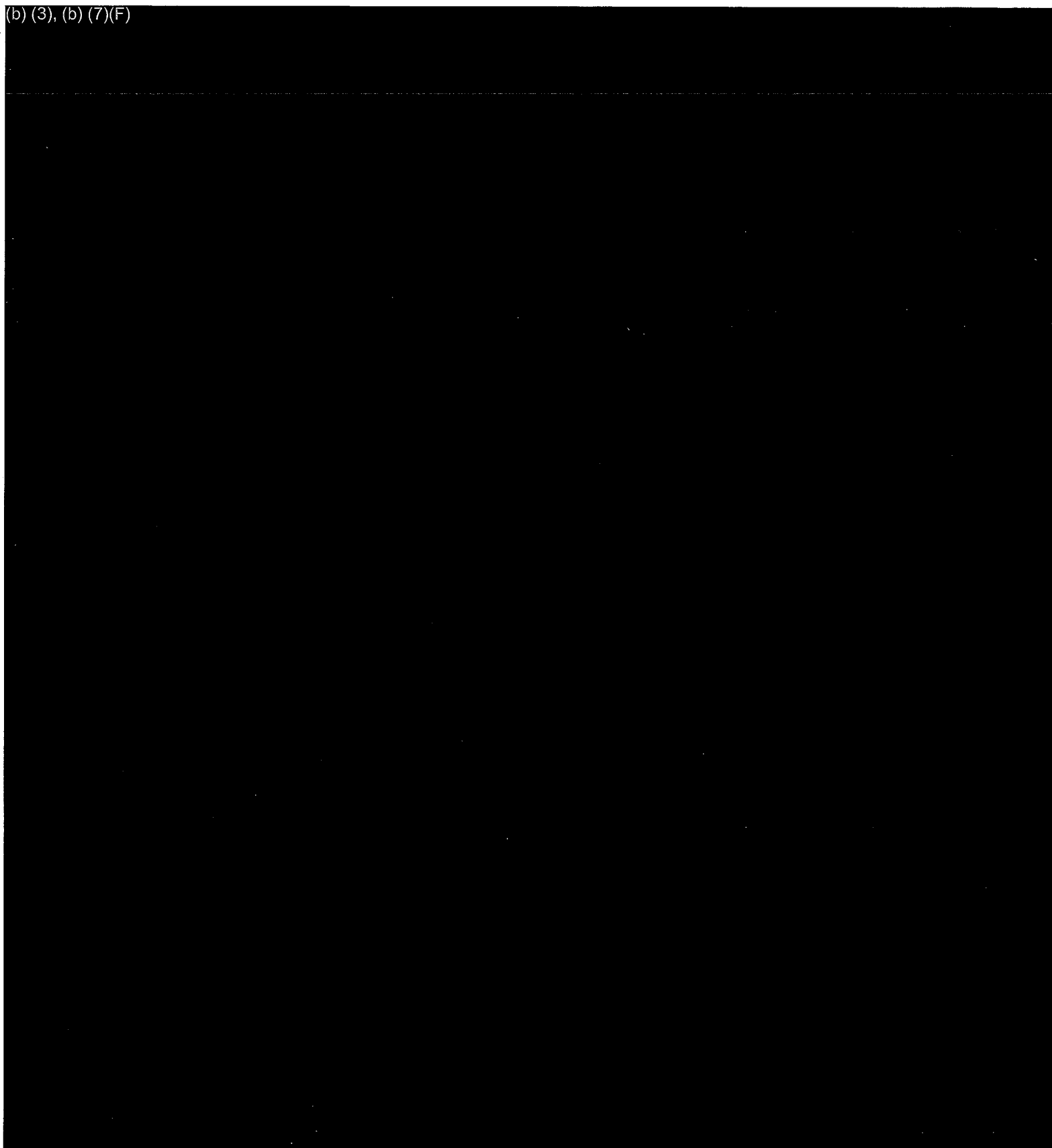
Note: Refer to the System Pressure Control Set Point Table to verify the device set points.

(b) (3), (b) (7)(F)



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(b) (3), (b) (7)(F)



(b) (3), (b) (7)(F)

Valve Name	Valve Number	Location
(b) (7)(F), (b) (3)		

2.1.5 Security Policy

(b) (7)(F), (b) (3)

The QI have the responsibility and authority to initiate spill cleanup operations, obligate funds to carry out response activities, and act as liaison with the pre-designated Federal On-Scene Coordinator (FOSC). QI and alternates are listed in **Appendix B**, along with their 24-hour contact information.

Qualified Individual	Office	Mobile (24Hrs)	Home
Mark Poteet	(832) 214-9499	(b) (6)	
Fred Whitted	(713) 821-1219		

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2.3 Significant and Substantial Harm Determination

In accordance with §194.103, a line section can be expected to cause significant and substantial harm to the environment in the event of a discharge of oil into or on the navigable waters or adjoining shorelines if; the pipeline is greater than 6 5/8 inches (168 millimeters) in outside nominal diameter, greater than 10 miles (16 kilometers) in length, and the line section:

- 1) Has experienced a release greater than 1,000 barrels (159 cubic meters) within the previous five years,
- 2) Has experienced two or more reportable releases, as defined in §195.50, within the previous five years,
- 3) Contains any electric resistance welded pipe, manufactured prior to 1970, operates at a maximum operating pressure established under §195.406 that corresponds to a stress level greater than 50 percent of the specified minimum yield strength of the pipe,
- 4) Is located within a 5 mile (8 kilometer) radius of potentially affected public drinking water intakes and could reasonably be expected to reach public drinking water intakes, or
- 5) Is located within a 1 mile (1.6 kilometer) radius of potentially affected environmentally sensitive areas, and could reasonably be expected to reach these areas.

The Nautilus Pipeline can be expected to cause significant and substantial harm based on criterion numbers 4 and 5 above. Refer to **Appendix A** for a facility overview map and the Environmental Sensitivity Index Maps showing the locations of public drinking water intakes and environmental sensitivities.

2.4 Transfers and Throughputs

The average daily throughput volume of crude oil is 50 bbl/day.

2.5 Worst Case Discharge

There are no breakout tanks, nor have there been any discharges from this pipeline that would affect the Worst Case Discharge.

(b) (7)(F), (b) (3)



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2.6 Emergency Response Equipment

2.6.1 Signs

The facility will maintain a sign or placard in a prominent location that states that the GLO and NRC are to be notified in the event of an oil spill. The sign will also include the 24-hour phone numbers for these agencies.

2.6.2 Communications Equipment

Two UHF handheld radio communication systems (intrinsically safe) and cellular phones will be utilized in case of an emergency. The operator will exchange radios with the OSRO and/or SMT during the incident. This will enable the SMT to communicate with spill response team members by radios tuned to designated frequencies.

2.6.3 Oil Spill Response Equipment

The operator does not own or maintain oil spill response equipment. This location has been determined to be reasonably accessible to areas of environmental vulnerability in the event of an emergency and secure from acts of vandalism or theft. OSROs are under contract to provide response equipment and personnel in the event of an unauthorized discharge (refer to **Section 2.8**).

2.6.4 Firefighting Equipment

The operator maintains firefighting equipment throughout the facility. This equipment will only be utilized if safe to do so. **Appendix A** includes a diagram showing the locations of all extinguishers.

2.7 Discharge Response Scenario

2.7.1 Chronology of Events

Worst Case Discharge

0730: After a hurricane, an operator flying over the facility discovers a sheen on the water in the area of the Nautilus Pipeline. The leak (b) (7)(F), (b) (3) is traced back to the pipeline and it is shutdown.

0740: The operator notifies the Qualified Individual (QI), who in turn notifies O'Brien's Response Management, the contracted Spill Management Team (SMT).

0815: The IC calls out selected members of the Spill Management Team (SMT).

0845: The Planning Section Chief surveys the area within the 5-mile planning distance and determines that, given the size of the spill, the following sensitive areas are at risk: Bayou Sale Bay and the associated shorelines.

0900: The Operations Section Chief contacts the contracted OSRO, Clean Harbors Environmental Service, and requests 2 vacuum trucks, 1200' of containment boom, 2200' of sorbent boom, 800' of snare, and 50 bundles of sorbent pads.

0915: Clean Harbors Environmental Service informs the Operations Section Chief that they will deploy equipment and personnel from their New Iberia location and that they will be onsite in one hour.

However, given the amount of equipment requested, it may take several hours for all equipment to arrive at the facility.

1000: Clean Harbors Environmental Service equipment begins to arrive at the facility with 4 truck drivers (2 vacuum, 2 equipment), 8 techs, and 1 supervisor. It will take an estimated 2 hours for the remaining equipment to arrive.

1015: Cleanup operations begin utilizing vacuum trucks and sorbents. Technicians begin inspecting the areas around the facility to determine locations of greatest concern.

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1035: Clean Harbors Environmental Service informs the SMT that the sheen is heaviest on the northeast side of Bayou Sale Bay.

1105: Based on the Planning Section's analysis and recommendation to protect Bayou Sale Bay and the associated wetlands, the Operations Section Chief instructs the OSRO to deploy containment boom around the sheen.

1130: To collect oil and reduce the probability of the sheen escaping containment, Clean Harbors Environmental Service lines the inside of the hard boom with sorbent boom.

1140: Additional Clean Harbors Environmental Service response equipment arrives (2 trucks, 2 drivers).

Days 2-9

The Planning Section continues to gather environmental data, which is used to establish the daily Incident Action Plan.

Day 10

0830: All generated waste is collected by response personnel properly.

0920: Clean Harbors Environmental Service leaves the facility transporting the oily waste for disposed.

Day 11

0400: The IC convenes an incident summary meeting with the SMT members and Qualified Individual.

2.8 Oil Spill Contractors

O'Brien Response Management Inc. (O'Brien's) is the contract Spill Management Team, while Clean Harbors Environmental Service is under contract as the primary provider of spill response equipment and personnel. Clean Harbors Environmental Service is a USCG-Certified OSRO and is available 24/7 to respond to a worse case discharge to the maximum extent practicable.

The OSROs are relied upon for equipment and staffing. The OSRO classification also serves as acceptable documentation of an equipment testing program. For non-classified spill contractors, the operator has insured that such contractors have a maintenance program established for their equipment. Contact information for spill contractors is included below, while information on services agreements is included in **Appendix C**.

Contractor	Phone	Response Time
O'Brien's Response Management (O'Brien's)	(985) 781-0804	30 min.
Clean Harbors Environmental Service	(800) 645-8265	1 hr.
ES&H	(888) 422-3622	1 hr.
Ampol	(800) 482-6765	1 hr.

2.9 Response Zones

The 'facility' is covered under a single response zone for St. Mary Parish, Louisiana. The DOT, PHMSA regulations require that the operator identify response resources which are available to respond within specified timeframes following discovery of a worst case discharge, or to mitigate the substantial threat of such a discharge. The specified timeframes are as follows:

	Tier 1	Tier 2	Tier 3
(b) (7)(F), (b) (3)			

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The facility does not qualify as a "high volume area", therefore, all response resources will follow those timeframes specified for "all other areas". OSROs are under contract and committed to respond to all pipeline sections within the 12-hour, Tier 1 timeframe.

Clean Harbors Environmental Service is under contract as the primary service provider, and is committed to respond to all pipeline sections within the 12-hour, Tier 1 timeframe. Additional contractors are available, as necessary, to fulfill Tier 2 and Tier 3 time requirements (refer to **Section 2.8**).

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3.0 Core Plan Elements

3.1 Abnormal Operating Conditions

(Develop this section based on what the facility has in place.....some of the following language for pipelines may be helpful)

The pipeline is protected by high/low pressure devices. The pipeline is monitored 24 hours per day by ???. The Operations Manager is responsible for leak detection along the pipeline. The procedures used to prevent and quickly detect spills are described in the facility's Operating and Maintenance (O&M) manual. In addition to the electronic monitoring system, leaks or ruptures are located by routine pipeline inspections. Pressure recording charts, pressure gauges, meters, communication equipment and safety devices will be observed for indications of abnormal operations. All abnormal operations will be documented on the Abnormal Incident Report form included in **FORMS Appendix**.

Abnormal conditions are unexpected, unintentional, non-emergency events that cause a pipeline system's normal operating limits to be exceeded. In some instances, these abnormal conditions can be the early stages of a pipeline emergency. Abnormal operations may include the following:

- Unintended closure of valves or shutdowns
- Increase or decrease in pressure or flow rate outside normal operating limits
- Operation of safety devices
- Loss of communications
- Any other malfunction of a component, deviation from normal operation, or personnel error which could cause a hazard to persons or property

3.1.1 Unintended Valve Closure or Shutdown

In the event of unintended valve closure or shutdown, the operator will immediately evaluate the condition, to see if an increase in pressure over the MOP occurred. If such an increase occurred, the line will be shut in, and pressures monitored to determine whether the line integrity has been violated. If the monitoring of line pressure indicates a potential leak or rupture, the Operations Manager will be notified immediately. Once the cause has been determined, a minimum of one hour of pressure monitoring will be completed. If the pressure readings indicate that line integrity has been maintained, and the problem has been identified and corrected, the line may be restarted with concurrence from the Operations Manager. If an increase over MOP did not occur, the line operation may continue, provided the cause of the valve closure or shutdown has been determined and corrected.

3.1.2 Pressure or Flow Rate Readings Outside Normal Operating Limits

In the event that pressure or flow rate readings are outside of the normal operating limits, the readings will be checked against the design limits of the line. If the readings exceed the design limits, the line will be shut in immediately. Pressure will be monitored to determine that the line integrity has not been violated. If the monitoring of line pressures indicates a potential leak or rupture, the Operations Manager will be notified immediately. Once the cause has been determined, a minimum of one hour of pressure monitoring will be completed. If the pressure readings indicate that line integrity has been maintained, and the problem has been identified and corrected, the line may be restarted with concurrence from the Operations Manager. If the readings did not exceed the design limits of the line, operations may continue.

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3.1.3 Operation of Safety Devices

If any safety device is triggered, the operator will immediately notify the Facility Operator. An investigation will then be conducted to determine the cause of the problem. After the problem has been corrected, the line will be evaluated to determine whether or not the design limits were exceeded. If the design limits were exceeded, operators will follow the appropriate procedures outlined in the facility's O&M manual. If pressure readings indicate that line integrity has been maintained, and the problem has been identified and corrected, the line may be restarted with concurrence from the Operations Manager. If the design limits of the line were not exceeded, the pipeline operation will continue providing the safety condition has been corrected.

3.1.4 Loss of communications

If the field personnel determine that there is a loss of communications, he/she will immediately notify the Facility Operator. The operating conditions will be evaluated to see if the loss in communications causes any threat to the safety of the operation. The Facility Operator will notify the appropriate Operations Manager that communications have been lost. There are redundant communications systems at the facility. In the event one system fails, notification will still be possible.

If the loss of communications has the potential to cause a threat to the safety of the operation, the line will be shut down immediately. When communications are restored, the Facility Operator will be notified and normal operations will continue. If the line was shutdown, it will be restarted per the normal start-up procedures.

3.1.5 Other Malfunctions/Deviations/Personnel Error

The Operations Manager will evaluate all other conditions and determine a course of action to be taken.

3.2 Preliminary Assessment

Evaluate safety considerations through the following actions:

- Perform air monitoring surveys prior to entering a spill area
- Approach area wearing protective equipment, including breathing apparatus if uncertain of product spilled
- Keep the public a safe distance from the spill area
- Avoid contact with spilled product
- Secure the release if possible to do so in a safe manner (e.g. close valve, turn off pump, blind the flange)
- Contain the release with sorbent material, loose dirt, sandbags, or other materials that are available
- Be aware of conditions such as high currents, poor visibility, or inclement weather which may cause undue personnel hazards during boating operations
- Identify safety hazards involved in handling spilled oils such as:
 - Extremely slippery walking surfaces
 - Physical hazards associated with spilled product including, but not limited to, skin irritation (from skin contact), diarrhea (from ingestion), eye irritation (from exposure to vapors), dizziness (from inhalation), nausea (from inhalation or ingestion), and asphyxiation (from inhalation)
- Determine extent and movement of the spill
- Identify sensitive areas and determine protection priorities

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3.3 Initial Response

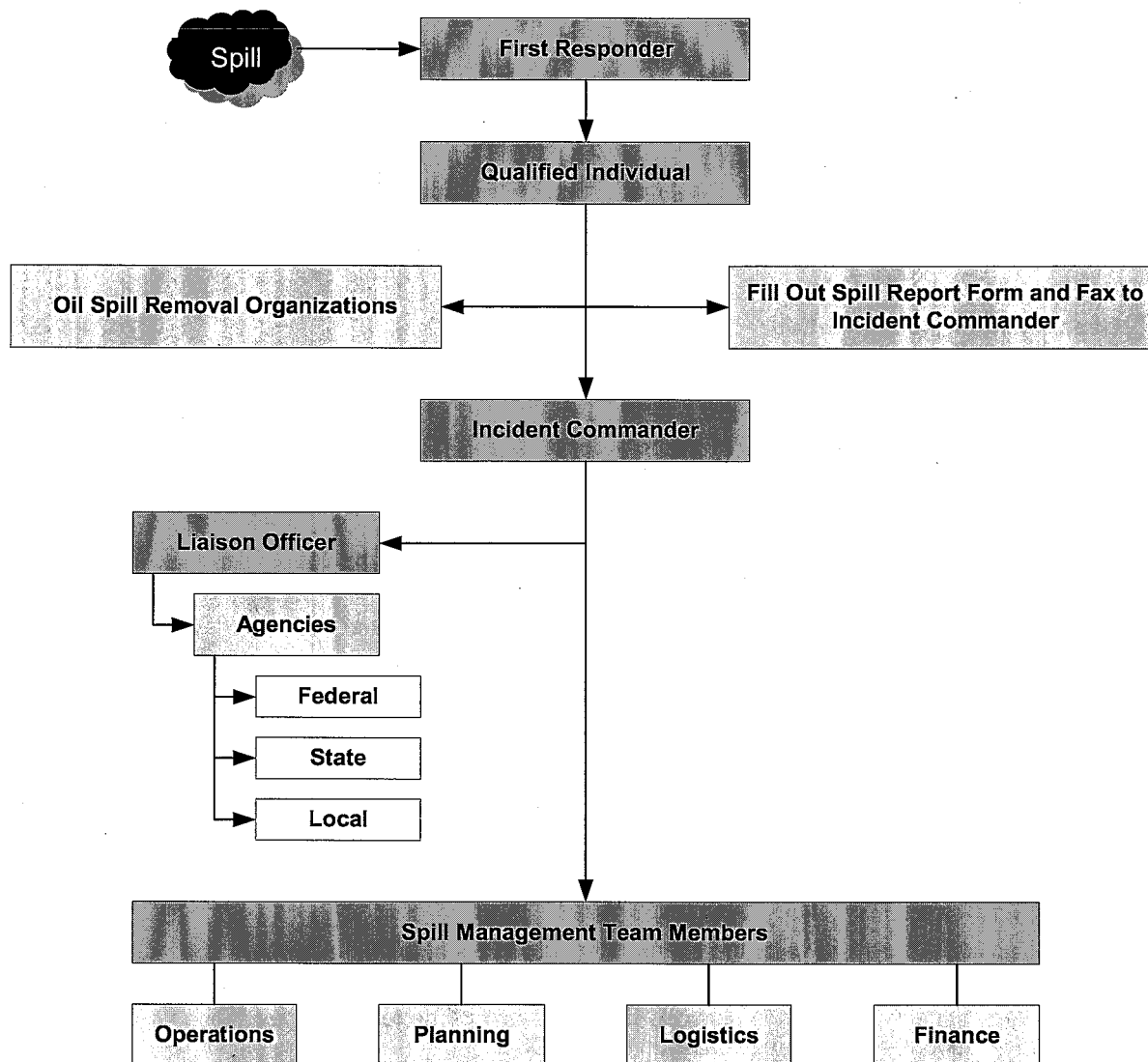
Any person observing or becoming aware of an oil spill of any size must immediately report the incident to the Qualified Individual (QI). The Spill Report Form (**FORMS Appendix**) will be completed while discussing the incident. Information not immediately known may be added to the form as it becomes available. Operations personnel are capable of initiating notifications on a 24-hour basis. Notification will take place as indicated in **Figure 1**, Spill Notification Flowchart. When making these initial notifications, personnel should attempt to provide the following information:

- Name of caller and callback number
- Exact location and nature of the incident (e.g., fire, release)
- Time of incident
- Name and quantity of material(s) involved, or to the extent known (refer to MSDS)
- The extent of personal injuries, damage and/or fire, if any
- The possible hazards to human health, or the environment, outside the facility;
- Body of water affected (if any)
- If applicable, quantity in water (size and color of slick or sheen if the material is lighter than water) or amount released to the atmosphere
- Present weather conditions—wind speed and direction, movement of slick or sheen, current/tide;
- Potential for fire
- Action being taken to control release.
- Contact information for all points of notification is included in **Appendix B**.

Detergents or other surfactants are prohibited from being used on an oil spill in the water, and that dispersants may only be used with the approval of the Regional Response Team.

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Figure 1: Spill Notification Flowchart



*SMT and QI information are located in **Appendix B**.

*Spill Report Form is located in **FORMS Appendix**.

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3.3.1 Federal Agency Notification Requirements

The Incident Commander will notify the Liaison Officer, who will in turn make all initial and follow-up federal agency notifications on a 24-hour basis. Agencies will be notified in the order established in this section.

National Response Center (NRC)

(800) 424-8802

The NRC is the clearinghouse for all USCG and USDOT oil and chemical spill notifications. Placing a call to the NRC satisfies the notification requirements for each of these agencies. Immediate notification (less than one hour) is required for all discharges of oil sufficient to produce a sheen into navigable waters of the United States, and for all chemical releases in excess of the reportable quantities listed in 40 CFR 302.4. Below are the reporting requirements for each agency, along with the agency's telephone number.

U.S. Department of Transportation

(800) 424-8802

The following notification requirements apply if NRC has not already been contacted.

The DOT must be notified by telephone if an incident:

- Caused a death or a personal injury requiring hospitalization.
- Resulted in either a fire or explosion not intentionally set by the operator
- Caused estimated damage to the property of the operator or others, or both, exceeding \$50,000.
- In the judgment of the operator was significant even though it did not meet the criteria above.
- Resulted in pollution that violated applicable water quality standards, caused discoloration of the water surface or shoreline, or deposited a sludge or emulsion in the shoreline or beneath the water surface (195.52).

For reportable incidents, the Liaison Officer shall telephone the NRC at the earliest practicable moment, with the following information:

- Operator of pipeline and their telephone number.
- Name and telephone number of the person reporting the incident.
- Location of the accident.
- Time of the accident.
- Fatalities or personal injury, if any.
- All other significant facts known by the operator that are relevant to the cause of the incident or extent of the damages.

Additionally, if additional information is obtained that leads any of the following deviations from the initial report, then an additional report must be called in to the FOSC:

- An increase or decrease in the number of previously reported injuries or fatalities
- A revised estimate of the product release amount that is at least 10 times greater than the amount reported
- A revised estimate of the property damage that is at least 10 times greater than the reported property damage estimate

A written report (DOT PHMSA Form 7100.2) is due as soon as practicable but not more than 30 days after discovery of the incident.

3.3.2 State Agency Notification Requirements

The Incident Commander will notify the Liaison Officer, who will in turn make initial and follow-up state agency notifications. Coordination will take place among the groups listed within this section.

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Louisiana One-Call (State Police)**(225) 925-6595**

Spills that meet the requirements specified by either state or federal Right-to-Know Laws must be reported immediately (within one hour). A written report is required within five business days.

The Louisiana State Police must be notified of any actual or threatened discharge involving one or more barrels of petroleum material, or an amount that exceeds the reportable quantity of hazardous material, into the water or onto land. The Office of the State Police is the lead agency for emergency response in Louisiana. Continue to report any material changes (that is, quantity, quality, location of the discharge) prior to the arrival of a State On-Scene Coordinator.

Louisiana Department of Environmental Quality**(225) 342-1234**

The Louisiana Department of Environmental Quality (DEQ) must be notified of any actual or threatened discharge involving one or more barrels of petroleum material, or an amount that exceeds the reportable quantity of hazardous material, into the water or onto land. The DEQ division that handles this notification is the Office of Water Resources. Continue to report any material changes (that is, quantity, quality, location of the discharge) prior to the arrival of a State On-Scene Coordinator. Within seven calendar days following the verbal report, a written report will be submitted.

Louisiana Oil Spill Coordinator**(225) 219-5800**

Notify the Louisiana Oil Spill Coordinator within one hour of any spill that threatens state waters.

3.3.3 Local Agency Notification

The Incident Commander will notify the Liaison Officer, who will in turn make the initial and follow-up notification to the following Parish Office of Homeland Security (OHS) & Emergency Preparedness and or Local Area Planning Committee (LEPC):

St. Mary Parish**(985) 385-2600****3.3.4 Community Notifications**

In the event that community notification of a spill is required, the police departments can be reached immediately on a 24-hour basis by dialing "911." Other Community notifications include:

- Local Fire Department
- Local radio and television stations (for broadcasting messages to the public)

Contact information for community points of notification is included in **Appendix B**.

In the event that public notification of a spill is required, as deemed necessary by the Federal On-Scene Coordinator, the following guidelines will be noted:

- The nature and extent of the economic losses that have occurred or are likely to occur
- The persons who are likely to incur economic losses
- The geographical area that is affected or is likely to be affected
- The most effective method of reasonably notifying potential claimants of the designated source
- Any relevant information or recommendations submitted by the owner, operator, or guarantor of the designated source

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3.3.5 Other Notifications

There are a number of other notifications that must be made if the incident is of a sufficient magnitude. These include:

- OSROs (available 24/7)
- Wildlife rehabilitation personnel
- Natural Resource Damage Assessment (NRDA) experts

Contact information for these points of notification is included in **Appendix B**.

3.4 Establishment of a Response Management System

Prior to the arrival of the contracted Incident Commander (IC), the Facility Operator will be the acting IC during a response. As the incident escalates, more personnel will be called in to form an Incident Command System. The National Incident Management System (NIMS) will be used by the facility, in concert with OSROs and federal, state and local agencies. A full discussion on the facility's ICS can be found in **Section 4.0**.

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4.0 Response Management System

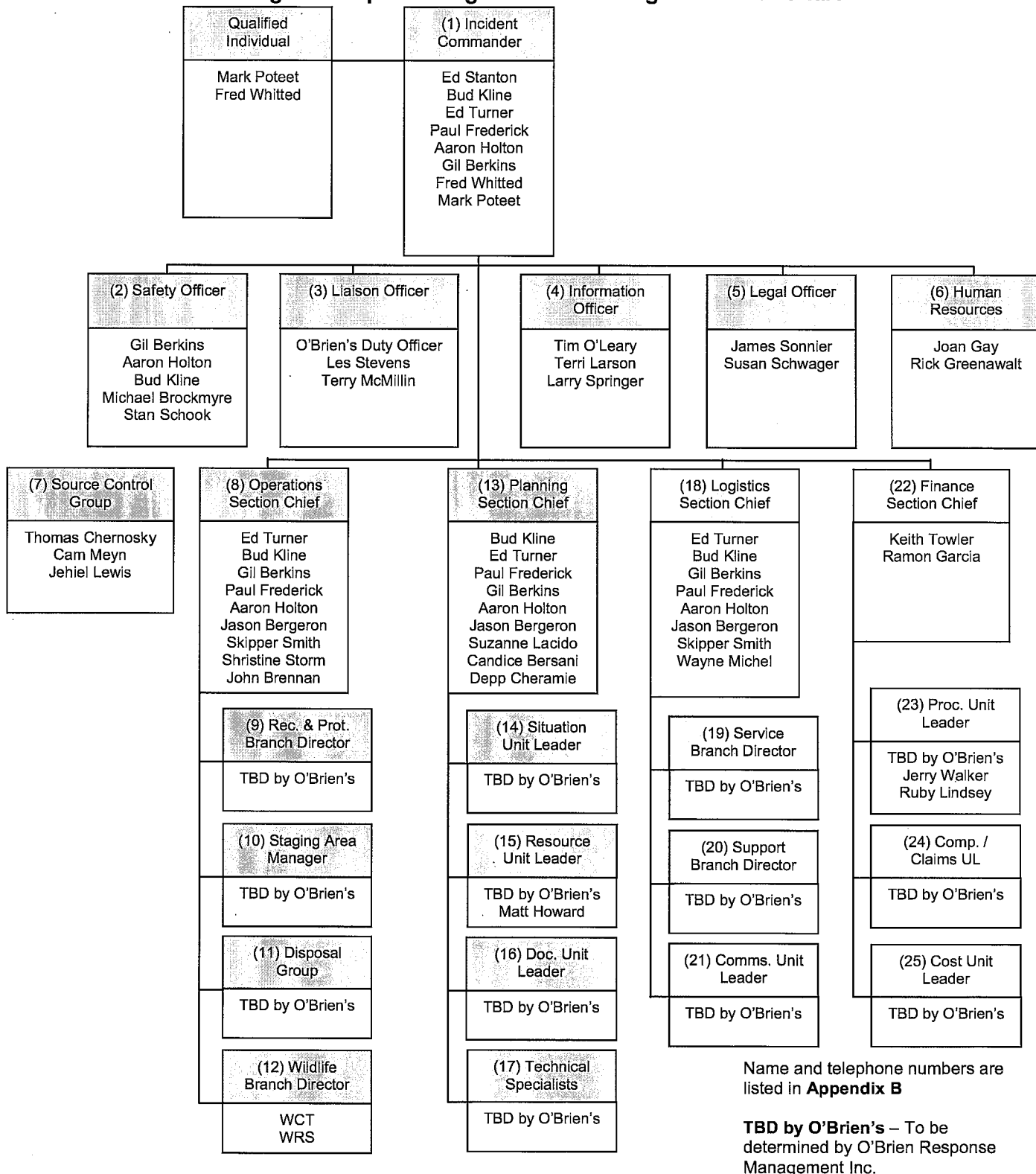
4.1 General

The Spill Management Team (SMT) has been created and organized to plan for and manage response operations. The organizational structure of the Spill Management Team (SMT) is based on National Incident Management System (NIMS) Incident Command System (ICS). The structure of the Team is modular. A portion of the team may be utilized during a small incident or the entire team may be utilized during a large incident (depending on the size of the environmental impact).

The SMT will develop strategies and priorities for a response, supervise contractors, handle safety and security matters, and provide logistical support for contractor personnel. The SMT will handle all communications with the media and the public. An SMT organizational chart is included as **Figure 2**, while specific duties of various divisions of the SMT are described in **Figure 3**. The Incident Commander (IC) will determine the extent of the SMT utilization, depending upon circumstances present. SMT contact information is included in **Appendix B**.

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Figure 2: Spill Management Team Organizational Chart

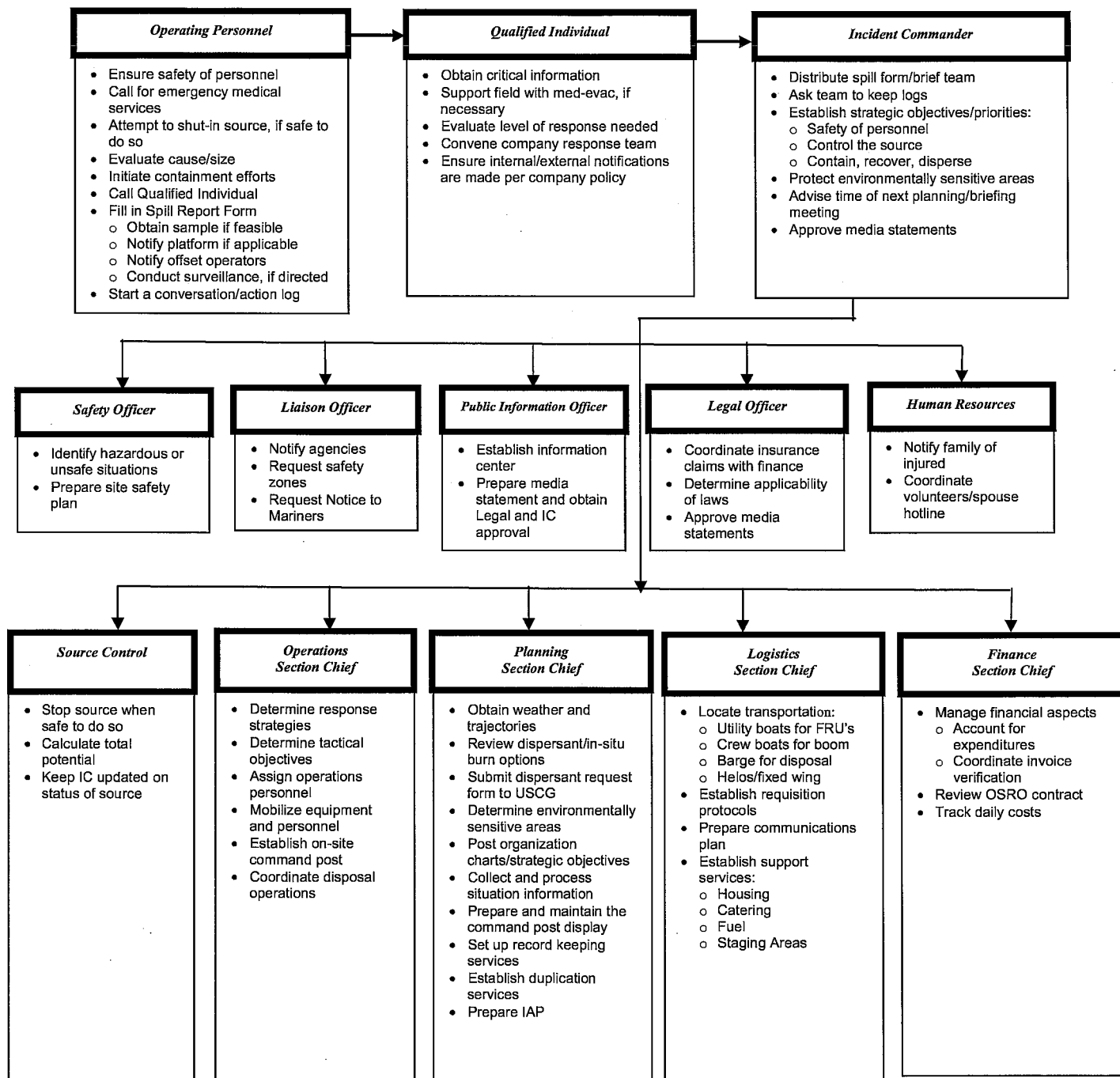


Additional SMT role necessity and designation will be determined at the time of the incident.

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Figure 3: Spill Management Team Duties

Activity Checklists for various members of the SMT have been included in Appendix F.



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4.2 Interface with Federal, State, and Local Agencies

The Unified Command Structure will be utilized as a method of integrating federal, state, and local agencies with the SMT. The purpose of this system is to organize the variety of agencies that may be involved in a response into a consistent team that performs their duties in a concerted, unified effort.

The Unified Command Structure consists of three key on-scene coordinators: Federal On-Scene Coordinator (FOSC), State On-Scene Coordinator (SOSC), and the Incident Commander (IC). These three entities will share decision-making authority as Incident Commanders in the Command center and will consult with each other regarding spill response management issues. The SOSC will coordinate all state and local agencies involved in the response. The facility's Qualified Individual will coordinate all facility personnel and contract activities.

Depending upon the size and complexity of the incident, additional federal and state agency personnel may integrate into the other functions of the SMT.

4.3 Spill Management Team (SMT)

4.3.1 Duties

Command and Control

Prior to the arrival of the Incident Commander (IC), the Facility Operator will assume the position of IC. If the Facility Operator is absent, this position will be assumed by the Emergency Team Captain. The Incident Commander will be responsible for setting up the Command Post, start carrying out command activities, approving and authorizing the Incident Action Plan (IAP), authorizing the release of information, and ensuring response fund availability. All emergency control activities will be coordinated from the Command Post. The Command Post will be a facility (vehicle or building) with adequate communication equipment, resource information, lighting, space for staff, etc.

The *Command Staff* will consist of the Incident Commander, Safety Officer, Liaison Officer and Public Information Officer, and other management staff as necessary or as requested.

Incident Commander

The Incident Commander will ensure that all of the following duties are successfully performed in a safe manner:

- Activate internal alarms and hazard communication systems to notify all facility personnel.
- Notify all response personnel, as needed. Identify the character, exact source, amount, and extent of the release, as well as the other items needed for notification.
- Notify and provide necessary information to the appropriate Federal, State, and local authorities with designated response roles, including the National Response Center, State Emergency Response Commission, and Local Emergency Planning Committee.
- Assess the interaction of the spilled substance with water and/or other substances and notify response personnel at the scene of that assessment.
- Assess the possible hazards to human health and the environment due to the release. This assessment must consider both the direct and the indirect effects of the release (i.e., the effects of any toxic, irritating, or asphyxiating gases that may be generated, or the effects of any hazardous surface water runoffs from water or chemical agents used to control fire and heat-induced explosion).
- Assess and implement prompt removal actions to contain and remove the substance released.
- Coordinate rescue and response actions as previously arranged with all response personnel.

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- Use authority to immediately access company funding to initiate cleanup activities.
- Direct cleanup activities until properly relieved of this responsibility.

The *Qualified Individual* has authority to immediately access company funds to initiate cleanup activities. In the event that major cleanup activity funding is needed, corporate notification and involvement would facilitate the immediate accessing of company funds. The *Incident Commander* will execute the majority of the command activities.

Safety Officer

The Safety Officer's primary function is to assess hazardous and unsafe situations and develop measures for assuring personnel safety and correct unsafe acts or conditions. The Safety Officer will ensure the preparation and implementation of the Site Safety Plan and approve the Medical Plan. The Safety Officer has the authority to stop or prevent unsafe acts or conditions when immediate action is required.

Public Information Officer

This position will be responsible for coordination of all media releases. In his absence, or until he arrives, the Incident Commander will designate someone to organize all media personnel in one location and ensure that no one enters the facility and that no statement is given to the media without prior approval from the Incident Commander.

Liaison Officer

This position will be the point of contact for representatives from Federal, State and local regulatory agencies. They will be responsible for appropriate notification to such agencies as required.

The *Section Chiefs* (Planning, Operations, Logistics and Finance) report to the Incident Commander and are not part of the Command Staff.

Planning Section Chief

The Planning Chief oversees all incident-related data gathering and analysis. Additionally, the Planning Chief will manage the development of spill trajectories, wildlife impact assessments and weather information (atmospheric, tidal and current). The Planning Section Chief will also oversee the determination of environmentally sensitive areas and special considerations for those areas. The Planning Chief will be positioned at the Incident Command Post during the emergency.

Spill Tracking and Trajectory contractors are listed in **Appendix B**.

Operations Section Chief

The Operations Chief will be responsible for the implementation of the Incident Action Plan (IAP) and Site Safety Plan, as well as developing the Operations portion of the IAP and briefing and designating personnel. This position will report directly to the Incident Commander, but can also be the Incident Commander in smaller situations or until assistance arrives.

Logistics Section Chief

The Logistics Chief will be responsible for the orders and delivery coordination of response equipment, materials and supplies to all response locations. The Logistics Chief will ensure that applicable resources are fueled and maintained, as well as oversee the establishment and maintenance of communications

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systems, the coordination of meals and bathing, and all onsite security initiatives. The Logistics Chief will coordinate all related transportation services.

Finance Section Chief

The Finance Section Chief will be responsible for the management of all contracts needed to support the response operations. This responsibility includes the comprehensive tracking and documentation of response costs, as well as receiving and processing claims related to the incident.

4.3.2 Incident Command Post

The designated Incident Command Post is located at the O'Brien's corporate office, 2000 Old Spanish Trail, Suite 210, Slidell, LA 70458. Additionally, the Nautilus office has been designated as the command post for company personnel. The Houma office has been designated as an alternate command post.

4.3.3 Information

Internal Communication

Information flow is vital to response operations. The Communications Unit Leader will establish a communications plan and call out additional communications equipment, as needed. Cellular phones and/or VHF/UHF handheld radio communication systems will be utilized in addition to land line systems. Networks will be developed as necessary (command, tactical, support, ground-to-air, air-to-air, etc). The facility will exchange radios with the OSRO and/or SMT during the incident. This will enable the SMT to communicate with spill response team members by radios tuned to designated frequencies.

Community Notification

In the event that community notification of a spill is required, the police or sheriff's department will be notified for assistance by calling 911. In the event that public notification of a spill is required, as deemed necessary by the FOSC, note the following guidelines:

- The nature and extent of the economic losses that have occurred or are likely to occur
- The persons who are likely to incur economic losses
- The geographical area that is affected or is likely to be affected
- The most effective method of reasonably notifying potential claimants of the designated source
- Any relevant information or recommendations submitted by the owner, operator, or guarantor of the designated source

Media Notification

Accurate reporting of activities to the news media and to the general public is necessary during an oil spill. The primary objective is to ensure that all reports are timely, factual and represent the company's position fairly and accurately.

For larger spills with more media interest, it may be necessary to seek assistance from the FOSC. Under Unified Command, a Joint Information Center (JIC) may be established. The Public Information Officer will make every reasonable effort to cooperate with the media and provide necessary facilities to accommodate their needs.

It may become necessary to make scheduled press releases during highly publicized, sensitive, or incidents of great public concern. The press should be consulted to establish a schedule. It may be beneficial to arrange for a single contact point with the press which can then provide information to all other press organizations.

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Public statements will contain the following type of information as appropriate:

- Nature, time, and location of the incident and other facts that are not in dispute
- Time, place, and number of people injured or killed
- Current status of the incident
- Name of contact for more information
- Steps the company has taken or has firm plans to take to contain, control, or handle the spill (if facts are not in contention)
- Whether or not danger is present
- Whether or not there have been any evacuations or power disruptions
- State that it is the company's policy to prevent pollution of the sea, coastline or inland waters (whichever is appropriate) and to minimize danger to the environment
- Containment and cleanup experts on the scene or on the way
- Type of oil spilled
- Volume, if known (or estimates as provided to regulatory agencies)
- Movement of wind, current, and weather which may affect movement of the spill
- Equipment and manpower directed to efforts
- Special efforts to protect property or wildlife
- Concurrence that appropriate agencies have been (are being) fully notified and/or informed

Statements regarding the following should be avoided:

- Liability for a spill
- Speculation regarding the cause and size of spill
- Dollar amounts of damage and/or containment and cleanup
- Estimates of time required to complete cleanup
- Promises that property, environment, etc. will be restored to normal
- Statements regarding appropriateness of response by other companies or governmental agencies
- Names of injured or dead until next of kin have been notified
- Discussion of previous incidents

Providing information directly to members of the impacted community, free of the filtering and potentially distorting effect of the media is critical to public understanding of the incident response. Community relations may include scheduling of public meetings, preparing speeches, and coordinating public activities with public officials and protocol personnel. An Initial Media Release form is located in **FORMS Appendix**.

Plans for Families of Employees

In the event of a large incident, with numerous responders, the Incident Commander will add a Human Resources Officer to his or her Command Staff. This person will be the point of contact for families of employees. Personnel will be tracked through logs. There will be official check in logs at the incident which will support personnel accountability. Supervisors must maintain a Unit Log indicating names of personnel assigned in their unit. If necessary, Human Resources will contact the appropriate supervisor to relay a message to the employee.

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4.3.4 Safety

Spill response activities pose varying degrees of danger to responders. The primary objective of any response activity is the protection of the safety and health of responders and the general public. Realizing this objective requires the chemical and physical hazards associated with each response activity be assessed and appropriate methods implemented to prevent or minimize potential harm. For example, the identification (or detection) of a particular chemical constituent of the spill material may necessitate changes in the safety protocols employed in the response. Additionally, potential impacts to the health and safety of the public must be identified and controlled (or minimized) through the utilization of early countermeasures. In order to satisfy the requirements of this plan, each response organization must have an effective health and safety program, including medical surveillance and health monitoring, appropriate safety equipment, standardized safety procedures, and an active training program. The Safety Officer is responsible for monitoring and assessing hazardous or unsafe situations and instituting (or formulating) measures that ensure personnel safety.

The Safety Officer will:

- Monitor activities and developing situations
- Utilize the established (or customary) chain of command to prevent or correct unsafe activities or conditions
- Ensure the preparation and implementation of the Site Safety Plan
- Identify hazardous or unsafe situations associated with the incident by ensuring the performance of a preliminary and continuous site characterization and analysis, which shall include the identification of all actual and potential physical, biological, and chemical hazards known or suspected to be present on the site
- Participate in the planning meetings to identify any health or safety concerns inherent in the operations daily work plan
- Review Incident Action Plan for safety implications and integrate safety measures in each Incident Action Plan
- Exercise emergency authority to stop or prevent unsafe acts
- Investigate accidents that occur within incident areas
- Ensure the preparation and implementation of the site specific Health and Safety Plan (HASP) in accordance with the ACP and State and Federal OSHA regulations. The HASP shall at a minimum address, include, or contain the following elements:
 - Health and safety hazard analysis for each site task or operation
 - Comprehensive operations work plan
 - Personnel training requirements
 - PPE selection criteria
 - Site specific occupational medical monitoring requirements
 - Air monitoring plan for area personnel
 - Site control measures
 - Confined space entry procedures (only if needed)
 - Pre-entry briefings (tailgate meetings), initial and as needed
 - Pre-operations health and safety conference for all incident participants
 - Quality assurance of HASP effectiveness
 - Assign assistants and manage the incident safety organization
 - Review and approve the medical plan
 - Maintain unit/activity log

A Site Safety Assessment form is located in the **FORMS Appendix**.

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4.3.5 Wildlife Rehabilitation Procedures

Only trained personnel from the U.S. Fish and Wildlife Service or the State Parks and Wildlife Departments, or rehabilitators permitted by these agencies are allowed to capture and rehabilitate oiled wildlife.

If a spill results in damage to wildlife, Wildlife Rehab & Education (WR&E), Inc. and or Wildlife Response Services LLC will be utilized.

Wildlife Rehab & Education, Inc. (WR&E)	Wildlife Response Services LLC
Sharon Schmalz Wildlife Center 7007 Katy Road Houston, TX, 77024 (b) (6) -cell (713) 861-WILD (9453) (b) (6) -home (713) 279-1417-pager	Rhonda Murgatroyd P.O. Box 842 Seabrook, Texas 77586 (713) 705-5897 (281) 266-0054-pager
South Texas Coastal Response	
Tony Amos UT Marine Science Institute & Animal Rehab Keep (ARK) (361) 749-6720	

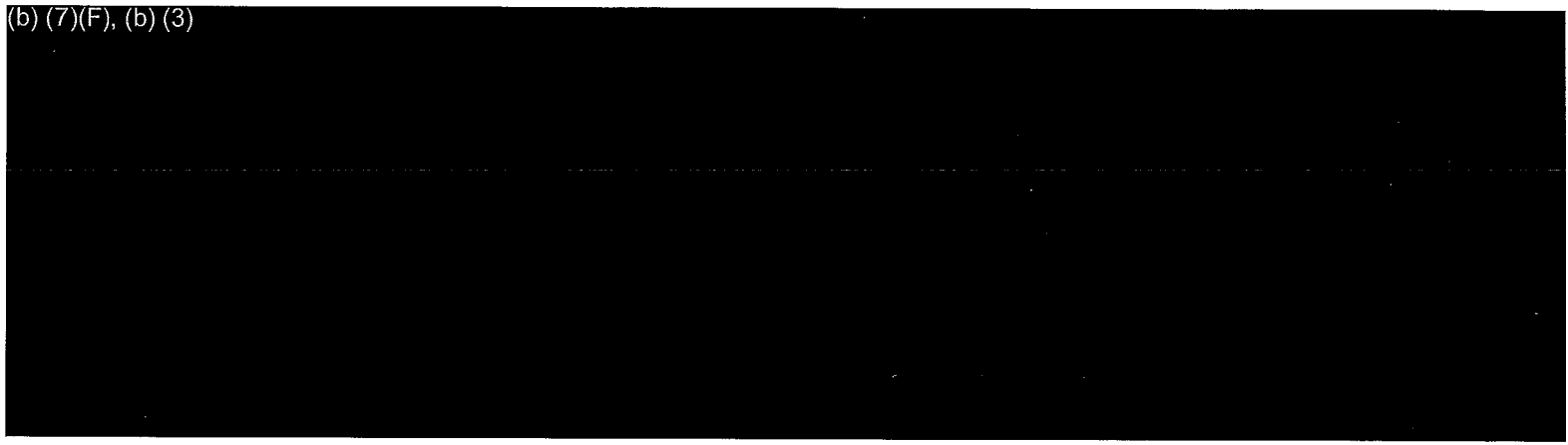
- When it is first determined that bird rescue and rehabilitation operations may be needed, Wildlife Rehab & Education (WR&E) or Wildlife Response Service LLC will be notified as soon as possible.
- The WR&E Oiled Wildlife Response Team or the Wildlife Response Service LLC Response Team will advise state and federal agencies and Nautilus Pipeline Company, L.L.C. if a rehabilitation facility needs to be set up or if the Clean Gulf Associates or Texas General Land Office Oiled Wildlife Response Trailers need to be utilized.
- The WR&E Response Team or Wildlife Response Service LLC Response Team will supervise the medical care, cleaning, aftercare and release of the oiled wildlife and act as liaison with state and federal agencies and Nautilus Pipeline Company, L.L.C. regarding the oiled wildlife response.

4.3.6 Incident Security

(b) (7)(F), (b) (3)

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(b) (7)(F), (b) (3)



4.4 Operations

4.4.1 Operational Response Objectives

- Continuously assess personnel safety
- Secure or isolate the source
- Contain the product
- Protect sensitive areas
- Recover product
- Rehabilitate wildlife and resources
- Clean impacted areas
- Coordinate response actions
- Document response
- Customize response organization
- Think ahead and anticipate needs

4.4.2 Assessment/Monitoring

- Conduct overflights (photos, videos, air eye)
- Classify the type and size of spill
- Acquire samples
- Determine chemical and physical properties of spilled material
- Obtain on-scene weather forecast (12, 24, 48, and 72-hour)
- Track oil movement or projected movement
- Continuously assess human health and environmental concerns
- Determine extent of contamination

4.4.3 Planning Considerations/Protection Priorities

Resource constraints, time constraints, and various response constraints limit the amount of areas that can be protected during a major oil or HAZMAT spill. The following list provides a prioritization of types of areas that must be protected during an incident (this list was adopted from the USCG's One Gulf Plan).

- 1) Public Health
 - Storm drain inlets

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- Public drinking water intakes
- Public utility water intakes
- 2) Threatened and Endangered Species
- 3) Habitat and Species Concentrations
 - Designated wildlife refuges and game management areas
 - Wildlife concentrations (which may vary seasonally)
 - Vegetated wetlands and shoreline
 - Public oyster seed grounds
 - Commercial and recreational fisheries management areas
 - Coastal restoration projects
- 4) Other Public Lands
- 5) Cultural and Historical Sites
- 6) Exposed Tidal Flats
 - Shell beaches and rip rap
 - All other beaches
- 7) Sheltered Rocky Shores and Sea Walls
- 8) Private Recreational Areas and Facilities
- 9) Marinas
- 10) Private and Industrial Raw Water Supplies

4.4.4 Procedures for Implementation of Tactical Plan

- Maximize protection of response personnel
- Deploy boom immediately to prevent the spread of pollution and to protect the environment
- Boom off sensitive areas
- Deploy boom to corral a drifting slick and divert it to a suitable collection point
- Maximize on-water containment and recovery operations
- Handle wastes to minimize secondary environmental impacts

4.4.5 Procedures for Mobilization of Resources

A major consideration during a spill is the coordination of the transportation and delivery of manpower, equipment, and materials used in response operations. The ground support unit (Logistics) will work with local authorities (state police) to establish land routes which will expedite the movement of personnel, equipment, materials and supplies to the Staging Area and waste products from the Staging Area. The facility will utilize status boards to coordinate all equipment, personnel and materials mobilized to the spill site. Equipment will first be mobilized from the OSRO warehouse to the Staging Area. The Staging Area Manager will direct which equipment will be delivered to which Division/Task Force. Mobilization of Resources can be completed within Tier I, II, and III time requirements.

4.4.6 Sustained Actions

Response operations will need to be managed 24-hours a day, seven days a week until the operation is complete. Once the initial emergency stage of the spill situation has transformed to the sustained action stage, the response management structure will develop more prolonged mitigation and recovery action strategies.

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4.5 Alternative Response Strategies

Alternative Response Strategies are a general category of response countermeasures other than mechanical recovery, such as the use of in-situ burning, chemical dispersants, or other biological or chemical agents, utilized to clean up a spill. The response strategies pursued will depend on the nature of the spill, changing conditions, available resources, and time.

Subpart J of the National Contingency Plan (NCP) regulates the use of dispersants, other chemical agents, and bioremediation agents; it also establishes the NCP Product Schedule, which is a listing of dispersants and other chemical or biological products that may be authorized by EPA for use on oil spills. Inclusion of a product on the NCP product schedule indicates only that the technical product data requirements have been satisfied: listing does not mean that the product is recommended or certified for use on an oil spill.

The Federal On-Scene Coordinator (FOSC) may authorize the use of any of these response options with the concurrence of the Regional Response Team (RRT). The FOSC must first obtain concurrence of the incident-specific EPA representative to the RRT and, as appropriate, the RRT representatives from the state(s) with jurisdiction over the area threatened by the release or discharge, and, as practicable, in consultation with the DOC and DOI natural resource trustees.

Currently, there are no pre-approved response options for inland spills within the United States.

4.5.1 Dispersants

Detergents or other surfactants are prohibited from being used on an oil spill in the water, and that dispersants may only be used with the approval of the Regional Response Team. Due to the location of the *Nautilus Pipeline*, there are no situations where the use of dispersants would be appropriate.

4.5.2 In-Situ Burning

As is the case when any non-traditional cleanup method is considered, extensive evaluation and planning is required before any implementing action takes place. This determination can be made by:

- Analyzing the spill situation in question and comparing it to the parameters that will support product combustion (determine if the product will respond to in-situ burning)
- Assessing threats to human health/welfare, and natural resources
- Assessing availability of resources that will be required for in-situ burning operations, and estimating long term costs (determine if in-situ burning is feasible)
- Reviewing general guidelines for in-situ burning to gain additional information and possible factors to be considered
- Weighing the advantages and disadvantages of in-situ burning against the advantages and disadvantages of other remediation/response methods

Use of in-situ burning requires Regional Response Team (RRT) approval. An In-Situ Burning Authorization Form (refer to **FORMS Appendix**) should be completed, submitted to, and approved by the Regional Response Team before any controlled burning can take place.

4.5.3 Other Chemical/Biological Agents

There are a wide variety of biological and chemical treating agents that are available for use during a spill. These products include bioremediation-enhancing nutrients, elasticity modifiers, emulsion treating agents, firefighting foam, shoreline pre-treatment agents, solidifiers, surface collecting agents, and surface washing agents. Approval for the use of any of these products must be obtained by the FOSC from the Regional Response Team. They must only be utilized if safe to do so. A Request Format for Use of Alternative Response Technology should be utilized to facilitate the approval process (refer to **FORMS Appendix**).

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4.6 Termination and Follow-up Actions

Cleanup will be conducted as thoroughly as possible, but will be terminated when, in the opinion of the Incident Commander and FOSC:

- There is no detectable oil in the water
- Further removal actions would cause more environmental harm than remaining oil
- Cleanup measures would be excessive in view of their insignificant contribution to minimizing a threat to the public health, welfare, or the environment
- Actions required to repair unavoidable damage resulting from removal activities have been completed

The Planning Section Chief will develop a plan of demobilization and assist Operations units to ensure that an orderly, safe, and cost-effective demobilization of personnel and equipment is accomplished.

General demobilization considerations for all personnel are:

- Complete all work assignments
- Brief subordinates regarding demobilization
- Complete and file required forms and reports
- Follow check out procedures provided by the IC
- Evaluate performance of subordinates prior to release
- Return communications equipment or other non-expendable supplies
- Report to assigned departure points on time or slightly ahead of schedule

The IC will convene a meeting to summarize the incident, and a complete report will be developed within 90 days. This report will record the incident as it developed and will identify, in detail, the actions taken, resources committed, and any problems encountered. The IC will include a recommendation outlining any suggested changes of policies or procedures. The format of this report will be as follows:

- Summary of Events-a chronological narrative of all events, including:
 - The location of the oil discharge
 - The cause of the discharge or the release
 - The initial situation
 - The organization of the response, including State participation
 - The resources committed
- Content and time of notice to natural resource trustees relating to injury or possible injury to natural resources
- Comments on Federal or State damage assessment activities and efforts to replace or restore damaged natural resources
- Treatment/disposal/alternative technology approaches pursued and followed
- Public information/community relations activities
- Effectiveness of Removal Actions-a thorough analysis of removal actions taken by:
 - The company
 - State and local agencies
 - Federal agencies and special teams
 - Contractors, private groups, and volunteers (if applicable)
- Difficulties Encountered-a list of problems affecting response, including problems of governmental coordination.

Recommendations-IC recommendations, including at a minimum:

- Means to prevent a reoccurrence of the discharge or release

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- Improvement of response actions
- Any recommended changes in the plan

Enclosures to the report:

- Maps, charts, photographs, or diagrams of the areas affected by the spill
- Radio, telephone, and other applicable logs
- Photographic documentation of the response, arranged chronologically
- Any other documentation necessary to supplement the information in the IC report

4.6.1 Medical Needs of Public and Responders

If a non-responding employee or member of the general public is in need of medical attention due to an suspected exposure to the spill, the following steps will be taken:

- A person witnessing a medical emergency will respond by calling 911
- Assess the situation
- Determine condition of injured person
- Render first aid if possible
- If the injured person is able, have him or her prepare an appropriate incident report. If the injured person is unable, the Safety Officer or his or her designee will fill out the report.
- Contact the Command Post to arrange for transportation to medical facility, if needed
- Interview all witnesses
- Transport injured person
- Send incident report with the injured person and forward copy to the Safety Officer
- Document the facts of the incident investigation with photos, written information, etc.

Phone numbers for hospitals, medical centers, other medical assistance, and transportation are listed in **Appendix B**.

4.6.2 Salvage Plan

The first priority in a vessel casualty is the safety of the crew and any other personnel in the area. Secondary concerns are for environmental protection and vessel salvage. Responders aboard the vessel will need to collect as much scene information as possible, as this information will become essential to the early efforts of salvage.

Salvage is a term used to describe all services rendered to save property from marine peril. This broad definition encompasses not only actions undertaken to save a vessel or cargo, but also includes wreck removal, harbor clearance, and deepwater search and recovery. Salvage includes:

- Providing firefighting assistance (if safe to do so)
- Refloating a vessel
- Offloading cargo or water to prevent foundering, or removing sound cargo from impending peril
- Shoring, patching, and making temporary repairs to correct structural, stability, or mechanical problems
- Rescue towing of an incapacitated vessel to a safe haven
- Preventing pollution

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Salvage Tug

A salvage tug is a tugboat equipped to attend to vessels in distress in coastal or ocean conditions and to render assistance either by towing, or provision of equipment, pumping, or similar aid. Such tugs historically have been large, powerful, and stationed at high risk locations for ship traffic.

Rescue Tug

A rescue tug is generally a "tugboat of opportunity," having adequate horsepower or bollard pull strength to assist in controlling a distressed vessel until salvage resources arrive. A rescue tug would generally be capable of providing emergency towing and, quite possibly, render a degree of firefighting assistance (if safe to do so), since many of the newer tugs are equipped with firefighting water monitors. Rescue towing involves taking an incapacitated vessel under tow at sea and towing it out of harm's way, generally to a safe haven or port, but sometimes for beaching.

Salvage Masters

The person in charge of a salvage operation is known as the Salvage Master. A Salvage Master will have direct experience in ship salvage, demonstrating experience in the use of salvage ships and craft, ground tackle, heavy lift craft cranes and booms, oil pollution containment equipment, and all ancillary types of salvage equipment; for example, pumps, compressors, and/or welding equipment. The Salvage Master acts under the direction of the unified command. He/she generally assumes complete control of salvage, harbor clearance, and related engineering operations.

Federal Salvage Resources

In the event that the facility does not respond to the casualty, the federal government may respond to the salvage requirement, utilizing the services of the Navy Supervisor of Salvage (SUPSALV). However, financial responsibility remains with the facility. SUPSALV can provide the services of naval architects, (may provide the services of naval salvage vessels), and has access to contracts that will provide the services of commercial salvors and equipment. SUPSALV has developed and available software for rapid analysis of longitudinal strength and intact/damaged stability.

Technical support is also available from the Marine Safety Center (MSC). This group can evaluate vessel stability, hull strength and salvage plans, and may be available for on-scene assistance. The MSC may be able to provide vessel plans if the ship is U.S. flag.

The USCG Gulf Strike Team can be on the scene quickly to provide initial response assistance with pumps, personnel, pollution control equipment, and miscellaneous salvage hardware.

Salvage Response Considerations

When salvage operations are required, the unified command will activate the salvage experts and have them report to the command post or communicate by telephone. The primary written guide on salvage operations is the U.S. Navy Salvage Manual. All parties involved in a salvage response will refer to the manual for specific information relating to salvage techniques.

Salvage efforts may be divided into three phases; stabilization, refloating and post-floating. During the stabilization phase, salvors take steps to limit further damage to the vessel and to keep the ship from being driven harder aground or broaching. Response leaders gather information and formulate a salvage plan. The plan specifies actions to be taken during the refloating and post-refloating phases of the salvage. The refloating phase commences when the salvage plan is executed and ends when the ship begins to move from her strand. During post-refloating, the vessel is secured and delivered to the designated port facility.

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4.6.3 Oil Characteristics

The oil type handled by the facility is described as follows:

Group 1—Very light refined products

(For example, gasoline, naphtha, solvents, Avgas 80/100)

- Very volatile and highly flammable (flash point near 0°–73°F/22.8°C)
- High evaporation rates (complete removal by evaporation is likely)
- Low viscosity (spread rapidly to a thin sheen)
- Specific gravity less than 0.80 (floats on water)
- High acute toxicity to biota (can cause localized, severe impacts to water-column and intertidal resources)
- Will penetrate substrate, causing subsurface contamination
- Recovery usually not attempted because of fire hazards
- Exclusion booming of sensitive areas must be completed rapidly

4.6.4 Oil/Debris Containment and Removal Procedures

Shallow Water/Shoreline Protection

Every effort must be made to protect environmentally and economically sensitive areas. The following methods will be employed for protection of these areas:

- Open water boom—In areas of shallow water, it may be possible to collect or corral the oil with open water boom and take it to deeper water or low-current areas that have better skimmer access and higher recovery rates.
- Bottom-seal boom—This boom is designed for deployment on a sandy beach. This boom's special features allow it to conform to the substrate, so that it can continue to act as a barrier to oil during changing tides or lower water levels. Shallow water boom is effective in higher-current areas because the shallow skirt minimizes the drag in the current.
- Sorbent Boom—Sorbent boom is designed primarily to absorb oil although it can act as a protective measure against thin oil sheens under very quiet water conditions. Snare boom (pom-poms tied onto a line) is effective as a sorbent of more viscous oils under higher wave and current conditions. In any current, sorbent boom can contain only the thinnest sheens. When used with conventional booms, sorbents can be placed outside of the boom to pick up small amounts of escaping oil, or inside the boom to absorb small amounts of contained oil.
- Inland Boom—Inland boom is the smallest conventional boom and is designed for deployment in very shallow water; as the draft is only 6-12 inches. It is normally deployed in more protected waters where there is little or no wave action.

Spills in Natural Environments

The response techniques, or combination of techniques, employed in a spill are dependent upon the product spilled, quantity, location, response time, weather conditions, responder capability, and availability of response equipment. Response strategies have been described in terms of environmental sensitivity for a range of shallow water and inland habitat types.

Sound cleanup decisions depend on accurate information about the types of habitats that the oil affects, the degree of oiling, and the location of oiling. *Characteristic Coastal Habitats*, *Choosing Spill Response Alternatives*, and *Options for Minimizing Environmental Impacts of Freshwater Spill Response*, illustrate typical physical and biological attributes of North American coastal habitats (or aquatic habitats) at risk from oil spills. The text describes each habitat and discusses both how oil is likely to behave there and

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considerations for treating oil. Digital versions (.pdf) of these documents are available at the following Web site:

http://response.restoration.noaa.gov/book_shelf/911_coastal.pdf

Portions of these document(s) covering oil spill removal techniques have been included in **Appendix F**.

The Characteristic Coastal Habitats collection is a useful aid for training people who will be participating in cleanup assessment as part of an environmental unit within the Incident Command System. It also complements NOAA's *Shoreline Assessment Manual and Shoreline Assessment Job Aid*.

4.7 Waste Management

Oil spill cleanup by mechanical recovery will involve the further handling of recovered oil and oiled materials. These will be directed to the appropriate reclamation/disposal site. Normally, the waste generated from a mechanical recovery operation will be classified as Exploration and Production Waste (E&P). In rare instances where it is suspected that extraneous substances have been introduced into a spill, it is appropriate to test the recovered oil for hazardous waste characteristics (ignitability, reactivity, corrosivity, and toxicity). Oil/debris disposal procedures can meet Tier I, II, and III time requirements utilizing equipment and manpower from the OSROs listed in this plan.

4.7.1 Oil/Water/Debris Separation

The different types of waste generated during response operations require different disposal methods. Waste will be separated by material type for temporary storage prior to transport. **Table 4** lists some of the options available for separating oily wastes into liquid and solid components. The table also depicts methods that may be employed to separate free and/or emulsified water from the oily liquid waste.

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Table 4: Separation Methods for Different Types of Recovered Wastes

Waste Type	Separation Methods
<i>Liquids</i>	
Non-emulsified oils	Gravity separation of free water
Emulsified oils	• Emulsion broken to release water by: ○ Heat treatment ○ Emulsion breaking chemicals ○ Centrifuge ○ Filter/belt press
<i>Solids</i>	
Oil mixed with sand	• Collection of liquid oil leaching from sand during temporary storage • Extraction of oil from sand by washing with water or solvent • Mechanical sand cleaner • Removal of solid oils by sieving
Oil mixed with cobbles, pebbles or gravel	• Screening • Collection of liquid oil leaching from shoreline material during temporary storage • Mechanical sand/gravel cleaner • Extraction of oil from shoreline material by washing with water or solvent
Tar balls	Separation from sand by sieving

4.7.2 Temporary Storage of Recovered Oil

- Oil recovered by skimmer(s) is transferred to portable tanks. It is important to ensure temporary storage devices are of sufficient size to allow continued operations. If storage capacities are not sufficient, additional equipment could be utilized including rubber bladders, roll off boxes, and mud tanks.
- Skimmer tanks allow for gravity separation of the oil from the water. The separated water is transferred through a hose and discharged forward of the recovery pump. This method is called "decanting". This process is vital to the efficient mechanical recovery of spilled oil because it allows maximum use of limited storage capacity, thereby increasing recovery operations. Approval must be obtained from federal and state agencies prior to decanting.
- Oiled debris collected requires specific handling. Contaminated materials will be placed in leak proof, sealable containers on the recovery vessels and transported to appropriate facilities for processing, recycling, or disposal.
- Recovered oil will typically contain substantial quantities of water and debris. Excess water, sand, and other materials greatly increase the quantity of waste and its associated cost for transportation, processing, and disposal. To remedy this, different methods can be employed at the cleanup site to separate oiled debris from excess materials. Using screens, filters, conveyor systems, and settling tanks, oil/water mixtures can be drained from debris and collected in temporary containers for further treatment.

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- Clean sand and shoreline materials can be separated from oiled materials and returned to the shoreline. Not only is this cost effective from an operations perspective, it also provides an efficient means of returning clean, excavated material back to the shoreline as a restorative measure.
- Oil spills often occur in remote sites that are some distance from transportation routes and storage facilities. In these situations, temporary on-scene storage arrangements may be required. Oil may be stored in Baker tanks, tank trucks, 55-gallon drums, bladders, or empty fuel storage tanks. Such tanks permit decanting of water from the oil. If suitable containers are not available, oily waste may be temporarily stored in pits dug in the soil (FOSC and SOSC will need to be contacted prior to doing this). These pits will need to be lined with plastic sheeting to prevent oil leakage and soil penetration. To minimize contamination of surrounding areas from leaching oil, storage sites should not be located on or adjacent to ravines, gullies, streams, or the sides of the hills, but rather in areas with minimal of slope.
- Temporary storage methods discussed in this section can be conducted within appropriate Tier I, II, and III time requirements utilizing equipment from USCG-certified OSROs.

4.7.3 Recycling

Whenever possible, recovered oil should be returned to the production system for recycling. A secondary means of handling recovered oil may be through a commercial oil reclaimer. When utilizing this secondary option the oil will be classified as nonhazardous and must be shipped to an approved reclaimer.

4.7.4 Disposal Regulations

- Oiled Materials-If these materials have not contacted extraneous substances, they will be classified as nonhazardous and will only be disposed of at the owner/operator's approved nonhazardous waste disposal site. In some cases it will be appropriate to seek permission from the appropriate state agency to burn the oiled material.
- Oil and oily wastes that are contaminated or excessively weathered will require transport to an approved disposal site. Any transport or disposal of material that is considered hazardous waste must follow the requirements of the Resource Conservation and Recovery Act (RCRA).
- Regulatory Guidelines:
 - Only state licensed hazardous material haulers are used to transport recovered oil. These licensed waste haulers must have a US EPA ID number and a state transporter ID number.
 - The Uniform Hazardous Waste Manifest must be filled out by the waste generator for each truckload of oily wastes hauled away for disposal.
 - When completing the manifest, the owner/operator is listed in the manifest as the generator. The manifest will need to be signed by the designated representative, and marked with the statement: "This material is being disposed of by the owner/operator as part of a response action in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300)."
 - Recovered waste oil must be properly packaged and labeled prior to transport in accordance with 40 CFR 262.30.
 - All wastes shipped off-site for disposal must be transported in compliance with applicable regulations. These include the RCRA regulations in 40 CFR 262-263, the DOT Hazardous Materials Regulations in 49 CFR 171-178, and any applicable state regulations. Ensure shipments of waste collected during spill cleanup activities are transported in suitable containers to eliminate secondary releases during transport. If the nature of the waste precludes packaging in the required container, the Incident Commander will request emergency exemptions from the regulations following procedures outlined in 49 CFR 107.
 - Only state-certified disposal sites will be used by waste haulers, unless recovered oil can be sent for recycling

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- Unit personnel must track the Uniform Hazardous Waste Manifest and retain appropriate records per 40 CFR 262.40. Unit personnel will receive a signed copy of the manifest from a designated disposal facility within the specified time limits. The owner/operator must retain copies of Hazardous Waste Manifests in unit files for at least three years.
- A Waste Management Form (refer to **FORMS Appendix**) will be completed during the time of the spill.

4.7.5 Disposal Transportation and Designated Sites

Transportation of oil and oily waste may be accomplished by a tank, vacuum truck, or barge. Only trucks or barges which have been *certified for waste oil transport* will be utilized. Oil or oily debris recovered from a spill site may only be disposed of at authorized sites.

4.8 Incident Documentation

The Incident Commander (IC) will coordinate the post-accident review in conjunction with federal, state, and local officials. This investigation will begin after the source of the incident has been corrected, eliminated or repaired, and the facility has been declared safe by the IC. The IC will take the following steps during a post-accident investigation:

- Obtain all data, information, and reports pertaining to the accident, leak, or incident
- Interview in person or by telephone each person with direct knowledge of the accident
- Analyze the response of the emergency shutdown system, relief valve, or any other safety device to determine if the facility controls reacted as per design. Determine if design changes to the existing safety systems or additions are necessary.
- Review the response of operations personnel to determine if procedures and training were followed and are appropriate
- Evaluate other potentially dangerous situations which could have occurred and if the response of personnel and safety systems would have accommodated those situations had they occurred.
- Prepare recommendations as appropriate for changes to:
 - Design of facility
 - Operating procedures
 - Training
 - Communications
 - Emergency response plans and procedures

The IC will prepare and issue a written report to all facility/pipeline procedure holders with any changes deemed appropriate.

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5.0 Other Incidents

5.1 Fire

5.1.1 Response

For all fires, if safe to do so, personnel will:

- 1) Determine where the fire/explosion has taken place
- 2) Notify everyone of the location
- 3) Account for all personnel in the area of the fire
- 4) Dial "911" and request assistance from the local fire department
- 5) Rescue stranded/injured personnel (if safe to do so)
- 6) Assess fire and determine:
 - o Class of fire
 - o Appropriate extinguishing agent (Product MSDS are maintained at the operations office)
 - o Methods to prevent the spread of the fire
 - o Necessary personnel and firefighting methods
- 7) Prevent environmental pollution
- 8) Limit damage to the facility
- 9) Establish communications

Facility employees are provided training to respond only to incipient fires. If an employee encounters a fire at a stage that can be controlled by means of a readily accessible fire extinguisher (e.g. small 30 pound dry chemical), if safe to do so, the employee may elect to attempt to extinguish.

If you are called on to use a fire extinguisher, remember the word PASS. To operate a fire extinguisher:

- 1) **P**ull the pin at the top of the extinguisher (after removing the fire extinguisher from holding rack)
- 2) **A**im the hose or nozzle at the base of the fire
- 3) **S**queeze the lever slowly.
- 4) **S**weep from side to side.

Approach the fire from upwind, if possible.

Remember: Aim at the base of the fire not at the flames, and the extinguisher will only operate as long as the lever is depressed.

If an attempt to extinguish the fire is unsuccessful, then the "911" call is initiated.

5.1.2 Prevention

The purpose of the Fire Prevention Plan is to inform personnel of the physical hazards of chemicals handled on-site, how physical and health hazards are communicated at the facility, and the importance of following proper work procedures and company policies to prevent the occurrence of fires.

Flammable materials handled include diesel fuel, crude oil, natural gas, natural gas condensate and produced water (oil sheen only). It is important to control potential ignition sources when handling flammable materials. These potential ignition sources include, but are not limited to, welding and burning operations, open electrical circuits, static electricity, smoking, and accumulation of combustible waste materials. The following policies are established in order to prevent potential ignition hazards:

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- No flammable or combustible liquids will be allowed to escape uncontrolled.
- Buckets will be used to contain residue when breaking or disconnecting flanges or hoses.
- Product residues will be properly contained in marked and labeled drums and properly sealed to prevent evaporation.
- All welding and burning operations, and operation of internal combustion engines or electrical equipment inside firewall areas, docks, or near flammable/combustible materials require the issuance of a hot work permit prior to beginning the tasks.
- The Operator will be responsible for preventive maintenance and repairs to all electrical and emergency equipment, to include: electrical motors, cords, EPC's, etc., and fire equipment.
- All new installations will be reviewed by the Technical Services Representative, the Maintenance Manager, and the Safety Department to ensure compliance with appropriate codes and standards.
- Frequent inspections of the operations will be conducted.
- Flammable and combustible materials will be disposed of in proper receptacles, and not allowed to accumulate and present a hazard to employees or the facility.
- Hoses will be capped to prevent vapor releases or potential spills.
- All grounding leads will be attached prior to transfer operations.
- Leaks from fittings will be reported to the appropriate department so repairs can be made or equipment put out of service.
- Rags and other hazardous debris (pigs, absorbents) will be contained in hazardous waste drums positioned throughout the facility.

5.2 Gas Release

In the event of a gas release, the person making the discovery will take command of the situation until relieved by a more qualified employee. If safe to do so, the situation will be addressed in the following order:

- 1) Determine which gas line is leaking
 - Do not enter a gas cloud; make determination from a safe place
 - Use appropriate PPE or SCBA before proceeding
- 2) Eliminate all ignition sources
 - Do not operate any motor vehicles/engines
 - No smoking
 - Extinguish flame in fired heaters
 - Stop all cutting and/or welding
 - Establish fire watch (up wind)
- 3) Depressure the leaking line at the facility ASAP
- 4) If the leak is close to public housing or facilities, evacuate the public and deny entry to the leak areas
- 5) Call 911 for assistance, if applicable
- 6) Notify appropriate manager
- 7) Notify one of the Qualified Individuals
- 8) Notify appropriate gas transmission company (if applicable)
- 9) Notify the National Response Center
- 10) Once the gas line is bled off to a pressure no longer releasing gas to the atmosphere, terminate the emergency response and go to a cleanup/repair action

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5.3 Personnel Injury

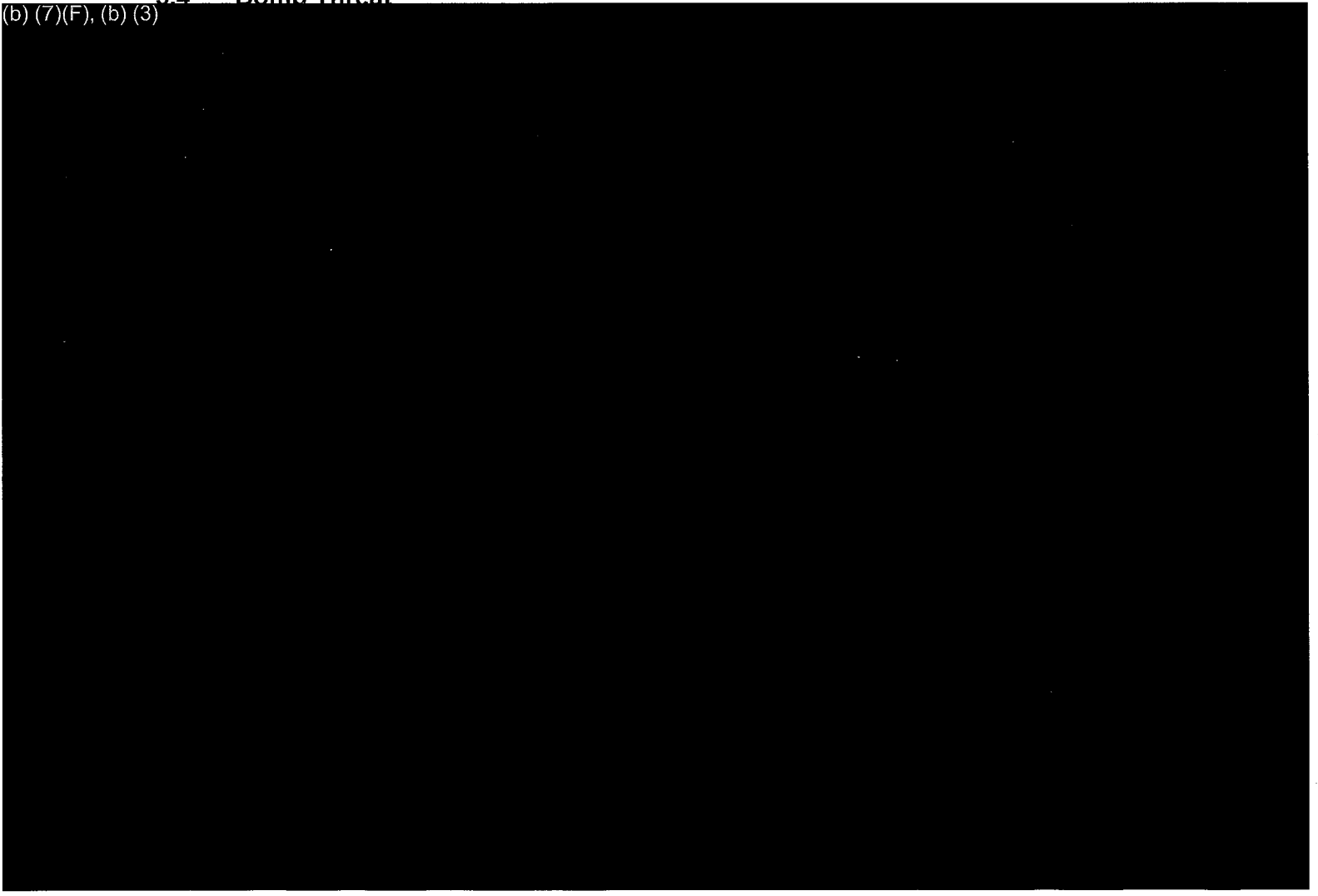
The facility management will most often seek a medical clinic or emergency health care facility in the event of an illness or injury. Contact information for local medical facilities and providers is included in **Appendix B**. Depending on the severity of the injury, management personnel may elect to transport the victim to the medical provider. A person witnessing a medical emergency should respond by dialing "911" with the following information:

- Name of caller
- Type of emergency and condition of employee
- Location
- Call back phone number

The respondent should render first aid (if properly trained), and if necessary, transport the injured person to a safe location. If the injured person is able, have him/her prepare an accident report. If the injured person is unable, the facility manager will fill out this report. Witnesses will be interviewed and facts of the incident will be documented on the report. Post-casualty urinalysis and alcohol breath tests (ABT) will be authorized and administered to injured persons in the case of a pipeline incident. Any injured party choosing not to accept medical treatment or post-casualty drug screens will have "refusal of treatment/drug screen" documented on the report. Personnel injury files are copied and forwarded to the corporate claims office. Medical information and updated, payments to employees and medical providers will also be processed through this office.

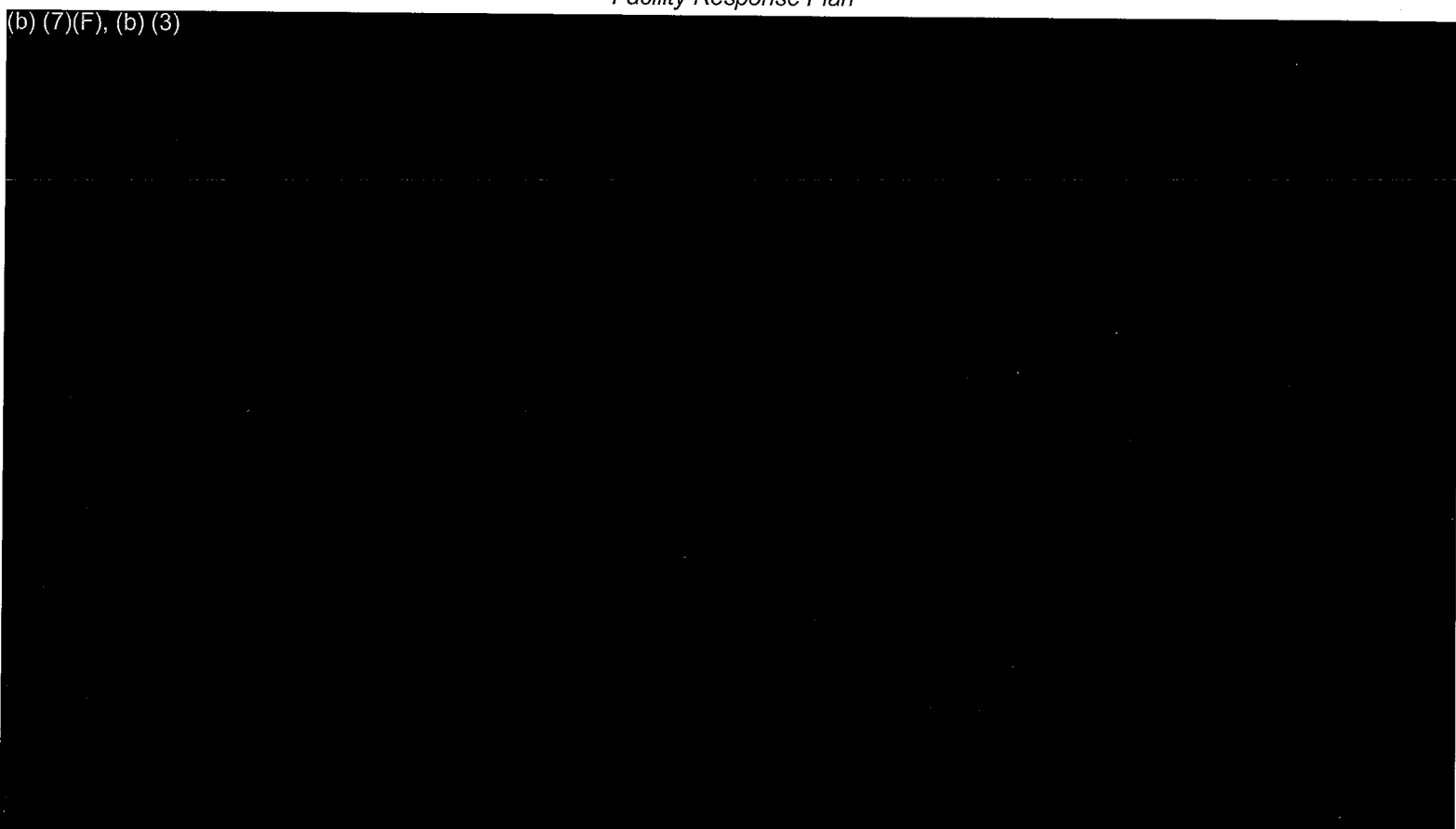
5.4 Bomb Threat

(b) (7)(F), (b) (3)



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(b) (7)(F), (b) (3)



5.5 Natural Disasters

5.5.1 Hurricanes

Hurricanes are tropical cyclones with torrential rains and sustained winds of 74 miles per hour or greater which blow in a counter-clockwise direction around a center "eye". Hurricane winds can exceed 155 miles per hour and severely affect areas hundreds of miles inland. As hurricanes approach the coast, a huge dome of water called a storm surge can impact the coastline, causing major damage to everything in its path. Hurricanes also spawn tornadoes and can cause severe flooding from heavy rains. Hurricanes are classified into five categories based on their wind speeds, central pressure, and damage potential.

Category	Wind Speed (MPH)	Storm Surge
I	74-95	4'-5'
II	96-110	6'-8'
III	111-130	9'-12'
IV	131-155	13'-18'
V	Greater than 155	Greater than 18'

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5.5.2 Non-Hurricane Season–(December 1 to May 31)

Date	Action
	Review local Coast Guard, port authority and county emergency management agency hurricane plans and develop/update operations specific guidance.
	Purchase any missing materials required to cover windows and doors into buildings, and provide tie downs for items stored outside.
	Identify/correct any plan deficiencies.
	Identify hurricane preparation actions and assign personnel to these responsibilities.
	Conduct training/drills ensuring that personnel get to walk through their hurricane preparation duties and handle any materials and tools associated with them.
	Inspect the facility(s) for plan compliance.
	Identify and make arrangements for off-site storage selected equipment that is not needed and would be safer, stored away from the facility, on higher ground if possible. If inside storage is available and chosen, the building must be substantial enough to withstand severe storms. A firm, advance commitment should be obtained for this kind of storage since it is likely to be at a premium when a storm approaches. Outside storage must include secure tiedowns for lightweight materials.

5.5.3 Hurricane Season–(June 1 to November 30)

Date	Action
	Advise employees at beginning of hurricane season. Make hurricane preparedness handouts available, particularly for employees who are new to the region. Local publications provide articles on hurricane preparedness may be reproduced locally.
	Provide guidance to employees and their families on selection of emergency supplies and how to prepare homes for hurricanes. As soon as a hurricane watch or warning is set for an area, supplies will instantly become scarce.
	Survey all inside storage areas and identify locations that can be used to accommodate equipment and drums of oil or other chemicals that are routinely kept outside.
	Refresh stocks of consumable hurricane supplies for use at the facility.
	Review tank fill height table to ensure data is current and minimum fill levels can be reached for all category hurricanes.
	Develop a list of actions that must be taken to prepare the facility(s) for a hurricane and for recovery following storm passage. Assign personnel to the identified tasks and post the list so that employees will know what is expected of them.
	Prepare/update a list of employee home phone numbers and addresses. Supervisors should have this information.

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5.5.4 Hurricane Landfall in 48 Hours

Date	Action
	Regularly monitor weather reports. Be prepared to accelerate the pace of preparedness if it is likely that a hurricane condition is going to be upgraded.
	Contact all customers and ascertain service needs. Pay particular attention to police, hospital, and emergency services. Advise customers that all deliveries will stop at Condition I, when the storm is 12 hours from landfall.
	Remind all employees that in off-duty time they should be safeguarding their homes and purchasing emergency supplies. Request employees to consider where they will ride out the storm and advise you of their intentions and locations.
	Review employee assignments for hurricane preparations and update as situations change.
	Tanks with product—If additional new product is available, fill each tank to the minimum level necessary to prevent buoyancy in the event of flooding. If time and supply permits, fill each tank to capacity. If additional product is not available, transfer appropriate product among tanks to prevent buoyancy. If minimum levels cannot be reached through product transfer, add water bottoms. Skim and pump down any oil/water collection basins.
	Identify hoses and related equipment, which will not be needed for transfers. Drain, blind, and remove hoses and related equipment to inside storage.
	Ensure availability/readiness of materials needed to protect buildings; for example, shutters, plywood, sand bags, etc.
	Lighter equipment should be tied down securely.
	Identify all files, records, computer equipment, etc. that must be protected or removed to safe storage. Assess the exact storm conditions and the resources available to accomplish the process of securing office equipment and files. Begin the process now if conditions warrant but, in any event, don't delay beyond the point where Hurricane Condition II is initially set. Make backup tapes and/or disks of computer files, as necessary.
	Survey the facility(s) and identify all items that will be moved to inside storage. Begin moving items to inside storage as conditions dictate. Ensure availability of tie-downs for materials that will not be placed in inside storage space.
	Establish a 24-hour dedicated phone line for all personnel to call and verify personal safety and return to work assignment.

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5.5.5 Hurricane Landfall in 24 Hours

Date	Action
	Tanks that are empty and clean must have manhole plates removed or openings cut in them to allow rising water to enter, thus preventing tank buoyancy.
	Continue to fill tanks with product.
	Charge all spare radio and cellular phone batteries.
	Begin process of securing/protecting windows and doors with shutters or plywood. Remove awnings, signs, and decorative items likely to become missile hazards.
	Complete securing and/or removal of files, records, equipment etc. to safe storage.
	Complete moving equipment and materials to inside storage. If inside storage is insufficient, change any remaining outdoor stacks of drums to single stacks and lash together as appropriate.
	Survey the grounds to remove debris.
	Fill fuel/cargo tanks of all vehicles not needed for present operations and move to secure area. Leave vehicles locked and in park, or in gear for manual vehicles, with the brake engaged.
	Prepare a list of locations and contact phone numbers where employees intend to be during the hurricane. Provide guidance to employees to contact the dedicated manned phone line as soon as practical after storm passage, by any means. The Operations Manager will reach agreement with subordinates on the best way to contact each other. Provide employees with a list of cellular phone numbers that are or will be issued and the name of the person holding each phone. All supervisors must be made aware of the importance of finding out the status of the facility(s) and plans for returning to work, as soon as possible following storm passage, so that this information can be passed to every person.
	Develop and publish a plan that identifies employees who will be required to complete Condition I tasking before the facility is completely secured.

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5.5.6 Hurricane Landfall in 12 Hours

Date	Action
	If the decision is made by management to shut down the facility, cease all commercial transfer operations and initiate facility shutdown.
	Terminate filling of storage tanks. Close and secure all tank valves.
	If applicable, close all roof hatches and ensure roof drains of floating roof tanks are open.
	Make final survey of all grounds and buildings. Secure items found loose or remove them to protected storage.
	Drain, blind, and remove all remaining hoses and related equipment. Close and secure all valve heads; cover as appropriate.
	Complete securing of windows and doors. Close all mechanical louvers.
	Close and secure all tank valves on any installed lube oil tanks. Ensure all tanks have enough product to prevent buoyancy.
	Fill fuel/cargo tanks of all remaining vehicles and move to secure area.
	Drain, blind, and tie down all load rack loading arms. Close and secure all valves on rack. Cover all valve heads with appropriate bags (canvas or plastic). Remove or cover all computer equipment as appropriate.
	Distribute radios and any available cellular phones to key personnel as a potential, alternate form of communications when phone lines may be disrupted.
	The Operations Manager should take the OPA-90 and SPCC plans with him or her when securing the facility(s) in the event cleanup operations must be initiated.
	Shut down AC systems. Shut off electric power at main boxes, lock buildings, gates, etc. and evacuate.
	Ensure evacuation of the facility(s) in sufficient time for personnel to reach safe refuge. If facility personnel need to keep some personnel at the facility(s) during the hurricane, do so only after discussing the situation with the corporate office and receiving approval.

5.5.7 Post Hurricane Operations

Date	Action
	When conditions permit, re-man the facility(s).
	Conduct a survey of the facility(s). Initiate any urgent corrective actions and report the facility status to the corporate office by any means possible.
	Mark any safety hazards such as downed electrical lines, damaged structures, and spilled chemicals or petroleum products. Do not attempt to work on any damaged systems or spills without properly trained people and protective equipment.
	Attempt to establish communications with each of the employees and get an assessment of the condition of their personal households. Establish work assignments based on the facility's ability to function and the employees ability to respond.
	Respond to oil spills in accordance with OPA 90 plans. It is likely that response equipment will need to be brought in from outside.
	Develop a plan that prioritizes repair efforts and identifies resources necessary to accomplish the tasks. If product handling is possible, reach an agreement with the corporate office as to which customers will be given priority. Be aware that vehicle fuels will be in high demand and government agencies may have special needs that must be taken care of.

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5.5.8 Tornado/Storm Warning

The purpose of this section is to establish procedures to be followed in the event the facility(s) receives a tornado warning for your area. A tornado warning indicates a tornado has been sighted or is indicated by radar.

Severe weather alerts are transmitted through sirens in some areas, and by radio and television forecasts. If a tornado warning is broadcast, everyone must assume that a tornado is headed their way and should seek shelter immediately. Typically, there are only minutes between a tornado warning and a tornado strike. So, there should not be any delays in finding suitable protection. Waiting could mean the difference between life and death. Tornado warnings are normally effective for one hour from the last notification unless indicated by the National Weather Service (NWS). Personnel should remain sheltered until the warning expires or the NWS issues a release. Occupants should listen for severe weather warnings on NWS bands or a local radio station for information if the weather suddenly becomes violent, it begins to hail, or strong wind gusts prohibit safe passage.

Minimum Action to be Taken Based on Specific Weather Alerts:

- Severe Thunderstorm Watch—Be aware that conditions may be ripe for development of a tornado.
- Severe Thunderstorm Warning—Review Severe Weather Action Plans. Usual activities can continue but occupants should be prepared to take shelter. Occupants should avoid going outside, if possible.
- Tornado Watch—Review Severe Weather Action Plans. Personnel should be prepared for impending weather.
- Tornado Warning—Close exterior doors. All personnel should seek weather shelter. Under no circumstances should anyone leave the facility. Seek shelter in a small well-supported room/closet void of windows if possible. Remain seated with backs to the wall and heads protected. Remain as low as possible to reduce potential for injury from glass or flying debris. If available, some form of covering should be used to protect heads, arms and legs.
- Lightning in the area—Avoid high ground, water, open spaces and metal objects. Avoid all metal shelters. Do not congregate with others.

When a Tornado Strikes the Area:

- The NWS will notify when it is safe to assemble
- Assess damage
- Advise the Facility Operator whether business can continue normal operations
- Work with internal and external agencies to coordinate search and rescue operations

5.6 Evacuation Plan

(b) (7)(F), (b) (3)



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6.0 Prevention

The Plan Custodian (identified in **Section 1.6**) is the designated person accountable for discharge prevention who reports to facility management as required by 40 CFR 112.7(f)(2). Contact information is located in **Appendix B**. Due to the prevention measures outlined in this section, the probability of a release occurring at this facility is unlikely.

The facility will conform to all applicable discharge prevention and containment procedures identified in the SPCC Rule, as well as any applicable more-stringent State rules, regulations, and guidelines.

6.1 Secondary Containment

The use of appropriate physical containment and control systems are consistently employed throughout the facility to prevent a discharge from reaching navigable waters or polluting the area immediately surrounding the facility.

6.1.1 General Secondary Containment

The facility's general secondary containment measures address the potential for discharges from all regulated parts of the facility. Containment method, design and capacity are determined by good engineering practice to contain an oil discharge until clean-up occurs. These measures take into consideration **the typical failure mode, and most likely quantity of oil** that would be discharged, consistent with EPA guidance (SPCC Guidance for Regional Inspectors). This facility utilizes both active and passive secondary containment measures to prevent a discharge to navigable waters or adjoining shorelines.

The following *general* secondary containment measures are in place at this facility:

- Curbing or drip pans
- Culverting, gutters, or other drainage systems
- Sorbent materials

6.2 Piping and Valves

Periodically and upon a regular schedule, all aboveground valves and piping associated with transfer operations are inspected for the general condition, evidence of leaks, spills or corrosion and to assure that they are in proper working order. Items such as flange joints, valve glands and bodies, drip pans, pipe supports, bleeder and gauge valves, and other such items are checked for evidence of leaks, spills or corrosion and to assure that they are in proper working order. Piping, valves, and pumps are located within containment areas or in areas where a discharge can be easily collected by facility personnel.

6.2.1 Corrosion Protection

All pipelines appurtenant to the facility are protected from corrosion through protective coatings and/or cathodic protection. If a pipeline is repaired, or if significant corrosion has been detected, that line is tested to ensure integrity. Corrosion protection with coating or cathodic protection is compatible with local soil conditions.

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6.2.2 Pipe Supports

Pipeline supports are designed to minimize abrasion and corrosion and allow for expansion and contraction. U-bolt, clamp, and/or welded pipe saddles are used, as appropriate, to adequately support thrust loadings at bends.

6.2.3 Buried Piping

Buried piping installed or replaced on or after August 12, 2002 has protective wrapping or coating. Buried piping installed or replaced on or after August 12, 2002 is cathodically protected or otherwise satisfies protection standards for piping in 40 CFR part 280 or 281. Exposed buried piping is inspected for deterioration and corrosion damage is corrected. Integrity and leak testing will be conducted on buried piping at time of installation, modification, construction, relocation or replacement

6.2.4 Manifolds and Flowline Testing

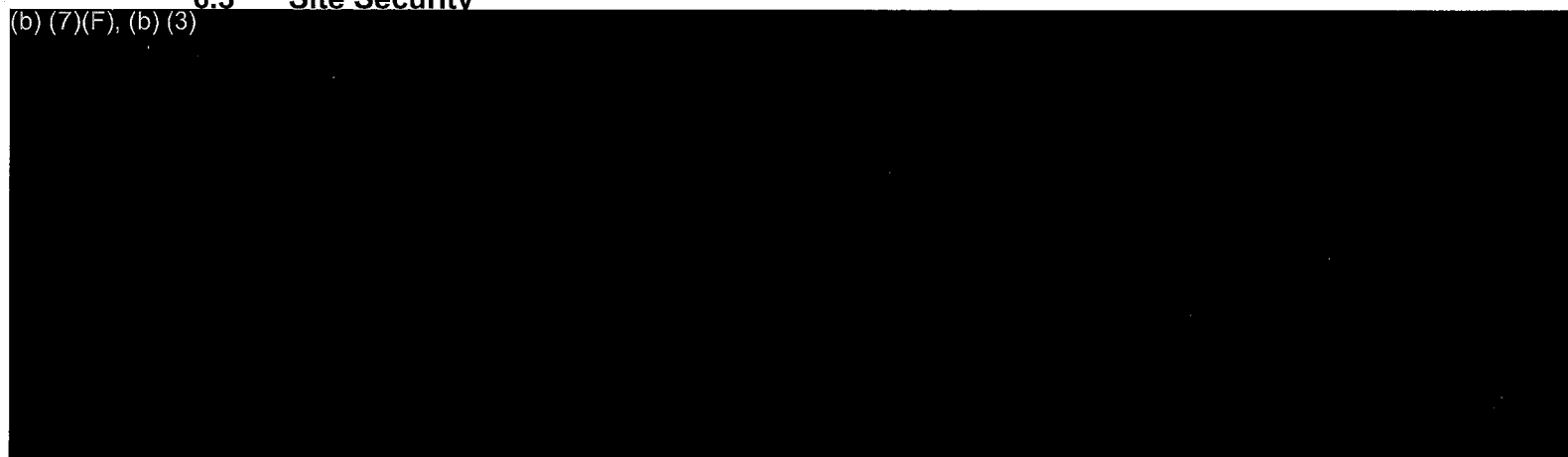
All manifolds have check valves on individual flowlines. This facility has a program of flowline maintenance to prevent discharges from each flowline. Any flowline pressure testing will be conducted in accordance with approved methodology. Tests will be documented and maintained on file for at least five years.

6.2.5 Flowline Overpressure Protection

There are high/low flow line pilots that will shut in each well with an SCSSV, an operated master valve and an operated wing valve. It is standard procedure to cap or blind flange all inactive lines at the facility. This is done to isolate the idle lines from service and thereby prevent any potential oil leakage.

6.3 Site Security

(b) (7)(F), (b) (3)

**6.4 Inspections, Tests, and Records****6.4.1 Weekly Inspections**

Routine visual inspections are conducted weekly, and include the following (if applicable):

- Inspect all vessels for proper operation and condition, including gauges, sight glasses, level controls, pressure controls, and signs of connection leaks.
- Inspect control valve packing and pump packing for leaks.
- Inspect all block valves, unions, flange connections, and piping for leaks.
- Inspect traps and drains, for oil accumulation and proper operation of level controls and pumps.

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- Inspect tank seams, all tanks surfaces, and bases of tanks for leaks and external corrosion.
- Evaluate field-constructed tanks having undergone repair, alteration, reconstruction, or a change in service for risk of failure due to brittle fracture.
- Inspect vent system outlets and gutters to ensure they are not obstructed.
- Inspect area surrounding vessels, piping and facility for oil sheens or accumulations, spilled material, soil discoloration, or stressed vegetation.
- Inspect secondary containment systems for structural integrity and the presence of oil sheens or accumulations.
- Inspect area surrounding secondary containment berm for presence of spilled material, debris, or stressed vegetation.

If the facility is operating in acceptable condition, the inspector will record his/her initials on the Weekly Inspection Log (refer to **FORMS Appendix**). If an inspection reveals that repairs are required, conditions will be reported on the Equipment Maintenance Record (refer to **FORMS Appendix**).

6.4.2 Annual Inspections

Comprehensive facility self-inspections are conducted annually. Facility self-inspection requires two-steps:

1. A checklist of items to inspect
2. A method of recording the actual inspection and its findings. **The records for the FRP are maintained for five years by the operator.**

The following procedures will be included on the checklist (if applicable):

Tank Inspection Checklist

Check tanks for leaks, specifically looking for:

- Drip marks
- Discoloration of tanks
- Puddles containing spilled or leaked materials
- Corrosion
- Cracks
- Localized dead vegetation

Foundation Inspection Checklist

- Cracks
- Discoloration
- Puddles containing spilled or leaked materials
- Settling
- Gaps between tank and foundation
- Damage caused by vegetation roots

Piping Inspection Checklist

- Droplets of stored material
- Discoloration
- Corrosion

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- Bowing of pipe between supports
- Evidence of stored materials seepage from valves or seals
- Localized dead vegetation

Safety Devices

- Test all high-level shutdown devices to ensure proper setting and operation.
- High and Low Level Sensors (LSH and LSL)
- High and Low Pressure Sensors (PSL and PSH)
- Fire Extinguishers
- Pressure safety valves

The Annual Inspection Log will then be completed (refer to **FORMS Appendix**). If an inspection reveals that repairs are required, conditions will be reported on the Equipment Maintenance Record (refer to **FORMS Appendix**).

Records of all equipment inspections will be maintained at the facility or in the corporate office for a period of three years. The Facility Operator, or his/her designee, will conduct an annual review of the plan contents and verify that the field personnel are properly conducting the required equipment inspections/tests and are properly maintaining the required documentation. The annual in-field review will be recorded on the Annual Documentation Review Log (refer to **FORMS Appendix**).

6.5 Preventive Maintenance

Routine visual inspections are conducted weekly by a field operator. Weekly inspection procedures are as follows:

- Inspect all vessels for proper operation and condition, including gauges, sight glasses, level controls, pressure controls, and signs of connection leaks.
- Inspect control valve packing and pump packing for leaks.
- Inspect all block valves, unions, flange connections, and piping for leaks.
- Inspect traps, drains, and sumps for oil accumulation and proper operation of level controls and pumps.
- Inspect tank seams, all tanks surfaces, and bases of tanks for leaks and external corrosion.
- Evaluate field-constructed tanks having undergone repair, alteration, reconstruction, or a change in service for risk of failure due to brittle fracture.
- Inspect vent system outlets and sump piping or gutters to ensure they are not obstructed.
- Inspect secondary containment system for integrity, and surrounding area for oil sheens or accumulations, spilled material, soil discoloration and stressed vegetation.
- Inspect containment for level of precipitation versus available capacity, side and floor permeability, debris, and erosion.

If the facility is operating in acceptable condition, the field supervisor will record his/her initials on the Weekly Inspection Log (refer to **FORMS Appendix**). If an inspection reveals that repairs are required, conditions will be reported on the Maintenance Record (refer to **FORMS Appendix**).

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6.6 Housekeeping

The required inspections are the first line of defense for the prevention of oil and gas discharges from storage facilities. Maintenance of valves, piping, flanges, metal surface of tanks, etc. must be performed when signs of potential failure or excessive corrosion are noted. Additional housekeeping measures are exercised to prevent oil from migrating offsite and are as follows:

- Oily equipment is regularly wiped down with oil absorbent pads to collect free oil and reduce volatilization.
- All oil absorbent materials (stone ground clay and cloth pads) will be collected and disposed of in either sealed plastic bags or metal drums/containers.
- Containers which are used for oil and oil contaminated materials will not be left open to allow for evaporation, or accumulation of storm water.
- The facility will be kept clean of waste materials and loose debris on a daily basis.
- Secondary containment systems will be kept clean of vegetation and brush.

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7.0 Training

The Plan Custodian (identified in **Section 1.6**) is the designated person accountable for discharge prevention who reports to facility management. Contact information is located in **Appendix B**.

Facility response training, drills/exercises, personnel response training, and spill prevention meetings in this section comply with PREP requirements. Training records of all training activities are kept on file for as long as the individual trained is assigned duties under this response plan. **Required Training, drill and exercise frequencies are summarized in Section 1.7.**

7.1 Equipment Training

7.1.1 Operation and Maintenance of Production Equipment

Facility personnel are regularly trained in the operation and maintenance of equipment to prevent discharges; discharge protocols; applicable pollution control laws, rules, and regulations; general facility operations; and the contents of this plan. If new equipment is installed, a qualified representative will train the operations employees. Operations and maintenance manuals are located at the facility.

7.1.2 Operation and Maintenance of Spill Prevention and Control Equipment

Preventative maintenance is scheduled and performed for spill prevention and control equipment in accordance with manufacturer's recommendations and facility personnel operations and maintenance experience. The periodic maintenance of this equipment along with spill exercises provides personnel with a continuing opportunity for "on-the-job" training.

7.2 New Employees

All new employees are briefed on the importance of pollution prevention. Pollution prevention guidelines are reviewed to ensure an adequate understanding of the facility's DOT plan. Specific areas which are covered in the training program sessions are:

- Good general housekeeping with regard to possible oil spillage and discharges
- The function and maintenance of all secondary containment systems
- Transfer operations
- Inspections and countermeasures
- Equipment testing
- Access control and security
- Initial response and spill notification procedures
- Applicable pollution control laws, rules and regulations

7.3 Qualified Individual Training

Training will be conducted for the Qualified Individuals listed in this plan. The training elements may include but are not limited to:

- Notification procedures
- Communication systems
- Information on products carried and/or stored
- Procedures personnel will use to mitigate or prevent any discharge of product
- Capabilities of OSROs
- Responsibilities and authorities of the QI

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- Incident Command System
- Responsibilities of SMT members
- Drill and exercise program to meet regulations
- National Contingency Plan and ACPs applicable to the area of facility
- OSHA requirements for worker health and safety
- Public affairs
- Crisis management
- Salvage operations (if applicable)
- Procedures for obtaining approval for use of dispersants and in-situ burn
- Oil spill trajectory analysis
- Sensitive environmental areas

7.4 Spill Management Team Training

The key to training SMT members is to train them according to their functional role within the response organization. SMT trained contractors function as a coordinated unit, and direct the cleanup activities or preventative measures in an efficient and timely manner.

SMT members are trained in the following areas:

- Notification procedures and requirements
- Communication systems used for notification
- Information on products stored at the facility
- Operational capabilities of the contracted OSROs to respond to a small discharge (average most probable discharge, medium discharge (maximum most probable discharge), and worst case discharge
- Responsibilities and authority of the QI
- Organizational structure that will be used to manage the response actions
- Responsibilities and duties of the SMT member within the organizational structure
- Drill and exercise program to meet federal and state regulations
- Area Contingency Plans
- National Contingency Plan

7.5 Safety Training

Oil spill responders are required to adhere to the training and safety requirements outlined in the OSHA's Hazardous Waste Operations and Emergency Response regulations in 29 CFR 1910.120. Personnel having a potential for minimal exposure to a hazardous substance are required to have 24 hours of initial oil-spill response instruction and eight hours of actual field experience. Those spill responders having potential exposure to a hazardous substance at levels exceeding the permissible exposure limits (generally, those situations requiring the use of a respirator and protective clothing) are required to have 40 hours of initial training off site and 24-hours of actual field experience.

On-site management and supervisors are required to receive the same amount of training as the equipment operators and general laborers, with the addition of eight hours of specialized training in hazardous waste management. Eight hours of annual refresher training are required of both general employees and managers.

Additional safety training may be required depending on duties. This document is not a comprehensive safety plan.

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7.6 Drills and Exercises

A schedule of on-site drills and notification exercises is coordinated by the corporate office. Response drills will comply with the Preparedness for Response Exercise Program (PREP), and the U.S. Coast Guard/Environmental Protection Agency training guidelines for oil spill response.

The plan will be drilled annually. Response drills will be evaluated by a "lessons learned" discussion, by open question and answer sessions, and by response efficiency to actual spills (as applicable). The operator may also include a third party consultant to observe and evaluate response drills.

QI Notification exercises will be conducted quarterly. The Qualified Individual participating in the drill will have no indication that a notification exercise is scheduled. Voice communication must be established between the operator and the QI in order for the exercise to meet requirements.

Required drills, exercises and training frequencies are detailed in **Section 1.7**.

7.7 Wildlife Rescue and Rehabilitation Volunteers

The facility will rely upon the recommendations of the U.S. Fish and Wildlife Service (USFWS) in dealing with oiled wildlife. Only trained personnel, approved by the USFWS, will be utilized to respond to incidents involving oiled wildlife.

7.8 Documentation and Record Maintenance

Drills and Training records will be maintained at the corporate office and onsite. Records are kept on file for as long as the individual trained is assigned duties under this response plan. This documentation will include:

- Annual Spill Management Team training
- Annual facility personnel training
- New employee training
- Safety training in accordance with OSHA-29 CFR 1910.120 Regulations

Documentation of response contractor training, contracted SMT training, and OSRO equipment deployment exercises will be maintained at the respective contractor's office and will be requested by the Operator as necessary.

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8.0 Definitions

Adverse Weather means weather conditions that make it difficult for response equipment and personnel to clean up or remove spilled oil, and that must be considered when identifying response systems and equipment in a response plan for the applicable operating environment. Factors to consider include significant wave height, ice conditions, temperatures, weather-related visibility, and currents within the area in which the systems or equipment is intended to function.

Alteration means any work on a container involving cutting, burning, welding, or heating operations that changes the physical dimensions or configuration of the container.

Captain of the Port Zone (COTP) means a zone specified in 33 CFR Part 3 and the seaward extension of that zone to the outer boundary of the exclusive economic zone (EEZ).

Cleanup means, for the purposes of this document, the removal and/or treatment of oil, hazardous substances, and/or the waste or contaminated materials generated by the incident. Cleanup includes restoration of the site and its natural resources.

Complex means a facility possessing a combination of transportation-related and non-transportation-related components that is subject to the jurisdiction of more than one Federal agency under section 311(j) of the CWA.

Containment Boom means a flotation/freeboard device, made with a skirt/curtain, longitudinal strength member, and ballast unit/weight designed to entrap and contain the product for recovery.

Contiguous Zone means the zone established by the United States under Article 24 of the Convention of the Territorial Sea and Contiguous Zone, that is contiguous to the territorial sea and that extends nine miles seaward from the outer limit of the territorial area.

Contract or Other Approved Means means:

- (1) A written contractual agreement with an oil spill removal organization that identifies and ensures the availability of the necessary personnel and equipment within appropriate response times; and/or
- (2) A written certification by the owner or operator that the necessary personnel and equipment resources, owned or operated by the facility owner or operator, are available to respond to a discharge within appropriate response times; and/or
- (3) Active membership in a local or regional oil spill removal organization that has identified and ensures adequate access through such membership to necessary personnel and equipment to respond to a discharge within appropriate response times in the specified geographic area; and/or
- (4) Any other specific arrangement approved by the Regional Administrator upon request of the owner or operator.

Discharge means, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil, but excludes discharges in compliance with a permit under section 402 of the CWA; discharges resulting from circumstances identified, reviewed, and made a part of the public record with respect to a permit issued or modified under section 402 of the CWA, and subject to a condition in such permit; or continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under section 402 of the CWA, that are caused by events occurring within the scope of relevant operating or treatment systems. The term discharge shall not include any discharge of oil that is authorized by a permit issued under section 13 of the River and Harbor Act of 1899 (33 U.S.C. 407).

Dispersants means those chemical agents that emulsify, disperse, or solubilize oil into the water column or promote the surface spreading of oil slicks to facilitate dispersal of the oil into the water column.

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Diversion Boom means a flotation/freeboard device, made with a skirt/curtain, longitudinal strength member, and ballast unit/weight designed to deflect or divert the product towards a pick up point, or away from certain areas.

Estuary means a unique environment at the mouth of coastal rivers where fresh water and sea water meet, providing important habitat for marine life, birds, and other wildlife.

Exclusive Economic Zone means the zone contiguous to the territorial sea of the United States extending to a distance up to 200 nautical miles from the baseline from which the breadth of the territorial sea is measured.

Facility means any mobile or fixed, onshore or offshore building, property, parcel, lease, structure, installation, equipment, pipe, or pipeline (other than a vessel or a public vessel) used in oil well drilling operations, oil production, oil refining, oil storage, oil gathering, oil processing, oil transfer, oil distribution, and oil waste treatment, or in which oil is used, as described in Appendix A to this part. The boundaries of a facility depend on several site-specific factors, including but not limited to, the ownership or operation of buildings, structures, and equipment on the same site and types of activity at the site. Contiguous or non-contiguous buildings, properties, parcels, leases, structures, installations, pipes, or pipelines under the ownership or operation of the same person may be considered separate facilities. **Only this definition governs whether a facility is subject to the SPCC Rule.**

Fish and Wildlife and Sensitive Environments means areas that may be identified by their legal designation or by evaluations of Area Committees (for planning) or members of the Federal On-Scene Coordinator's spill response structure (during responses). These areas may include wetlands, National and State parks, critical habitats for endangered or threatened species, wilderness and natural resource areas, marine sanctuaries and estuarine reserves, conservation areas, preserves, wildlife areas, wildlife refuges, wild and scenic rivers, recreational areas, national forests, Federal and State lands that are research national areas, heritage program areas, land trust areas, and historical and archaeological sites and parks. These areas may also include unique habitats such as aquaculture sites and agricultural surface water intakes, bird nesting areas, critical biological resource areas, designated migratory routes, and designated seasonal habitats.

Handle means to transfer, transport, pump, treat, process, store, dispose of, drill for, or produce.

Hazardous Substance means any substance designated as such by the Administrator of EPA pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); regulated pursuant to Section 311 of the Federal Water Pollution Control Act (Clean Water Act or FWPCA).

Hazardous Waste means any solid waste identified or listed as a hazardous waste by the Administrator of the EPA pursuant to the federal Solid Waste Disposal Act, as amended by the Resources Conservation and Recovery Act (RCRA), 42 U.S.C., Section 6901, et seq as amended. The EPA Administrator has identified the characteristics of hazardous wastes and listed certain wastes as hazardous in Title 40 of the Code of Federal Regulations, Part 261, Subparts C and D respectively.

Inland Area means the area shoreward of the boundary lines defined on 46 CFR Part 7, except in the Gulf of Mexico. In the Gulf of Mexico, it means the area shoreward of the lines of demarcations (COLREG lines) defined in d80.740 - 80.850 of Title 33 of the CFR. The inland area does not include the Gulf of Mexico.

Maximum Extent Practicable means within the limitations used to determine oil spill planning resources and response times for on-water recovery, shoreline protection, and cleanup for worst case discharges from onshore non-transportation-related facilities in adverse weather. It includes the planned capability to respond to a worst case discharge in adverse weather, as contained in a response plan that meets the requirements in 40 CFR 112.20 or in a specific plan approved by the Regional Administrator.

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Mobile Refueler means a bulk storage container onboard a vehicle or towed, that is designed or used solely to store and transport fuel for transfer into or from an aircraft, motor vehicle, locomotive, vessel, ground service equipment, or other oil storage container.

National Contingency Plan means the plan prepared under the Federal Water Pollution Control Act (33 United State Code § 1321 et seq) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 United State Code § 9601 et seq), as revised from time to time.

Natural Resource means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to or otherwise controlled by the state, federal government, private parties, or a municipality.

Navigable Waters of the United States means "navigable waters" as defined in section 502(7) of the FWPCA, and includes:

- (1) All navigable waters of the United States, as defined in judicial decisions prior to passage of the 1972 Amendments to the FWPCA (Pub. L. 92-500), and tributaries of such waters;
- (2) Interstate waters;
- (3) Intrastate lakes, rivers, and streams which are utilized by interstate travelers for recreational or other purposes; and
- (4) Intrastate lakes, rivers, and streams from which fish or shellfish are taken and sold in interstate commerce.

Nearshore Area means the area extending seaward 12 miles from the boundary lines defined in 46 CFR Part 7, except in the Gulf of Mexico. In the Gulf of Mexico, it means the area extending seaward 12 miles from the line of demarcation (COLREG) lines defined in d80.740 - 80.850 of Title 33 of the CFR.

Non-persistent or Group I Oil means petroleum-based oil that, at the time of shipment, consists of hydrocarbon fractions:

- (1) At least 50% of which by volume, distill at a temperature of 340°C (645°F)
- (2) At least 95% of which by volume, distill at a temperature of 370°C (700°F)

Offshore Area means the area beyond 12 nautical miles measured from the boundary lines defined in 46 CFR Part 7 extending seaward to 50 nautical miles, except in the Gulf of Mexico. In the Gulf of Mexico it is the area beyond 12 nautical miles of the line of demarcation (COLREG lines) defined in d80-740 - 80.850 of Title 33 of the CFR extending seaward to 50 nautical miles.

Offshore Facility means any facility of any kind (other than a vessel or public vessel) located in, on, or under any of the navigable waters of the United States, and any facility of any kind that is subject to the jurisdiction of the United States and is located in, on, or under any other waters.

Oil means oil of any kind or in any form, including, but not limited to: fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and, other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.

Oil-filled Operational Equipment means equipment that includes an oil storage container (or multiple containers) in which the oil is present solely to support the function of the apparatus or the device. Oil-filled operational equipment is not considered a bulk storage container, and does not include oil-filled manufacturing equipment (flow-through process). Examples of oil-filled operational equipment include, but are not limited to, hydraulic systems, lubricating systems (e.g., those for pumps, compressors and other rotating equipment, including pumpjack lubrication systems), gear boxes, machining coolant

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systems, heat transfer systems, transformers, circuit breakers, electrical switches, and other systems containing oil solely to enable the operation of the device.

Oil Spill Removal Organization means an entity that provides oil spill response resources, and includes any for-profit or not-for-profit contractor, cooperative, or in-house response resources that have been established in a geographic area to provide required response resources.

Oily Waste means oil contaminated waste resulting from an oil spill or oil spill response operations.

Onshore Facility means any facility of any kind located in, on, or under any land within the United States, other than submerged lands.

Operating Area means the rivers and canals, inland, nearshore, or offshore geographic location(s) in which a facility is handling, storing, or transporting oil.

Operating Environment means rivers and canals, inland, or ocean. These terms are used to define the conditions in which response equipment is designed to function.

Owner or Operator means any person owning or operating an onshore facility or an offshore facility, and in the case of any abandoned offshore facility, the person who owned or operated or maintained the facility immediately prior to such abandonment.

Persistent Oil means a petroleum-based oil that does not meet the distillation criteria for a non-persistent oil. Persistent oils are further classified based on specific gravity as follows:

- (1) Group II—specific gravity less than .85
- (2) Group III—specific gravity between .85 and less than .95
- (3) Group IV—specific gravity .95 to and including 1.0
- (4) Group V—specific gravity greater than 1.0

Petroleum Oil means petroleum in any form, including but not limited to crude oil, fuel oil, mineral oil, sludge, oil refuse, and refined products.

Qualified Individual(s) means an English-speaking representative(s) of the facility identified in the plan, located in the United States, available on a 24-hour basis, familiar with implementation of the facility response plan, and trained in his or her responsibilities under the plan. This person must have full written authority to implement the facility's response plan. This includes:

- (1) Activating and engaging in contracting with identified oil spill removal organization(s)
- (2) Acting as a liaison with the pre-designated Federal On-Scene Coordinator (FOCS); and
- (3) Obligating, either directly or through prearranged contracts, funds required to carry out all necessary or directed response activities

Regional Administrator means the Regional Administrator of the Environmental Protection Agency, in and for the Region in which the facility is located.

Regional Response Team means the federal response organization (consisting of representatives from selected federal and state agencies) which acts as a regional body responsible for planning and preparedness before an oil spill occurs and providing advice to the FOSC in the event of a major or substantial spill.

Response Resources means the personnel, equipment, supplies, and other material necessary to perform the response activities identified in a response plan.

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Responsible Party means any person, owner/operator, or facility that has control over an oil or hazardous substance immediately before entry of the oil or hazardous substance into the atmosphere or in or upon the water, surface, or subsurface land of the state.

Rivers and Canals means a body of water confined within the inland area that has a projected depth of 12 feet or less, including the Intracoastal Waterway and other waterways artificially created for navigation.

Skimmers means mechanical devices used to skim the surface of the water and recover floating oil. Skimmers fall into four basic categories (suction heads, floating weirs, oleophilic surface units, and hydrodynamic devices) which vary in efficiency depending on the type of oil and size of spill.

Sorbents means materials ranging from natural products to synthetic polymeric foams placed in confined areas to soak up small quantities of oil. Sorbents are very effective in protecting walkways, boat decks, working areas, and previously uncontaminated or cleaned areas.

Spill Management Team means the personnel identified to staff the organizational structure identified in a response plan, and to manage response plan implementation.

Spill Response Personnel means federal, state, local agency, and contract personnel responsible for participating in or otherwise involved in spill response. All spill response personnel will be pre-approved on a list maintained in the response plan.

Staging Areas means designated areas near the spill site accessible for gathering and deploying equipment and/or personnel.

Transportation-related and Non-transportation-related, as applied to an onshore or offshore facility, are defined in the 1971 Memorandum of Understanding between the Secretary of Transportation and the Administrator of the Environmental Protection Agency (Appendix A of 40 CFR 112).

Unified Command means the method by which local, state, and federal agencies and the responsible party will work with the Incident Commander to:

- Determine their roles and responsibilities for a given incident
- Determine their overall objectives for management of an incident
- Select a strategy to achieve agreed upon objectives
- Deploy resources to achieve agreed-upon objectives

Waste means oil or contaminated soil, debris, and other substances removed from coastal waters and adjacent waters, shorelines, estuaries, tidal flats, beaches, or marshes in response to an unauthorized discharge. Waste means any solid, liquid, or other material intended to be disposed of or discarded and generated as a result of an unauthorized discharge of oil. Waste does not include substances intended to be recycled if they are in fact recycled within 90 days of their generation or if they are brought to a recycling facility within that time.

Wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include playa lakes, swamps, marshes, bogs, and similar areas such as sloughs, prairie potholes, wet meadows, prairie river overflows, mudflats, and natural ponds.

Wildlife Rescue means efforts made in conjunction with federal and state agencies to retrieve, clean, and rehabilitate birds and wildlife affected by an oil spill.

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9.0 Acronyms

ACP—Area Contingency Plan
 BOEM – Bureau of Ocean Energy Management
 CFR—Code of Federal Regulations
 COTP—Captain of the Port
 DNR—Department of Natural Resources (Louisiana)
 DPRP—Discharge Prevention and Response Plan (Texas)
 EPA—Environmental Protection Agency
 ERAP—Emergency Response Action Plan
 FAA—Federal Aviation Administration
 FOSC—Federal On-Scene Coordinator
 FRP—Facility Response Plan (EPA, USCG, or DOT)
 GIS—Geographic Information System
 GLO—General Land Office
 GLO-PIC—General Land Office designation for Qualified Individual
 HAZWOPER—Hazardous Waste Operations and Emergency Response
 IAP—Incident Action Plan
 IC—Incident Commander
 ICP—Integrated Contingency Plan, Incident Command Post
 ICS—Incident Command System
 JIC—Joint Information Center
 LDEQ—Louisiana Department of Environmental Quality
 LOSCO—Louisiana Oil Spill Coordinator's Office
 NIMS—National Incident Management System
 MSDS—Material Safety Data Sheets
 MSU—Marine Safety Unit
 MTR—Marine Transportation-Related
 NOAA—National Oceanic and Atmospheric Administration
 NOW—Non-hazardous Oilfield Waste
 NRC—National Response Center
 OPA 90—Oil Pollution Act of 1990
 OSRO—Oil Spill Removal Organization
 OSRP—Oil Spill Response Plan
 OSPRA—Oil Spill Prevention and Response Act (Texas Administrative Code)
 OSHA—Occupational Safety and Health Administration
 PE—Professional Engineer
 PHMSA —Pipeline and Hazardous Materials Safety Administration
 PIC—Person In Charge (USCG)

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PPE—Personal Protective Equipment
PREP—Preparedness for Response Exercise Program
QI—Qualified Individual
RCRA—Resource Conservation and Recovery Act of 1976
RP—Responsible Party
SMT—Spill Management Team
SOSC—State On-Scene Coordinator
SPCC—Spill Prevention, Control, and Countermeasure
SPC—Spill Prevention Control Plan (Louisiana)
TOM—Transfer Operations Manual (USCG)
USCG—United States Coast Guard
USFWS—United States Fish and Wildlife Service
VRP—Vessel Response Plan (USCG)

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10.0 Cross References

10.1 DOT, PHMSA—FRP

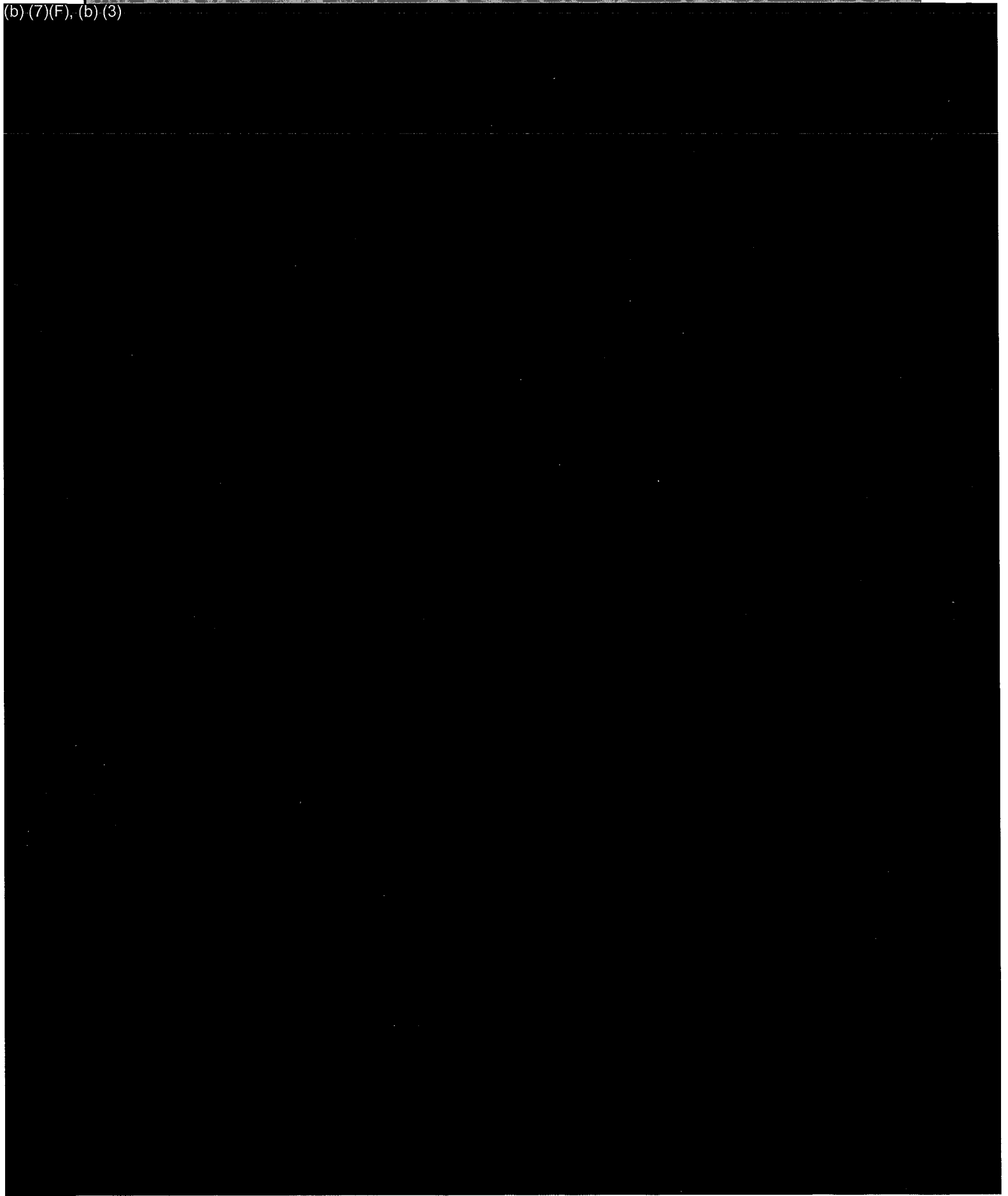
Oil Spill Response Plan (49 CFR 194)		Plan Reference
194.103 (a)	Each operator shall submit a statement with its response plan identifying which line sections in a response zone can be expected to cause significant and substantial harm to the environment in the event of a discharge of oil into navigable waters or adjoining shorelines.	Section 2.3
194.105 (a)	Each operator shall determine the worst case discharge for each of its response zones and provide the methodology, including calculations, used to arrive at the volume.	Section 2.5
194.107 (a)	Each response plan must plan for resources for responding, to the maximum extent practicable, to a worst case discharge, and to a substantial threat of such a discharge.	Section 2.9
194.107 (b)	Each response plan must be consistent with the NCP and each applicable ACP.	Section 1.2
194.107 (c)(1)(i)	Must include an information summary as required in 194.113	Section 2.0
194.107(c)(1)(ii)	Immediate notification procedures	Section 3.3
194.107(c)(1)(iii)	Spill detection and mitigation procedures	Sections 3.1, 3.2 and 4.0
194.107(c)(1)(iv)	Name, address, and telephone number of the OSRO	Quick Reference Guide; Section 2.8; Appendix B
194.107(c)(1)(v)	Response activities and response resources.	Sections 2.6 and 4.0
194.107(c)(1)(vi)	Names and telephone numbers of Federal, State and local agencies which the operator expects to have pollution control responsibilities or support.	Quick Reference Guide; Section 3.3 and Appendix B
194.107(c)(1)(vii)	Training procedures.	Section 7.0
194.107(c)(1)(viii)	Equipment testing	Sections 2.6 and 6.4
194.107(c)(1)(ix)	Drill types, schedules, and procedures	Sections 1.7 and 7.0
194.107(c)(2)	An appendix for each response zone including all information from 194.107(c)(1)(i-ix)	Section 2.9
194.111	Plan must be retained at operator's headquarters, with each QI and in the field at other locations from which response activities may be conducted.	Section 1.3

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Oil Spill Response Plan (49 CFR 194)		Plan Reference
194.113(a)(1)	Name and address of the operator	Section 2.1
194.113(a)(2)	A listing of each response zone, including county and state.	Section 2.9
194.113(b)(2)	Name and telephone number of the QI available on a 24-hour basis and at least one alternate QI.	Section 2.2
194.113(b)(4)	A list of line sections for each pipeline contained in the response zone, identified by milepost or survey station number, or other operator designation	Section 2.1.1
194.113(b)(5)	Basis for the operator's determination of significant and substantial harm	Section 2.3
194.113(b)(6)	Type of oil and volume of the worst case discharge.	Sections 2.1, 2.5, and 4.6.3
194.115(a)	Identify and ensure, by contract or other approved means, the resources necessary to remove, to the maximum extent practicable, a worst case discharge and to mitigate or prevent a substantial threat of a worst case discharge.	Section 2.7
194.115(b)	Identify the response resources which are available to respond within the time specified, after discovery of a WCD or to mitigate the substantial threat of such a discharge with the appropriate tier times.	Section 2.7
194.117(a)(1)	Each operator shall conduct training to ensure that all personnel know their responsibilities under the plan, name and address and procedure for contacting the operator on a 24 hour basis, name and procedures for contacting the QI on a 24 hour basis	Sections 1.7 and 7.0
194.117(a)(2)	Reporting personnel must know the content of the information summary of the plan, the NRC phone number and notification process.	Section 4.2
194.117(a)(3)	Personnel engaged in response activities must know the characteristics and hazards of the oil discharged, the conditions that are likely to worsen emergencies, including the consequences of facility malfunctions or failures, and the appropriate corrective actions, steps necessary to control any accidental discharge of oil and to minimize the potential for fire, explosion, toxicity, or environmental damage, and proper firefighting procedures and use of equipment, fire suits, and breathing apparatus.	Sections 5.0 and Appendix D
194.117(b)	Operator shall maintain a training record for each individual that has been trained as required by this plan.	Section 7.8

Nautilus Gas Pipeline System

(b) (7)(F), (b) (3)



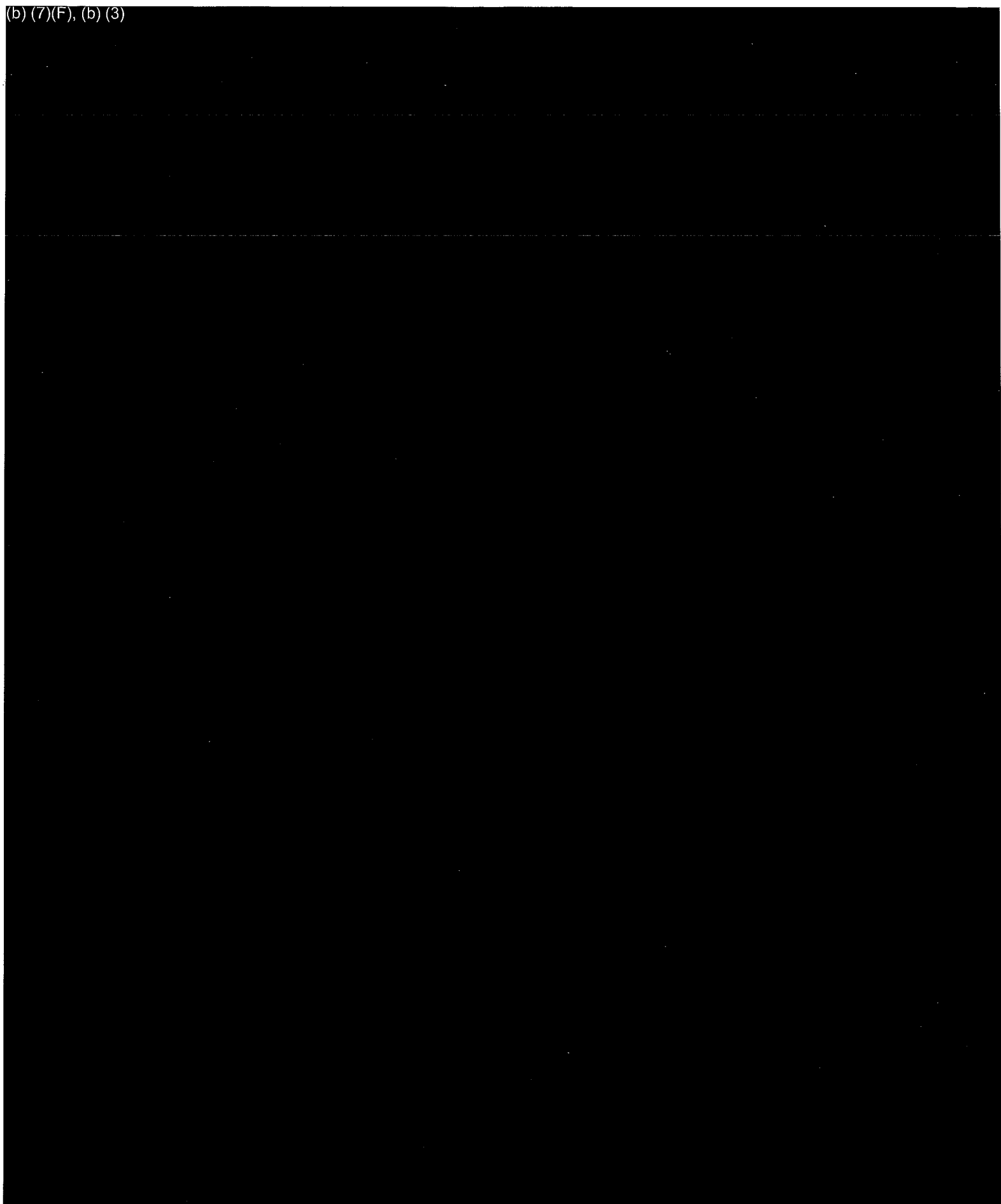
(b) (7)(F), (b) (3)

Nautilus Pipeline
Community

ENBRIDGE
30" Pipeline
Nautilus Gas Pipeline System
St. Mary Parish, Louisiana



(b) (7)(F), (b) (3)



Nautilus Pipeline
Community

ENBRIDGE
30" Pipeline
Nautilus Gas Pipeline System
St. Mary Parish, Louisiana



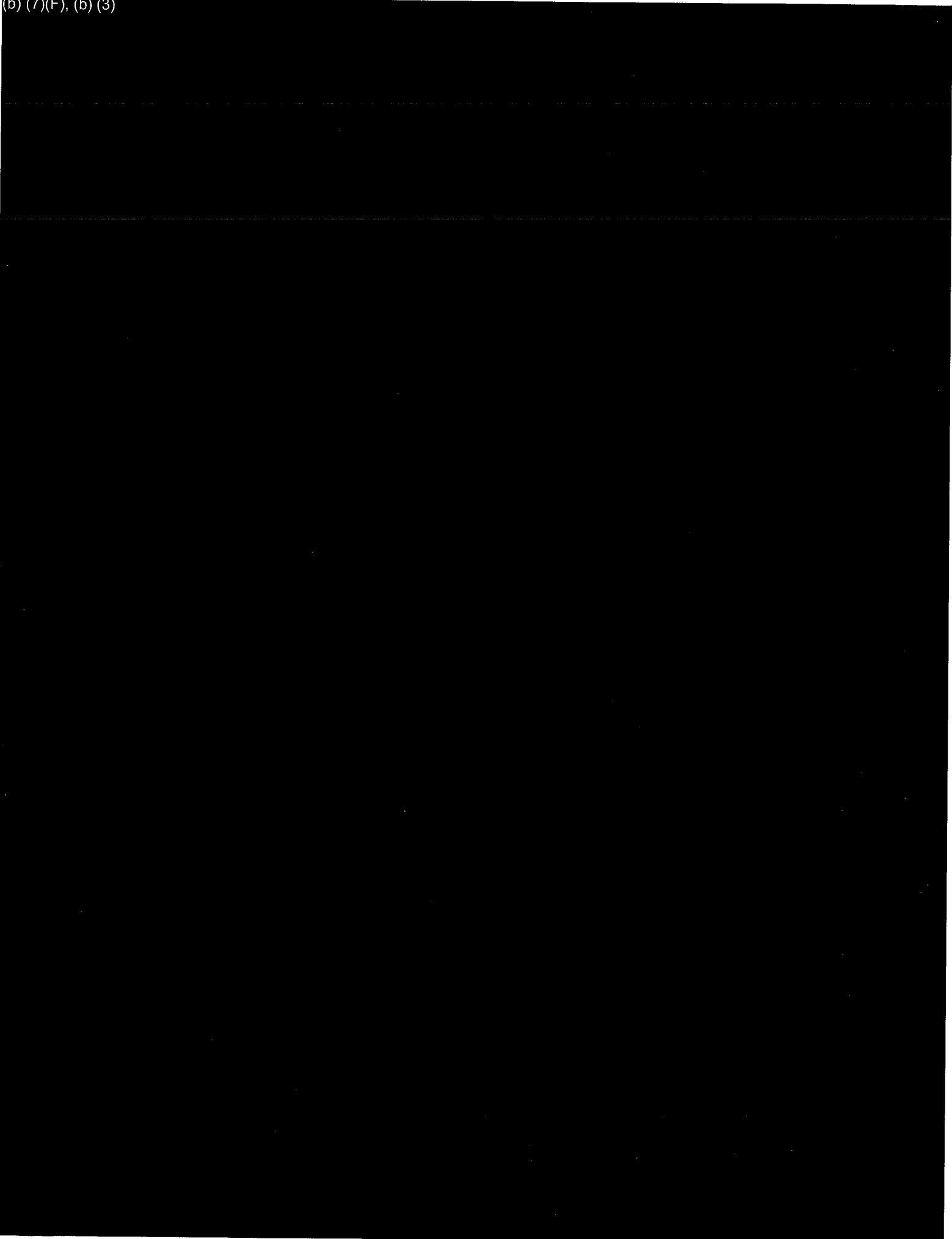
(b) (7)(F), (b) (3)

NAUTILUS 30" GAS EXPORT PIPE LINE NORTH HULF OPERATIONS AND RESPONSE MAP		DATE OF CCT 10/1/04 TIME OF DAY 12:00 MONTH OCT YEAR 2004
NAUTILUS PIPELINE COMPANY, L.L.C. 6555 SAN FELIPE HOUSTON TEXAS IS A SERVICE CONTRACTOR TO  Marathon Oil Company	HOUSTON TEXAS	
GULF COAST DISTRICT		
12/22/04 12:00 PM REVISION		

(b) (7)(F),
(b) (3)

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

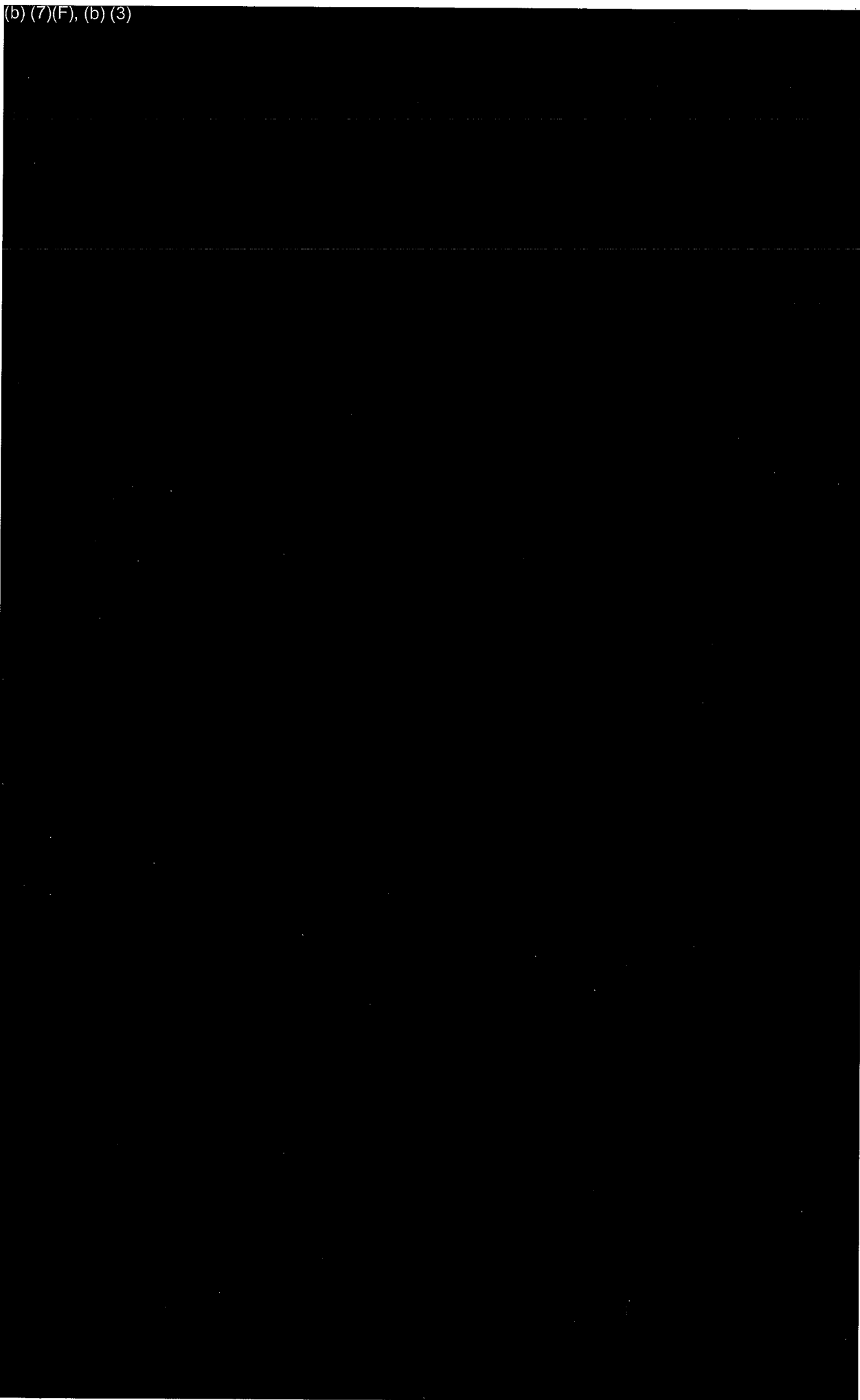


(b) (7)(F), (b) (3)

NAUTILUS / MANTA RAY GARDEN CITY FACILITY

PL\OPL\ 069 \ 069C0063.DGN 4/5/00

(b) (7)(F), (b) (3)



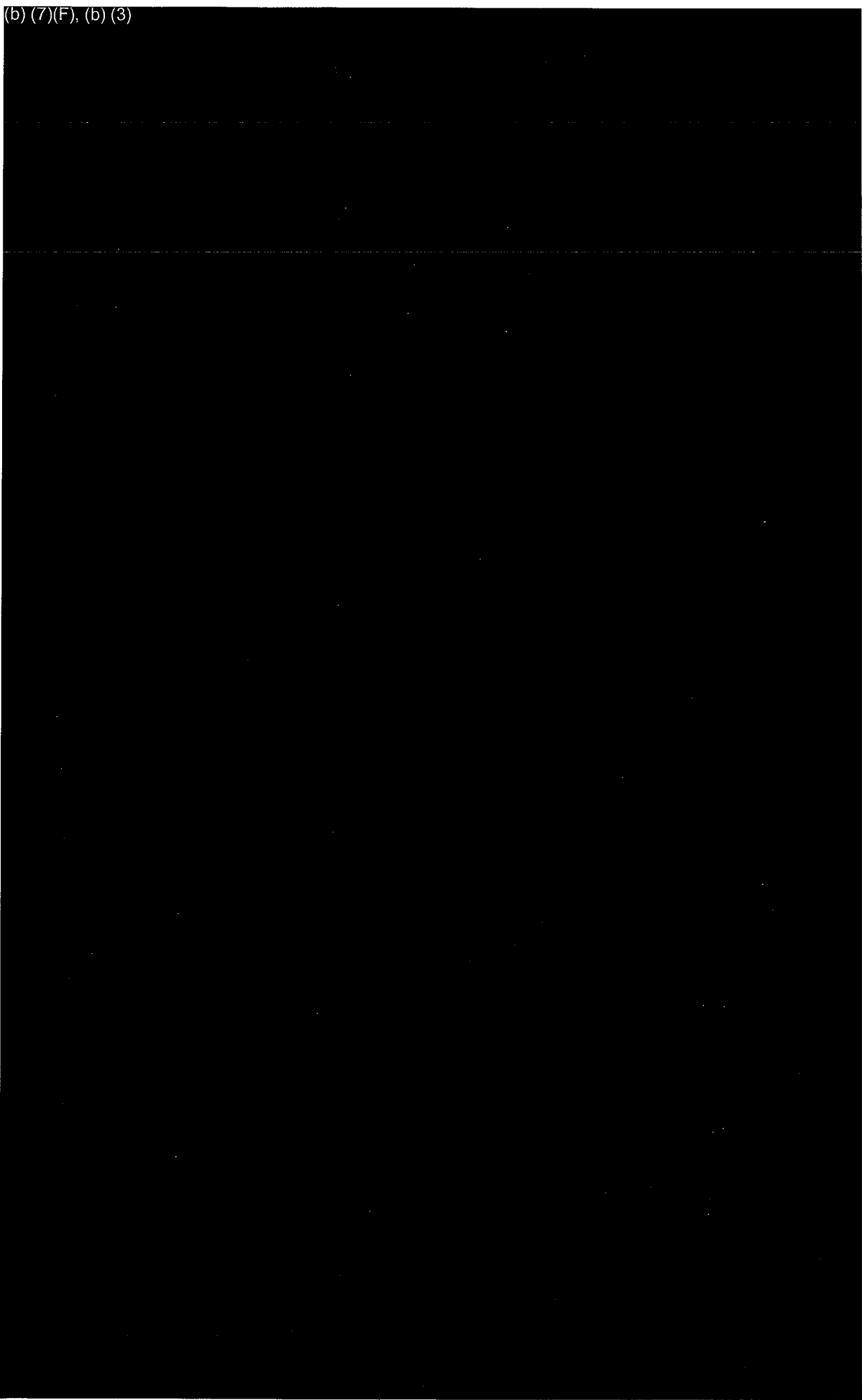
● Fire extinguisher

Garden City Terminal

EMERGENCY

Sheet 1 of 2

(b) (7)(F), (b) (3)



Fire extinguisher

Garden City Terminal

ENBRIDGE

Sheet 2 of 2

(b) (7)(F), (b) (3)



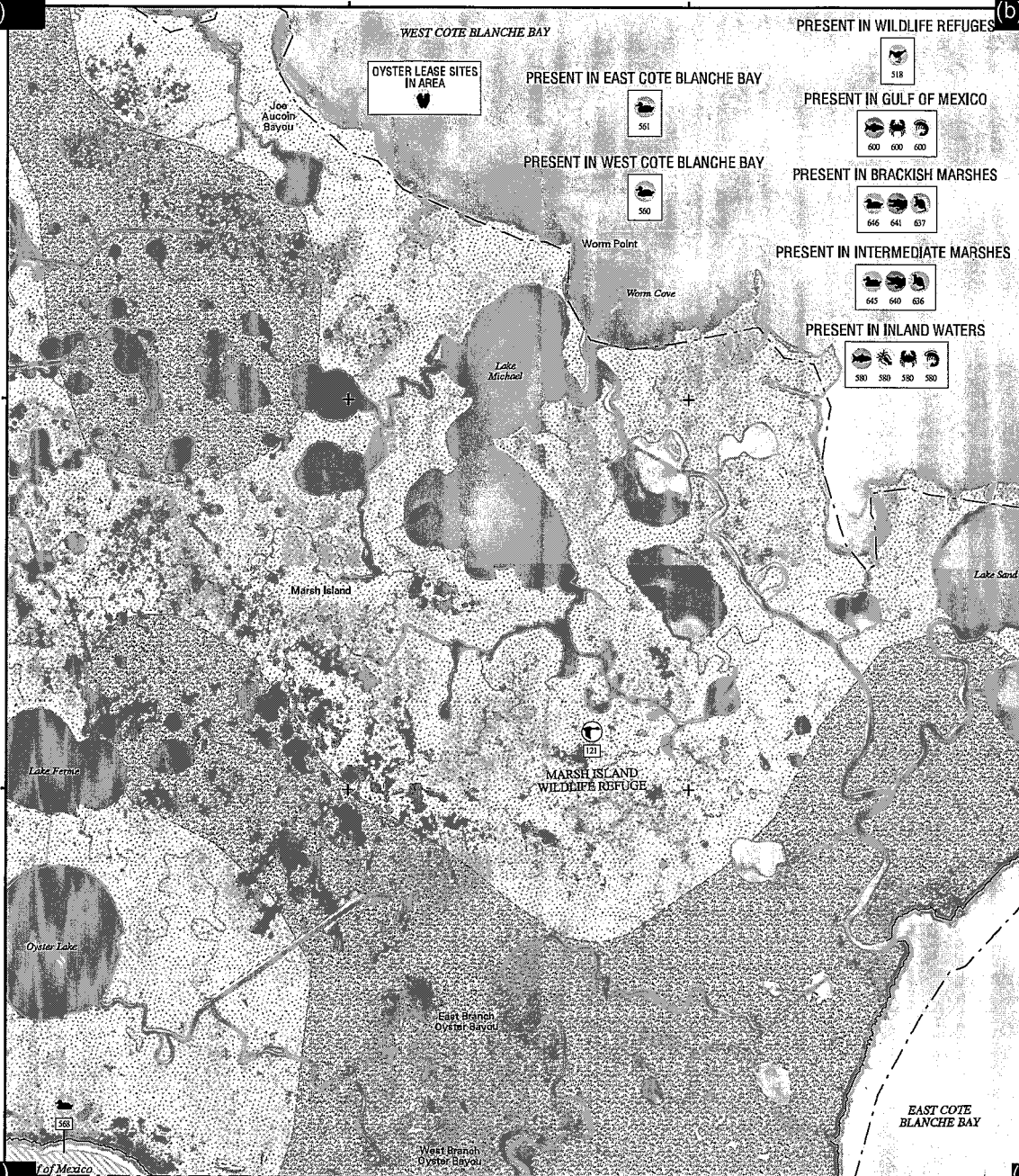
Evacuation Routes

-  First Aid / Blood Burn Path Kit
-  Fire Extinguisher

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)(F),
(b) (3)

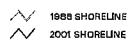
(b) (7)(F),
(b) (3)



(b) (7)
(F), (b)

(b) (7)
(F), (b)

SHORELINE



SHORELINE HABITATS (ESI)
2001 ESI Shoreline Classification

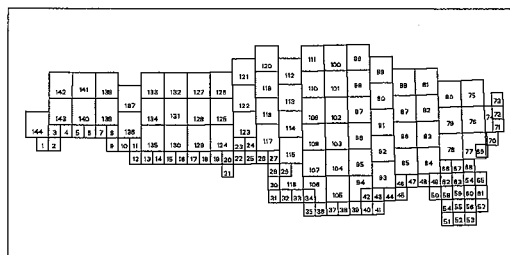
	1B EXPOSED, SOLID MAN-MADE STRUCTURES	
	2A EXPOSED WAVE-CUT PLATFORMS IN CLAY	
	2B EXPOSED SCARPS AND STEEP SLOPES IN CLAY	
	3A FINE-TO MEDIUM-GRAINED SAND BEACHES	
	3B SCARPS AND STEEP SLOPES IN SAND	
	4 COARSE-GRAINED SAND BEACHES	
	5 MIXED SAND AND GRAVEL BEACHES	
	6A GRAVEL BEACHES	
	6B RIPRAP	
	7 EXPOSED TIDAL FLATS	
	8A SHELTERED ROCKY SHORES AND SHELTERED SCARPS IN MUD OR CLAY	
	8B SHELTERED, MAN-MADE STRUCTURES	
	8C SHELTERED RIPRAP	
	9A SHELTERED TIDAL FLATS	
	9B SHELTERED, VEGETATED LOW BANKS	
	10A SALT- AND BRACKISH-WATER MARSHES	
	10B FRESHWATER MARSHES	
	10C FRESHWATER SWAMPS	
	10D SCRUB-SHRUB WETLANDS	

NOTE FOR COASTAL MAPS:

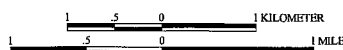
Due to the dynamic nature of the Louisiana coastline, biological resources may represent historical locations that do not correspond with the depicted shoreline.

COASTAL HABITATS
Based on 1988 Digital Shoreline

-  10A SALT MARSH
 10A BRACKISH MARSH
 10A INTERMEDIATE MARSH
 10B FRESHWATER MARSH
 10C FORESTED WETLAND
 10D SCRUB-SHRUB WETLAND
 SEAGRASS



SCALE 1:50000



Not For Navigation

December 2003
Published at Seattle, Washington
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Hazardous Materials Response Division

BAYOU BLANC LA-20

Louisiana ESI: ESIMAP 20

BIOLOGICAL RESOURCES:

BIRD:																					
RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting		
518	Shorebirds									X	X	X	X	X	X		-	-	-		
560	Lesser scaup	13		IND/SQ MI	X	X	X			X	X	X	X	X	X		-	-	-		
561	Lesser scaup	113		IND/SQ MI	X	X	X						X	X	X		-	-	-		
568	Lesser scaup	52		IND/SQ MI	X	X	X						X	X	X		-	-	-		
645	American coot	33		TO 165 IND/SQ MI	X	X	X						X	X	X		-	-	-		
	American wigeon	3		TO 73 IND/SQ MI	X	X	X	X					X	X	X		-	-	-		
	Blue-winged teal	9		TO 34 IND/SQ MI	X	X	X	X	X				X	X	X	X	-	-	-		
	Canvasback	UP		TO 6 IND/SQ MI	X	X	X						X	X			-	-	-		
	Gadwall	36		TO 240 IND/SQ MI	X	X	X	X					X	X	X		-	-	-		
	Green-winged teal	9		TO 144 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-		
	Hooded merganser	PRESENT			X	X	X						X	X			-	-	-		
	Lesser scaup	2		TO 35 IND/SQ MI	X	X	X						X	X	X		-	-	-		
	Mallard	4		TO 66 IND/SQ MI	X	X	X						X	X	X		-	-	-		
	Mottled duck	8		TO 15 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-		
	Northern pintail	UP		TO 39 IND/SQ MI	X	X	X						X	X	X	X	-	-	-		
	Northern shoveler	4		TO 34 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-		
	Ring-necked duck	2		TO 36 IND/SQ MI	X	X	X						X	X	X		-	-	-		
646	American coot	4		TO 42 IND/SQ MI	X	X	X						X	X	X		-	-	-		
	American wigeon	5		TO 39 IND/SQ MI	X	X	X	X					X	X	X		-	-	-		
	Blue-winged teal	9		TO 21 IND/SQ MI	X	X	X	X	X				X	X	X	X	-	-	-		
	Canvasback	UP		TO 8 IND/SQ MI	X	X	X						X	X			-	-	-		
	Gadwall	46		TO 167 IND/SQ MI	X	X	X	X					X	X	X		-	-	-		
	Green-winged teal	23		TO 70 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-		
	Hooded merganser	UP		TO 1 IND/SQ MI	X	X	X						X	X			-	-	-		
	Lesser scaup	2		TO 10 IND/SQ MI	X	X	X						X	X	X		-	-	-		
	Mallard	3		TO 19 IND/SQ MI	X	X	X						X	X	X		-	-	-		
	Mottled duck	7		TO 17 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-		
	Northern pintail	1		TO 56 IND/SQ MI	X	X	X						X	X	X	X	-	-	-		
	Northern shoveler	6		TO 31 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-		
	Ring-necked duck	UP		TO 14 IND/SQ MI	X	X	X						X	X	X	X	-	-	-		
FISH:																					
RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Atlantic croaker	5			5	5	5	5	5	5	5	4	4	4	5	5	MAR-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5			5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3			3	3	3	3	3	3	3	3	3	3	3	3	JAN-MAY	JAN-MAY	JAN-MAY	JAN-DEC	-
	Crevalle jack	3			2	2	3	3	3	3	3	3	3	3	2		-	-	-	JAN-DEC	-
	Florida pompano	3			3	3	3	3	3	3	3	3	3	3	3	3	MAY-AUG	MAY-AUG	MAY-AUG	JAN-DEC	-
	Gizzard shad	4			3	3	3	4	4	4	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper	3			2	2	2	2	3	3	3	3	3	2			-	-	-	JAN-DEC	-
	Gulf menhaden	5			5	5	5	5	5	5	5	5	5	5	5	5		AUG-APR	AUG-APR	JAN-DEC	-
	Red drum	4			3	3	3	3	3	4	4	4	3	3	3	3	AUG-MAR	AUG-MAR	AUG-MAR	JAN-DEC	-
	Sand seatrout	4			3	3	3	3	4	4	4	4	4	3	3	3	FEB-OCT	FEB-OCT	FEB-OCT	JAN-DEC	-
	Sheepshead	4			4	4	4	4	4	4	4	4	4	4	4	4		JAN-JUL	JAN-DEC	-	
	Silver perch	4			3	3	3	3	4	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Southern flounder	4			3	3	3	3	4	4	4	4	4	4	3		-	-	SEP-APR	JAN-DEC	-
	Spanish mackerel	3			2	2	3	3	3	3	3	3	3	2			-	-	-	JAN-DEC	-
	Spot	5			5	5	5	5	5	5	5	5	5	5	5	5	OCT-APR	OCT-APR	OCT-APR	JAN-DEC	-
	Spotted seatrout	4			3	3	3	3	4	4	4	4	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet	4			4	4	4	4	4	4	4	4	4	4	4	4	-	NOV-FEB	OCT-MAY	JAN-DEC	-
	Tarpon	3			2	2	2	2	3	3	3	3	3	2			-	MAY-NOV	JAN-DEC	-	
600	Black drum	4			4	4	4	4	4	4	4	4	4	4	4	4	JAN-DEC	DEC-MAY	JAN-DEC	JAN-DEC	-
	Florida pompano	2			2	2	2	2	2	2	2	2	2	2	2	2	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf menhaden	5			5	5	4	4	4	5	5	5	5	5	5	5	JAN-DEC	SEP-MAY	JAN-DEC	JAN-DEC	-
	Gulf sturgeon	T 2			2	2	2	2	2	0	0	0	0	0	2		JAN-DEC	-	JAN-DEC	JAN-DEC	-
	Red drum	4			4	4	4	4	4	4	4	4	4	4	4	4	JAN-DEC	SEP-FEB	JAN-DEC	JAN-DEC	-
	Sheepshead	4			4	4	4	4	4	4	4	4	4	4	4	4	JAN-DEC	DEC-MAY	JAN-DEC	JAN-DEC	-
	Southern flounder	4			3	3	4	4	4	4	4	4	4	3	3	3	JAN-DEC	SEP-FEB	JAN-DEC	JAN-DEC	-
	Spanish mackerel	4			2	2	3	3	3	4	4	4	4	4	2	2	JAN-DEC	MAR-NOV	JAN-DEC	JAN-DEC	-
	Spotted seatrout	3			3	3	3	3	3	3	3	3	3	3	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped mullet	4			3	3	4	4	4	4	4	3	3	3	3	3	JAN-DEC	-	JAN-DEC	JAN-DEC	-
	Tarpon	3			2	2	2	2	3	3	3	3	3	3	2		JAN-DEC	-	JAN-DEC	JAN-DEC	-
INVERTEBRATE:																					
RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Bay squid	4			4	4	4	4	4	4	4	4	4	4	4	4	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Blue crab	5			4	4	5	5	5	5	5	5	5	5	4		-	-	-	JAN-DEC	-
	Brown shrimp	5			4	4	5	5	5	5	5	5	4	4	3		JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3			3	3	3	3	3	3	3	3	3	3	3	3	-	MAR-NOV	MAR-DEC	JAN-DEC	-
	Pink shrimp	5			3	3	5	5	5	3	3	3	3	3	3	3	-	-	APR-OCT	JAN-DEC	-
	White shrimp	5			3	3	5	5	5	5	5	5	5	5	4		APR-NOV	APR-NOV	MAR-DEC	JAN-DEC	-
600	Blue crab	5			4	4	4	4	5	5	5	5	4	4	3		JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5			3	3	4	4	4	5	5	4	4	3	3		JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Florida stone crab	2			2	2	2	2	2	2	2	2	2	2	2		JAN-DEC	MAR-NOV	JAN-DEC	JAN-DEC	-
	Gulf stone crab	2			2	2	2	2	2	2	2	2	2	2	2		JAN-DEC	MAR-NOV	JAN-DEC	JAN-DEC	-
	Pink shrimp	4			3	3	3	3	4	4	4	4	4	3	3		JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White shrimp	5			4	4	4	4	4	5	5	5	5	5	4		JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
REPTILE:																					
RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Internesting	Juveniles	Adults
640	American alligator	593		TO 38 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
641	American alligator	2257		TO 68 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
TERRESTRIAL MAMMAL:																					
RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Internesting	Juveniles	Adults
636	Common raccoon	77		TO 73 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Mink	329		TO 220 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Muskrat	99		TO 6 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Northern river otter	1258		TO 423 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Nutria	6		TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
637	Common raccoon	68		TO 43 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Mink	466		TO 215 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Muskrat	9		TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Northern river otter	752		TO 373 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Nutria	7		TO 5 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Louisiana ESI: ESIMAP 20 (cont.)

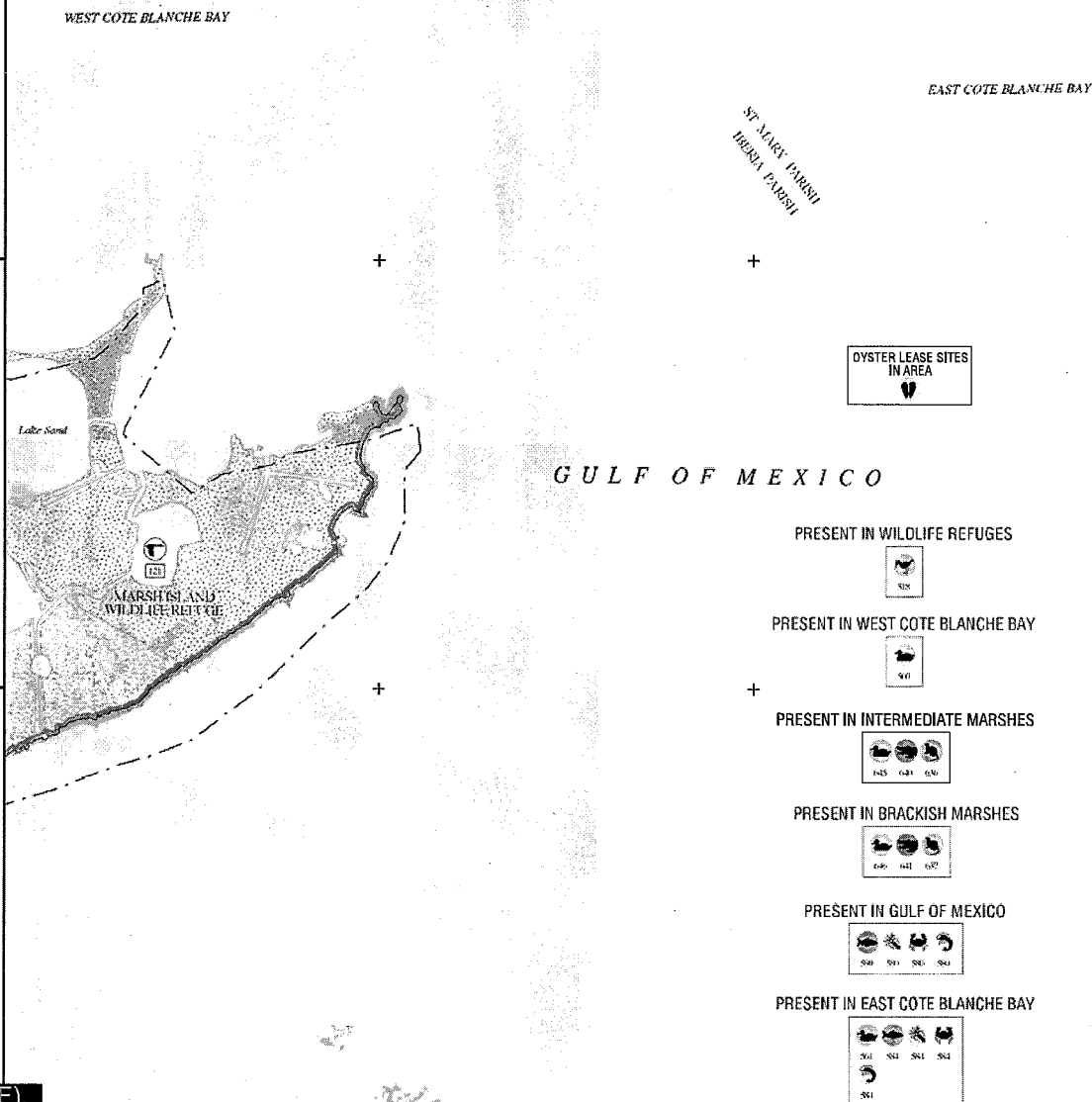
HUMAN USE RESOURCES:

WILDLIFE REFUGE:

HUN#	Name	Owner	Contact	Phone
121	MARSH ISLAND WMA		LDWF	

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)

SHORELINE

2001 SHORELINE

NOTE FOR COASTAL MAPS:

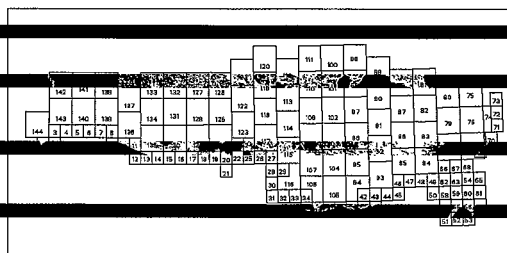
Due to the dynamic nature of the Louisiana coastline, biological resources may represent historical locations that do not correspond with the depicted shoreline.

SHORELINE HABITATS (ESI)
2001 ESI Shoreline Classification

- 1A EXPOSED, SOFT, MAN-MADE STRUCTURES
- 2A EXPOSED WAVE-CUT PLATFORMS IN CLAY
- 2B EXPOSED SCARPS AND STEEP SLOPES IN CLAY
- 3A FINE-TO MEDIUM-GRAINED SAND BEACHES
- 3B SCARPS AND STEEP SLOPES IN SAND
- 5 MIXED SAND AND GRAVEL BEACHES
- 6A GRAVEL BEACHES
- 6B BEACH
- 7 EXPOSED TIDAL FLATS
- 8A SHELTERED ROCKY SHORES AND SHELTERED SCARPS IN MUD OR CLAY
- 8B SHELTERED, MAN-MADE STRUCTURES
- 9A SHELTERED TIDAL FLATS
- 9B SHELTERED, VEGETATED LOW BANKS
- 10A SALT AND BRACKISH-WATER MARSHES
- 10C FRESHWATER SWAMPS

COASTAL HABITATS
Based on 1988 Digital Shoreline

- 10A BRACKISH MARSH
- 10B INTERMEDIATE MARSH
- 10C FRESHWATER MARSH
- 10D SCRUB-SHRUB WETLAND
- SEAGRASS



SCALE 1:50,000

0 5 10 KILOMETER
0 5 10 MILE

Not For Navigation

December 2003
Published at Seattle, Washington
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Hazardous Materials Response Division

LAKE POINT

Louisiana ESI: ESIMAP 22
BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting
518	Shorebirds																
560	Lesser scaup	13 IND/SQ MI	X	X	X												
561	Lesser scaup	113 IND/SQ MI	X	X	X												
645	American coot	33 TO 165 IND/SQ MI	X	X	X												
	American wigeon	3 TO 73 IND/SQ MI	X	X	X												
	Blue-winged teal	9 TO 34 IND/SQ MI	X	X	X	X											
	Canvasback	UP TO 6 IND/SQ MI	X	X	X												
	Gadwall	36 TO 240 IND/SQ MI	X	X	X	X											
	Green-winged teal	9 TO 144 IND/SQ MI	X	X	X	X											
	Hooded merganser	PRESENT	X	X	X												
	Lesser scaup	2 TO 35 IND/SQ MI	X	X	X												
	Mallard	4 TO 66 IND/SQ MI	X	X	X												
	Mottled duck	8 TO 15 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP		
	Northern pintail	UP TO 39 IND/SQ MI	X	X	X												
	Northern shoveler	4 TO 34 IND/SQ MI	X	X	X												
	Ring-necked duck	2 TO 36 IND/SQ MI	X	X	X												
646	American coot	4 TO 42 IND/SQ MI	X	X	X												
	American wigeon	5 TO 39 IND/SQ MI	X	X	X	X											
	Blue-winged teal	9 TO 21 IND/SQ MI	X	X	X	X											
	Canvasback	UP TO 8 IND/SQ MI	X	X	X												
	Gadwall	46 TO 167 IND/SQ MI	X	X	X	X											
	Green-winged teal	23 TO 70 IND/SQ MI	X	X	X	X											
	Hooded merganser	UP TO 1 IND/SQ MI	X	X	X												
	Lesser scaup	2 TO 10 IND/SQ MI	X	X	X												
	Mallard	3 TO 19 IND/SQ MI	X	X	X												
	Mottled duck	7 TO 17 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP		
	Northern pintail	1 TO 56 IND/SQ MI	X	X	X												
	Northern shoveler	6 TO 31 IND/SQ MI	X	X	X	X											
	Ring-necked duck	UP TO 14 IND/SQ MI	X	X	X												

FISH:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Atlantic croaker	5	5	5	5	5	5	5	5	5	5	5	5	5	MAR-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-MAY	JAN-MAY	JAN-MAY	JAN-MAY	-
	Crevalle jack	3	2	3	3	3	3	3	3	3	3	2	-	-	-	-	-	JAN-DEC	-
	Florida pompano	3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-AUG	MAY-AUG	MAY-AUG	JAN-DEC	-
	Gizzard shad	4	3	3	4	4	4	4	4	4	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper	3	2	2	2	2	3	3	3	3	3	2	-	-	-	-	-	JAN-DEC	-
	Gulf menhaden	5	5	5	5	5	5	5	5	5	5	5	5	5	-	AUG-APR	AUG-APR	JAN-DEC	-
	Red drum	4	3	3	3	3	4	4	4	4	3	3	3	3	AUG-MAR	AUG-MAR	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	4	4	4	4	4	4	3	3	3	FEB-OCT	FEB-OCT	FEB-OCT	JAN-DEC	-
	Sheepshead	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	JAN-JUL	JAN-DEC	-
	Silver perch	4	3	3	3	4	3	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Southern flounder	4	3	3	3	4	4	4	4	4	4	4	3	-	-	-	SEP-APR	JAN-DEC	-
	Spanish mackerel	3	2	2	3	3	3	3	3	3	3	2	-	-	-	-	-	JAN-DEC	-
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	OCT-APR	OCT-APR	OCT-APR	JAN-DEC	-
	Spotted seatrout	4	3	3	3	4	4	4	4	4	4	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet	4	4	4	4	4	4	4	4	4	4	4	4	4	-	NOV-FEB	OCT-MAY	JAN-DEC	-
	Tarpon	3	2	2	2	3	3	3	3	3	2	-	-	-	-	-	MAY-NOV	JAN-DEC	-
584	Atlantic croaker	5	5	5	5	5	5	5	5	5	5	5	5	5	MAR-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-
	Crevalle jack	3	2	3	3	3	3	3	3	3	3	2	-	-	-	-	-	JAN-DEC	-
	Gizzard shad	4	3	3	4	4	4	4	4	4	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gulf menhaden	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Red drum	3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	4	4	4	4	4	4	3	3	3	-	-	-	JAN-DEC	-
	Sheepshead	4	3	3	4	4	4	4	4	4	4	3	-	-	-	-	-	JAN-DEC	-
	Silver perch	3	3	3	3	4	3	3	3	3	3	3	3	3	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-
	Southern flounder	4	3	3	3	4	4	4	4	4	4	3	-	-	-	-	-	JAN-DEC	-
	Spanish mackerel	3	2	2	2	3	3	3	3	3	3	2	-	-	-	-	-	JAN-DEC	-
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Spotted seatrout	3	3	3	3	4	3	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-

INVERTEBRATE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Bay squid	4	4	4	4	4	4	4	4	4	4	4	4	4	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Blue crab	5	4	5	5	5	5	5	5	5	5	5	5	5	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	4	5	5	5	5	5	5	5	4	4	3	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3	3	3	3	3	3	3	3	3	3	3	3	3	-	MAR-NOV	MAR-DEC	JAN-DEC	-
	Pink shrimp	5	3	3	5	5	3	3	3	3	3	3	3	3	-	-	APR-OCT	JAN-DEC	-
	White shrimp	5	3	3	5	5	5	5	5	5	5	5	5	5	APR-NOV	APR-NOV	MAR-DEC	JAN-DEC	-
584	Bay squid	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab	5	4	5	5	5	5	5	5	5	5	5	5	5	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	4	5	5	5	5	5	5	5	4	4	3	3	-	-	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	APR-SEP	JAN-DEC	-
	White shrimp	5	3	3	4	5	5	5	5	5	5	5	5	5	-	-	APR-DEC	JAN-DEC	-

REPTILE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Interbreeding	Juveniles	Adults
640	American alligator	593 TO 38 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
641	American alligator	2257 TO 68 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC

TERRESTRIAL MAMMAL:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
636	Common raccoon	77 TO 73 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink	329 TO 220 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat	99 TO 6 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter	1256 TO 423 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria	6 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
637	Common raccoon	68 TO 43 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink	466 TO 215 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat	9 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Louisiana ESI: ESIMAP 22 (cont.)

BIOLOGICAL RESOURCES: (cont.)

TERRESTRIAL MAMMAL:

RAR#	Species	S F Conc.	J F M A M J J A S O N D
637	Northern river otter	752 TO 373 AC/NEST	X X X X X X X X X X X X
	Nutria	7 TO 5 AC/NEST	X X X X X X X X X X X X

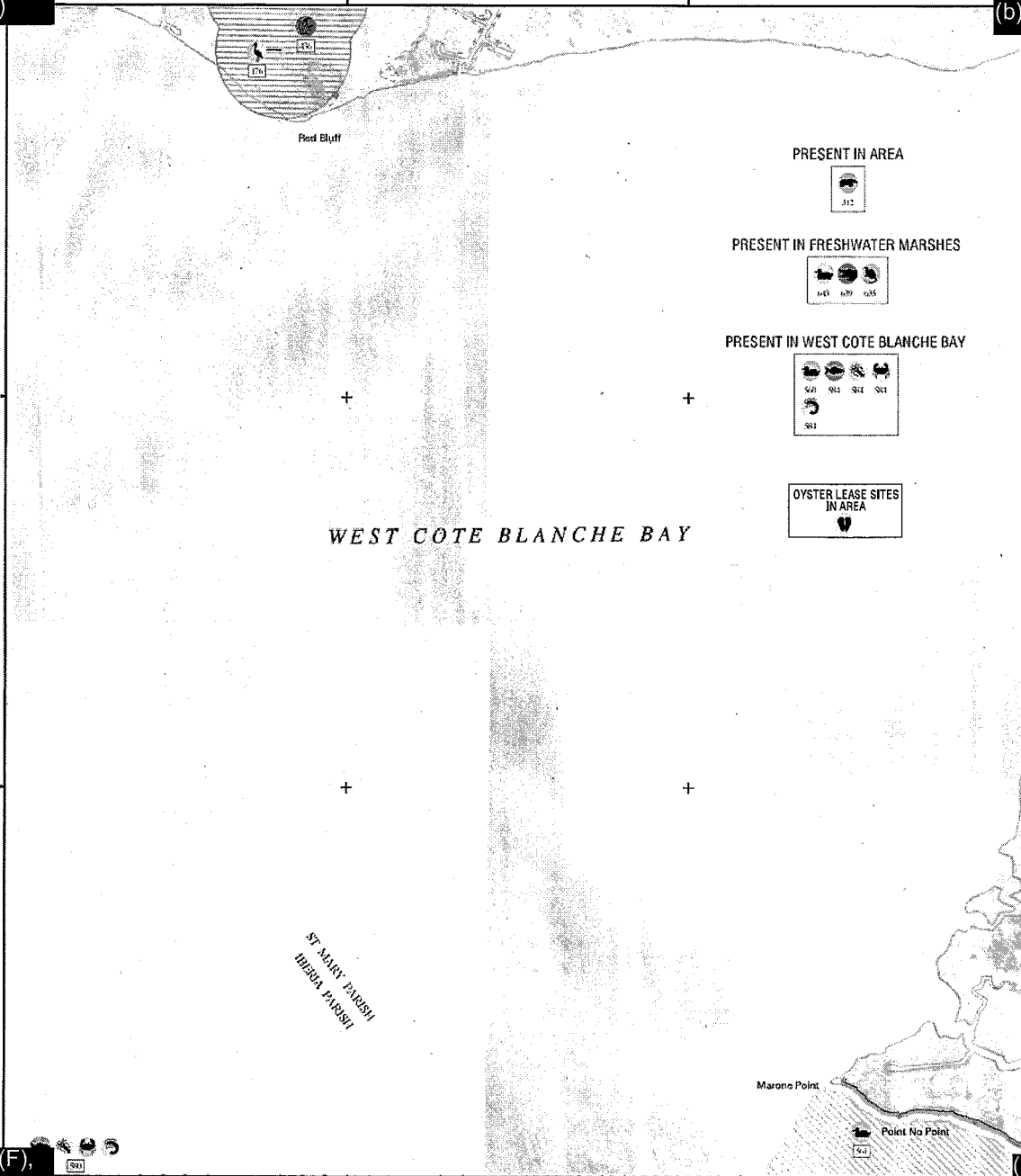
HUMAN USE RESOURCES:

WILDLIFE REFUGE:

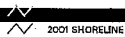
HUN#	Name	Owner	Contact	Phone
121	MARSH ISLAND WMA		LDWF	

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)

SHORELINE



NOTE FOR COASTAL MAPS:

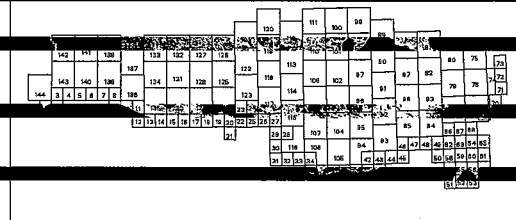
Due to the dynamic nature of the Louisiana coastline, biological resources may represent historical locations that do not correspond with the depicted shoreline.

SHORELINE HABITATS (ESI)
2001 ESI Shoreline Classification

- 10 EXPOSED, SOLID MAN-MADE STRUCTURES
- 2A EXPOSED WAVE-CUT PLATFORMS IN CLAY
- 2B EXPOSED SCARPS AND STEEP SLOPES IN CLAY
- 3A FINE-TO MEDIUM-GRAINED SAND BEACHES
- 3B SCARPS AND STEEP SLOPES IN SAND
- 5 MIXED SAND AND GRAVEL BEACHES
- 6A GRAVEL BEACHES
- 6B BEACH
- 7 EXPOSED TIDAL FLATS
- 8A SHELTERED ROCKY SHORES AND SHELTERED SCARPS IN MUD OR CLAY
- 8B SHELTERED, MAN-MADE STRUCTURES
- 9A SHELTERED TIDAL FLATS
- 9B SHELTERED, VEGETATED LOW BANKS
- 10A SALTS AND BRACKISH-WATER MARSHES
- 10C FRESHWATER SWAMPS

COASTAL HABITATS
Based on 1988 Digital Shoreline

- 10A SALTY MARCH
- 10A BRACKISH MARSH
- 10A INTERMEDIATE MARSH
- 10B FRESHWATER MARSH
- 10C SCRUB-SHRUB WETLAND
- SEAGRASS



SCALE 1:50,000



Not For Navigation

MARONE POINT

December 2003

Published at Seattle, Washington
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Hazardous Materials Response Division

Louisiana ESI: ESIMAP 23

BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting
176	Cattle egret	4 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	APR-AUG	-	-
	Great egret	13 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-
	Little blue heron	24 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-
	Snowy egret	24 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-
	Tricolored heron	2 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-
560	Lesser scaup	13 IND/SQ MI	X	X	X											-	-
561	Lesser scaup	113 IND/SQ MI	X	X	X											-	-
643	American coot	2 TO 215 IND/SQ MI	X	X	X											-	-
	American wigeon	1 TO 116 IND/SQ MI	X	X	X	X										-	-
	Blue-winged teal	2 TO 30 IND/SQ MI	X	X	X	X	X									-	-
	Canvasback	UP TO 21 IND/SQ MI	X	X	X											-	-
	Gadwall	10 TO 243 IND/SQ MI	X	X	X	X										-	-
	Green-winged teal	6 TO 86 IND/SQ MI	X	X	X	X										-	-
	Hooded merganser	PRESENT	X	X	X											-	-
	Lesser scaup	UP TO 41 IND/SQ MI	X	X	X											-	-
	Mallard	20 TO 99 IND/SQ MI	X	X	X											-	-
	Mottled duck	3 TO 18 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	2 TO 70 IND/SQ MI	X	X	X											-	-
	Northern shoveler	UP TO 24 IND/SQ MI	X	X	X	X										-	-
	Ring-necked duck	UP TO 56 IND/SQ MI	X	X	X											-	-

FISH:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Atlantic croaker	5	5	5	5	5	5	5	4	4	4	5	5	5	MAR-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-MAY	JAN-MAY	JAN-MAY	JAN-DEC	-
	Crevalle jack	3	2	3	3	3	3	3	3	3	3	2			-	-	-	JAN-DEC	-
	Florida pompano	3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-AUG	MAY-AUG	MAY-AUG	JAN-DEC	-
	Gizzard shad	4	3	3	3	4	4	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper	3	2	2	2	2	3	3	3	3	3	2			-	-	-	JAN-DEC	-
	Gulf menhaden	5	5	5	5	5	5	5	5	5	5	5	5	5	-	AUG-APR	AUG-APR	JAN-DEC	-
	Red drum	4	3	3	3	3	4	4	4	4	3	3	3	3	AUG-MAR	AUG-MAR	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	4	4	4	4	4	4	3	3	3	FEB-OCT	FEB-OCT	FEB-OCT	JAN-DEC	-
	Sheepshead	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	JAN-JUL	JAN-DEC	-
	Silver perch	4	3	3	3	4	3	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Southern flounder	4	3	3	3	4	4	4	4	4	4	4	3	3	-	-	SEP-APR	JAN-DEC	-
	Spanish mackerel	3	2	2	3	3	3	3	3	3	3	2			-	-	-	JAN-DEC	-
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	OCT-APR	OCT-APR	OCT-APR	JAN-DEC	-
	Spotted seatrout	4	3	3	3	4	4	4	4	4	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet	4	4	4	4	4	4	4	4	4	4	4	4	4	-	NOV-FEB	OCT-MAY	JAN-DEC	-
	Tarpon	3	2	2	2	2	3	3	3	3	3	2			-	-	MAY-NOV	JAN-DEC	-
584	Atlantic croaker	5	5	5	5	5	5	5	4	4	4	5	5	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	-	JAN-DEC	-
	Crevalle jack	3	2	3	3	3	3	3	3	3	3	2			-	-	-	JAN-DEC	-
	Gizzard shad	4	3	3	3	4	4	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gulf menhaden	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Red drum	3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	4	4	4	4	4	4	3	3	3	-	-	-	JAN-DEC	-
	Sheepshead	4	3	3	3	4	4	4	4	4	4	3	3	3	-	-	-	JAN-DEC	-
	Silver perch	3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-
	Southern flounder	4	3	3	3	4	4	4	4	4	4	3	3	3	-	-	-	JAN-DEC	-
	Spanish mackerel	3	2	2	2	2	3	3	3	3	3	2			-	-	-	JAN-DEC	-
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Spotted seatrout	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-

HABITAT:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
436	Rare plant		X	X	X	X	X	X	X	X	X	X	X	X

INVERTEBRATE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Bay squid	4	4	4	4	4	4	4	4	4	4	4	4	4	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Blue crab	5	4	4	5	5	5	5	5	5	5	5	4	4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	4	5	5	5	5	5	5	5	5	4	4	3	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3	3	3	3	3	3	3	3	3	3	3	3	3	-	MAR-NOV	MAR-DEC	JAN-DEC	-
	Pink shrimp	5	3	3	5	5	3	3	3	3	3	3	3	3	-	-	APR-OCT	JAN-DEC	-
	White shrimp	5	3	3	5	5	5	5	5	5	5	5	4	4	APR-NOV	APR-NOV	MAR-DEC	JAN-DEC	-
584	Bay squid	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab	5	4	4	5	5	5	5	5	5	5	5	4	4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	4	4	5	5	5	5	5	5	5	4	4	3	-	-	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	APR-SEP	JAN-DEC	-
	White shrimp	5	3	3	4	5	5	5	5	5	5	5	4	4	-	-	APR-DEC	JAN-DEC	-

REPTILE:

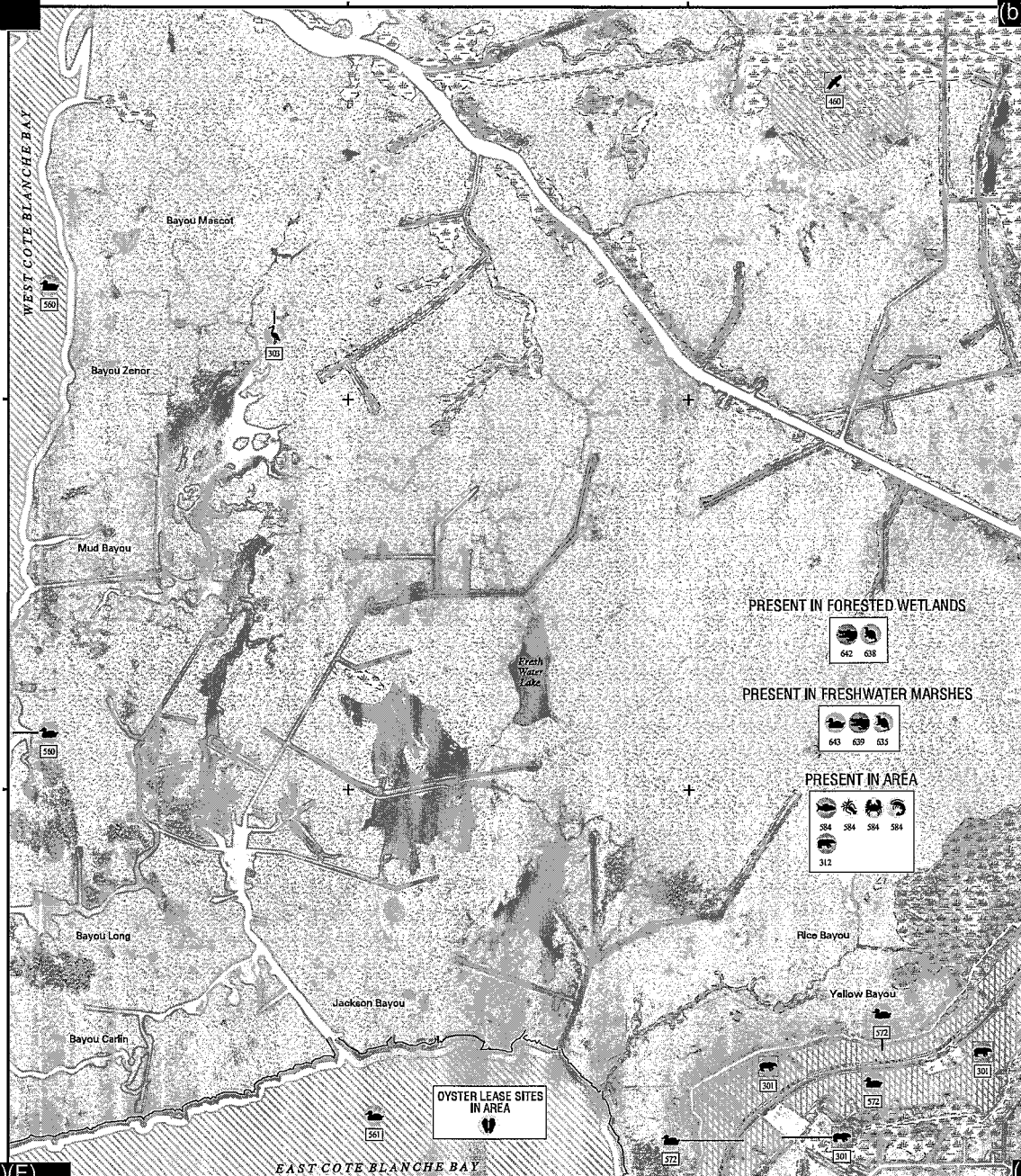
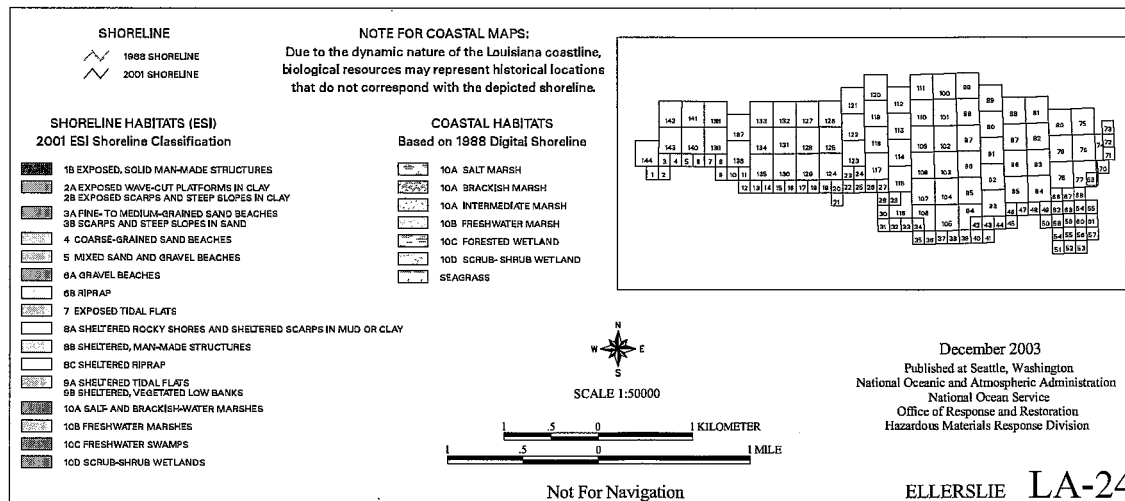
RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Internesting	Juveniles	Adults
639	American alligator	661 TO 9 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC

TERRESTRIAL MAMMAL:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
312	Louisiana black bear	T OCCUPIED	X	X	X	X	X	X	X	X	X	X	X	X
635	Common raccoon	86 TO 42 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink	223 TO 179 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat	36 TO 17 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter	2036 TO 828 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria	3 TO 2 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)

Louisiana ESI: ESIMAP 24

BIOLOGICAL RESOURCES:

BIRD:																					
RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting		
303	Cattle egret	70	IND	(90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	APR-AUG	-	-		
	Little blue heron	70	IND	(90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-		
	Snowy egret	70	IND	(90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-		
	Tricolored heron	40	IND	(90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-		
460	Threatened raptor	T			X	X	X	X	X	X	X	X	X	X	X	X	OCT-MAY	-	-		
560	Lesser scaup	13	IND/SQ MI		X	X	X											-	-		
561	Lesser scaup	113	IND/SQ MI		X	X	X											-	-		
572	American coot	2	IND/SQ MI		X	X	X											-	-		
	American wigeon	2	IND/SQ MI		X	X	X											-	-		
	Blue-winged teal	16	IND/SQ MI		X	X	X	X										-	-		
	Canvasback	PRESENT			X	X	X											-	-		
	Gadwall	7	IND/SQ MI		X	X	X	X										-	-		
	Green-winged teal	23	IND/SQ MI		X	X	X	X										-	-		
	Hooded merganser	PRESENT			X	X	X											-	-		
	Lesser scaup	PRESENT			X	X	X											-	-		
	Mallard	19	IND/SQ MI		X	X	X											-	-		
	Mottled duck	4	IND/SQ MI		X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-		
	Northern pintail	45	IND/SQ MI		X	X	X											-	-		
	Northern shoveler	12	IND/SQ MI		X	X	X	X										-	-		
	Ring-necked duck	1	IND/SQ MI		X	X	X											-	-		
643	American coot	2	TO 215	IND/SQ MI	X	X	X											-	-		
	American wigeon	1	TO 116	IND/SQ MI	X	X	X	X										-	-		
	Blue-winged teal	2	TO 30	IND/SQ MI	X	X	X	X	X									-	-		
	Canvasback	UP	TO 21	IND/SQ MI	X	X	X											-	-		
	Gadwall	10	TO 243	IND/SQ MI	X	X	X	X										-	-		
	Green-winged teal	6	TO 86	IND/SQ MI	X	X	X	X										-	-		
	Hooded merganser	PRESENT			X	X	X											-	-		
	Lesser scaup	UP	TO 41	IND/SQ MI	X	X	X											-	-		
	Mallard	20	TO 99	IND/SQ MI	X	X	X											-	-		
	Mottled duck	3	TO 18	IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-		
	Northern pintail	2	TO 70	IND/SQ MI	X	X	X											-	-		
	Northern shoveler	UP	TO 24	IND/SQ MI	X	X	X	X										-	-		
	Ring-necked duck	UP	TO 56	IND/SQ MI	X	X	X											-	-		
FISH:																					
RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
584	Atlantic croaker	5			5	5	5	5	5	5	5	5	5	5	5	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5			5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3			3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-
	Crevalle jack	3			2	2	3	3	3	3	3	3	3	3	3	2	-	-	-	JAN-DEC	-
	Gizzard shad	4			3	3	3	4	4	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper	2			2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gulf menhaden	5			5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Red drum	3			3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-
	Sand seatrout	4			3	3	3	3	4	4	4	4	4	4	3	3	-	-	-	JAN-DEC	-
	Sheepshead	4			3	3	3	4	4	4	4	4	4	4	4	3	-	-	-	JAN-DEC	-
	Silver perch	3			3	3	3	3	3	3	3	3	3	3	3	3	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-
	Southern flounder	4			3	3	3	4	4	4	4	4	4	4	4	3	-	-	-	JAN-DEC	-
	Spanish mackerel	3			2	2	2	2	3	3	3	3	3	3	2	2	-	-	-	JAN-DEC	-
	Spot	5			5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Spotted seatrout	3			3	3	3	3	3	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet	4			4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Tarpon	2			2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
INVERTEBRATE:																					
RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
584	Bay squid	3			3	3	3	3	3	3	3	3	3	3	3	3	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab	5			4	4	5	5	5	5	5	5	5	5	5	4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5			3	4	5	5	5	5	5	5	5	4	4	3	-	-	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3			3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	3			3	3	3	3	3	3	3	3	3	3	3	3	-	-	APR-SEP	JAN-DEC	-
	White shrimp	5			3	3	4	5	5	5	5	5	5	5	5	4	-	-	APR-DEC	JAN-DEC	-
REPTILE:																					
RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Internesting	Juveniles	Adults
639	American alligator	661	TO 9	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
642	American alligator	1000	TO 250	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
TERRESTRIAL MAMMAL:																					
RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Internesting	Juveniles	Adults
301	Louisiana black bear	T	TRANSIENT		X	X	X	X	X	X	X	X	X	X	X	X					
312	Louisiana black bear	T	OCCUPIED		X	X	X	X	X	X	X	X	X	X	X	X					
635	Common raccoon	86	TO 42	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Mink	223	TO 179	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Muskrat	36	TO 17	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Northern river otter	2036	TO 828	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Nutria	3	TO 2	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
638	Common raccoon	25	TO 23	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Mink	96	TO 56	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Muskrat	196	TO 53	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Northern river otter	877	TO 728	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					
	Nutria	15	TO 3	AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X					

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)(F),
(b) (3)(b) (7)
(F), (b)

PRESENT IN EAST COTE BLANCHE BAY



PRESENT IN FRESHWATER MARSHES



PRESENT IN AREA



EAST COTE BLANCHE BAY

OYSTER LEASE SITES
IN AREA

+

+

Salt Point

Bayou Sale Bay

Tucky Hammock

Point Chevreuil

ATCHAFALAYA
RAYATCHAFALAYA DELTA
WILDLIFE MANAGEMENT AREA

GULF OF MEXICO

ST. ARMY DAM
RIVER PARISH(b) (7)(F),
(b) (3)(b) (7)
(F), (b)

SHORELINE



NOTE FOR COASTAL MAPS:

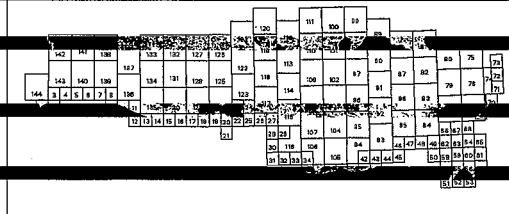
Due to the dynamic nature of the Louisiana coastline, biological resources may represent historical locations that do not correspond with the depicted shoreline.

SHORELINE HABITATS (ESI)
2001 ESI Shoreline Classification

- 19 EXPOSED, SOFT-MAN-MADE STRUCTURES
- 2A EXPOSED WAVE-CUT PLATFORMS IN CLAY
- 2B EXPOSED SCARPS AND STEEP SLOPES IN CLAY
- 3A FINE- TO MEDIUM-GRAINED SAND BEACHES
- 3B SCARPS AND STEEP SLOPES IN SAND
- 5 MIXED SAND AND GRAVEL BEACHES
- 6A GRAVEL BEACHES
- 6B BEACH
- 7 EXPOSED TIDAL FLATS
- 8A SHELTERED ROCKY SHORES AND SHELTERED SCARPS IN MUD OR CLAY
- 8B SHELTERED, MAN-MADE STRUCTURES
- 8A SHELTERED TIDAL FLATS
- 8B SHELTERED, VEGETATED LOW BANKS
- 10A SALT- AND BRACKISH-WATER MARSHES
- 10C FRESHWATER SWAMPS

COASTAL HABITATS
Based on 1988 Digital Shoreline

- 10A FINE-MAN-MADE
- 10A BRACKISH MARSH
- 10A INTERMEDIATE MARSH
- 10B FRESHWATER MARSH
- 10C SCRUB-SHRUB WETLAND
- SEAGRASS



SCALE: 1:50,000

1 5 0 1 KILOMETER

Not For Navigation

POINT CHEVREUIL

December 2003

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National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Hazardous Materials Response Division

Louisiana ESI: ESIMAP 25

BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting
460	Threatened raptor	T	X	X	X	X	X	X	X	X	X	X	X	X	OCT-MAY	-	-
561	Lesser scaup	113 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
572	American coot	2 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	American wigeon	2 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Blue-winged teal	16 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Canvasback	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Gadwall	7 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Green-winged teal	23 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Hooded merganser	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Lesser scaup	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Mallard	19 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Mottled duck	4 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	45 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Northern shoveler	12 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Ring-necked duck	1 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
643	American coot	2 TO 215 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	American wigeon	1 TO 116 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Blue-winged teal	2 TO 30 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Canvasback	UP TO 21 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Gadwall	10 TO 243 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Green-winged teal	6 TO 86 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Hooded merganser	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Lesser scaup	UP TO 41 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Mallard	20 TO 99 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Mottled duck	3 TO 18 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	2 TO 70 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Northern shoveler	UP TO 24 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
	Ring-necked duck	UP TO 56 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-

FISH:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
410	Alligator gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bantam sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bighead carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bigmouth buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black crappie	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bluegill	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bowfin	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Catfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Chubsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Common carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Freshwater drum	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gizzard shad	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Grass carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf menhaden	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Hybrid sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Largemouth bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Logperch	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Longear sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Minnows	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Orangespotted sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Paddlefish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Redear sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	River carpsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shiners	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shortnose gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shovelnose sturgeon	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Silver carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Smallmouth buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped mullet	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Threadfin shad	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White crappie	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Yellow bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
584	Atlantic croaker	5	5	5	5	5	5	5	5	5	5	5	5	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	3	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-
	Crevalle jack	3	2	2	3	3	3	3	3	3	3	2	-	-	-	-	JAN-DEC	JAN-DEC	-
	Gizzard shad	4	3	3	3	4	4	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gulf menhaden	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Red drum	3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	3	4	4	4	4	4	4	3	3	-	-	-	JAN-DEC	-
	Sheepshead	4	3	3	3	4	4	4	4	4	4	4	3	3	-	-	-	JAN-DEC	-
	Silver perch	3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-
	Southern flounder	4	3	3	3	4	4	4	4	4	4	4	3	3	-	-	-	JAN-DEC	-
	Spanish mackerel	3	2	2	2	2	3	3	3	3	3	3	2	2	-	-	-	JAN-DEC	-
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Spotted seatrout	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
630	Atlantic croaker	5	5	5	5	5	5	5	5	5	5	5	5	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-
	Crevalle jack	3	2	2	3	3	3	3	3	3	3	3	2	2	-	-	-	JAN-DEC	-
	Gray snapper	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Red drum	3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	3	4	4	4	4	4	4	3	3	-	-	-	JAN-DEC	-
	Sheepshead	4	3	3	3	4	4	4	4	4	4	4	3	3	-	-	-	JAN-DEC	-
	Silver perch	3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-
	Southern flounder	4	3	3	3	4	4	4	4	4	4	4	3	3	-	-	-	JAN-DEC	-
	Spanish mackerel	3	2	2	2	2	3	3	3	3	3	3	2	2	-	-	-	JAN-DEC	-
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Spotted seatrout	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Louisiana ESI: ESIMAP 25 (cont.)

BIOLOGICAL RESOURCES: (cont.)

INVERTEBRATE:

RAR#	Species	S F Conc.	J F M A M J J A S O N D	Spawning	Eggs	Larvae	Juveniles	Adults
411	River shrimp	PRESENT	X X X X X X X X X X X X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White river crawfish	PRESENT	X X X X X X X X X X X X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
584	Bay squid	3	3 3 3 3 3 3 3 3 3 3 3 3	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab	5	4 4 5 5 5 5 5 5 5 5 4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	3 4 5 5 5 5 5 5 5 4 4 3	-	-	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3	3 3 3 3 3 3 3 3 3 3 3 3	-	-	-	JAN-DEC	-
	Pink shrimp	3	3 3 3 3 3 3 3 3 3 3 3 3	-	-	APR-SEP	JAN-DEC	-
	White shrimp	5	3 3 4 5 5 5 5 5 5 5 4	-	-	APR-DEC	JAN-DEC	-
630	Bay squid	3	3 3 3 3 3 3 3 3 3 3 3 3	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab	5	4 4 5 5 5 5 5 5 5 5 4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	3 4 5 5 5 5 5 5 5 4 4 3	-	-	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3	3 3 3 3 3 3 3 3 3 3 3 3	-	-	-	JAN-DEC	-
	Pink shrimp	3	3 3 3 3 3 3 3 3 3 3 3 3	-	-	APR-SEP	JAN-DEC	-
	White shrimp	5	3 3 4 5 5 5 5 5 5 5 4	-	-	APR-DEC	JAN-DEC	-

REPTILE:

RAR#	Species	S F Conc.	J F M A M J J A S O N D	Nesting	Hatching	Interbreeding	Juveniles	Adults
639	American alligator	661 TO 9 AC/NEST	X X X X X X X X X X X X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
642	American alligator	1000 TO 250 AC/NEST	X X X X X X X X X X X X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC

TERRESTRIAL MAMMAL:

RAR#	Species	S F Conc.	J F M A M J J A S O N D
301	Louisiana black bear	T TRANSIENT	X X X X X X X X X X X X
312	Louisiana black bear	T OCCUPIED	X X X X X X X X X X X X
635	Common raccoon	86 TO 42 AC/NEST	X X X X X X X X X X X X
	Mink	223 TO 179 AC/NEST	X X X X X X X X X X X X
	Muskrat	36 TO 17 AC/NEST	X X X X X X X X X X X X
	Northern river otter	2036 TO 828 AC/NEST	X X X X X X X X X X X X
	Nutria	3 TO 2 AC/NEST	X X X X X X X X X X X X
638	Common raccoon	25 TO 23 AC/NEST	X X X X X X X X X X X X
	Mink	96 TO 56 AC/NEST	X X X X X X X X X X X X
	Muskrat	196 TO 53 AC/NEST	X X X X X X X X X X X X
	Northern river otter	877 TO 728 AC/NEST	X X X X X X X X X X X X
	Nutria	15 TO 3 AC/NEST	X X X X X X X X X X X X

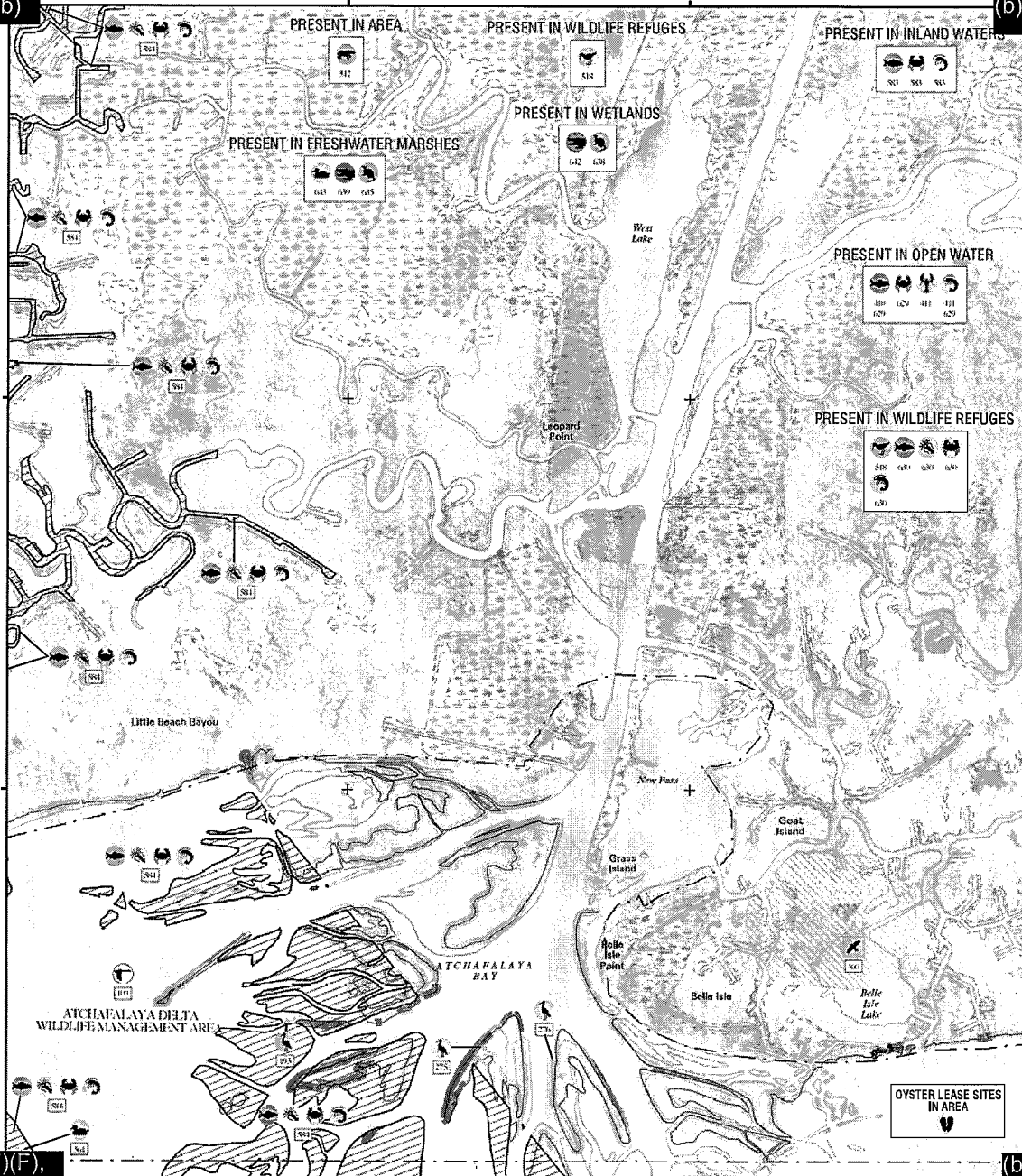
HUMAN USE RESOURCES:

WILDLIFE REFUGE:

HUN#	Name	Owner	Contact	Phone
100	ATCHAPALAYA DELTA WMA		LOWE	

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)
(F), (b)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)

SHORELINE



NOTE FOR COASTAL MAPS:

Due to the dynamic nature of the Louisiana coastline, biological resources may represent historical locations that do not correspond with the depicted shoreline.

SHORELINE HABITATS (ESI)
2001 ESI Shoreline Classification

- 1A EXPOSED, SOFT, MAN-MADE STRUCTURES
- 2A EXPOSED WAVE-CUT PLATFORMS IN CLAY
- 2B EXPOSED SCARPS AND STEEP SLOPES IN CLAY
- 3A FINE-TO MEDIUM-GRAINED SAND BEACHES
- 3B SCARPS AND STEEP SLOPES IN SAND

- 5 MIXED SAND AND GRAVEL BEACHES
- 6A GRAVEL BEACHES
- 6B BEACHES

- 7 EXPOSED TIDAL FLATS

- 8A SHELTERED ROCKY SHORES AND SHELTERED SCARPS IN MUD OR CLAY
- 8B SHELTERED, MAN-MADE STRUCTURES

- 9A SHELTERED TIDAL FLATS
- 9B SHELTERED, VEGETATED LOW BANKS

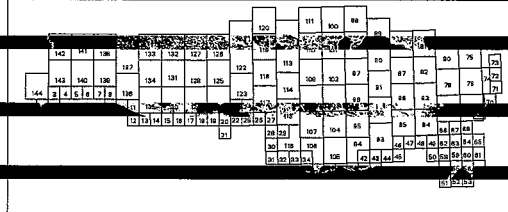
- 10A SALT- AND BRACKISHWATER MARSHES

- 10C FRESHWATER SWAMPS

COASTAL HABITATS
Based on 1988 Digital Shoreline

- 10A SALT MARSH
- 10A BRACKISH MARSH
- 10A INTERMEDIATE MARSH
- 10B FRESHWATER MARSH

- 10D SCRUB-SHRUB WETLAND
- SEAGRASS



SCALE 1:50,000

5 0 1 KILOMETER

5 0 1 MILE

Not For Navigation

BELLE ISLE

December 2003

Published at Seattle, Washington
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Hazardous Materials Response Division

Louisiana ESI: ESIMAP 26

BIOLOGICAL RESOURCES:

BIRD:																			
RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting		
195	Cattle egret	5 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	APR-AUG	-	-		
	Tricolored heron	10 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-		
275	Black-crowned night-heron	1 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-AUG	-	-		
	Cattle egret	6 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	APR-AUG	-	-		
	Great egret	1 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-		
	Snowy egret	4 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-		
	Tricolored heron	9 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-		
	White-faced or Glossy ibis	1 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	APR-AUG	-	-		
276	Cattle egret	29 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	APR-AUG	-	-		
	Roseate spoonbill	1 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	APR-JUL	-	-		
	Snowy egret	14 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-		
	Tricolored heron	14 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-		
460	Threatened raptor	T	X	X	X	X	X	X	X	X	X	X	X	X	OCT-MAY	-	-		
518	Shorebirds		X	X	X	X	X	X	X	X	X	X	X	X	-	-	-		
561	Lesser scaup	113 IND/SQ MI	X	X	X							X	X	X	-	-	-		
643	American coot	2 TO 215 IND/SQ MI	X	X	X								X	X	-	-	-		
	American wigeon	1 TO 116 IND/SQ MI	X	X	X	X							X	X	-	-	-		
	Blue-winged teal	2 TO 30 IND/SQ MI	X	X	X	X	X					X	X	X	-	-	-		
	Canvasback	UP TO 21 IND/SQ MI	X	X	X								X	X	-	-	-		
	Gadwall	10 TO 243 IND/SQ MI	X	X	X	X							X	X	-	-	-		
	Green-winged teal	6 TO 86 IND/SQ MI	X	X	X	X						X	X	X	-	-	-		
	Hooded merganser	PRESENT	X	X	X								X	X	-	-	-		
	Lesser scaup	UP TO 41 IND/SQ MI	X	X	X								X	X	-	-	-		
	Mallard	20 TO 99 IND/SQ MI	X	X	X								X	X	-	-	-		
	Mottled duck	3 TO 18 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-		
	Northern pintail	2 TO 70 IND/SQ MI	X	X	X								X	X	X	-	-		
	Northern shoveler	UP TO 24 IND/SQ MI	X	X	X	X							X	X	X	-	-		
	Ring-necked duck	UP TO 56 IND/SQ MI	X	X	X								X	X	X	-	-		
FISH:																			
RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
410	Alligator gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bantam sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bighead carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bigmouth buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black crappie	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bluegill	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bowfin	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Catfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Chubsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Common carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Freshwater drum	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gizzard shad	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Grass carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf menhaden	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Hybrid sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Largemouth bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Logperch	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Longear sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Minnows	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Orangespotted sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Paddlefish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Redear sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	River carpsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shiners	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shortnose gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shovelnose sturgeon	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Silver carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Smallmouth buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped mullet	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Threadfin shad	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White crappie	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Yellow bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
583	Atlantic croaker	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Bay anchovy	4	4	4	4	4	4	4	4	4	4	4	4	4	-	APR-OCT	APR-OCT	JAN-DEC	-
	Black drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Crevalle jack	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gizzard shad	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gulf menhaden	5	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Red drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Sand seatrout	4	3	3	3	4	4	4	4	4	3	3	3	3	-	-	-	JAN-DEC	-
	Sheepshead	3	2	2	3	3	3	3	3	3	2	2	2	2	-	-	-	JAN-DEC	-
	Silver perch	3	2	2	3	3	3	3	3	3	2	2	2	2	-	-	-	JAN-DEC	-
	Southern flounder	3	2	2	3	3	3	3	3	3	2	2	2	2	-	-	-	JAN-DEC	-
	Spot	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Spotted seatrout	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Striped mullet	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
584	Atlantic croaker	5	5	5	5	5	5	4	4	4	5	5	5	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-
	Crevalle jack	3	2	2	3	3	3	3	3	3	3	2	2	2	-	-	-	JAN-DEC	-
	Gizzard shad	4	3	3	4	4	4	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gulf menhaden	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Red drum	3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	4	4												

Louisiana ESI: ESIMAP 26 (cont.)

BIOLOGICAL RESOURCES: (cont.)

FISH:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
629	Creville jack	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Red drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Sand seatrout	4	3	3	3	3	4	4	4	4	4	4	3	3	-	-	-	JAN-DEC	-
	Sheepshead	3	2	2	2	3	3	3	3	3	3	3	2	2	-	-	-	JAN-DEC	-
	Silver perch	3	2	2	3	3	3	3	3	3	3	3	2	2	-	-	-	JAN-DEC	-
	Southern flounder	3	2	2	3	3	3	3	3	3	3	3	2	2	-	-	-	JAN-DEC	-
	Spot	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Spotted seatrout	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
630	Atlantic croaker	5	5	5	5	5	5	5	4	4	4	5	5	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-
	Creville jack	3	2	2	3	3	3	3	3	3	3	3	2	2	-	-	-	JAN-DEC	-
	Gray snapper	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Red drum	3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	3	4	4	4	4	4	4	3	3	-	-	-	JAN-DEC	-
	Sheepshead	4	3	3	3	4	4	4	4	4	4	4	4	3	-	-	-	JAN-DEC	-
	Silver perch	3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-
	Southern flounder	4	3	3	3	3	4	4	4	4	4	4	4	3	-	-	-	JAN-DEC	-
	Spanish mackerel	3	2	2	2	2	3	3	3	3	3	3	2	2	-	-	-	JAN-DEC	-
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Spotted seatrout	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-

INVERTEBRATE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
411	River shrimp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White river crawfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
583	Blue crab	4	4	4	3	3	3	3	3	3	3	3	4	4	-	-	-	JAN-DEC	-
	Brown shrimp	5	3	3	4	5	5	4	4	4	4	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	White shrimp	4	3	3	3	3	3	4	4	4	3	3	3	3	-	-	-	JAN-DEC	-
584	Bay squid	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab	5	4	4	5	5	5	5	5	5	5	5	4	4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	3	4	5	5	5	5	5	5	5	4	4	3	-	-	-	JAN-DEC	-
	Gulf stone crab	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	APR-SEP	JAN-DEC	-
	White shrimp	5	3	3	4	5	5	5	5	5	5	5	4	4	-	-	APR-DEC	JAN-DEC	-
629	Blue crab	4	4	4	3	3	3	3	3	3	3	3	4	4	-	-	-	JAN-DEC	-
	Brown shrimp	5	3	3	4	5	5	4	4	4	3	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	White shrimp	4	3	3	3	3	4	4	4	3	3	3	3	3	-	-	-	JAN-DEC	-
630	Bay squid	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab	5	4	4	5	5	5	5	5	5	5	5	4	4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	3	4	5	5	5	5	5	5	4	4	3	3	-	-	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	APR-SEP	JAN-DEC	-
	White shrimp	5	3	3	4	5	5	5	5	5	5	5	4	4	-	-	APR-DEC	JAN-DEC	-

REPTILE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Interbreeding	Juveniles	Adults
639	American alligator	661 TO 9 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
642	American alligator	1000 TO 250 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC

TERRESTRIAL MAMMAL:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
312	Louisiana black bear	T OCCUPIED	X	X	X	X	X	X	X	X	X	X	X	X
635	Common raccoon	86 TO 42 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink	223 TO 179 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat	36 TO 17 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter	2036 TO 828 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria	3 TO 2 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
638	Common raccoon	25 TO 23 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink	96 TO 56 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat	196 TO 53 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter	877 TO 728 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria	15 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X

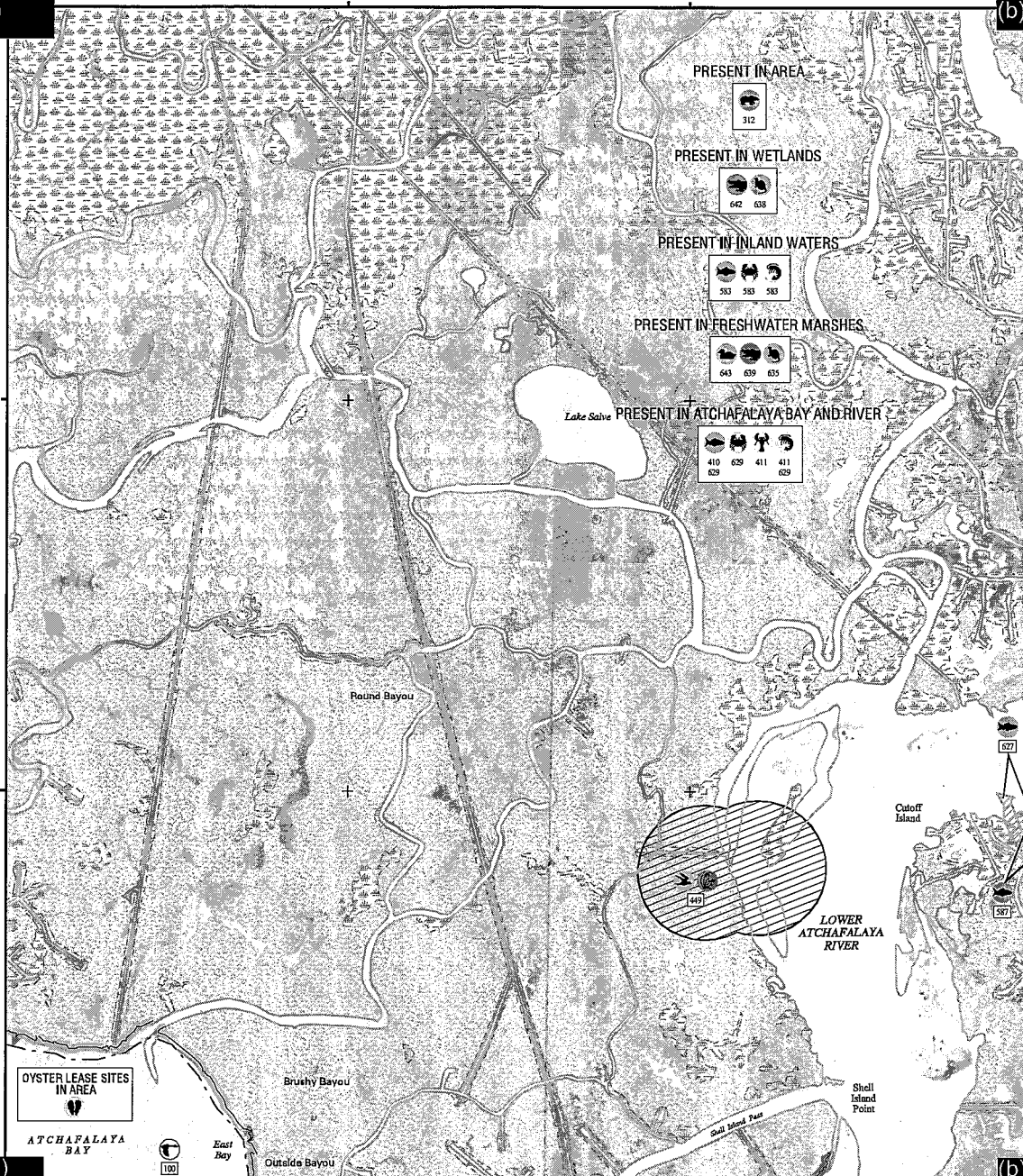
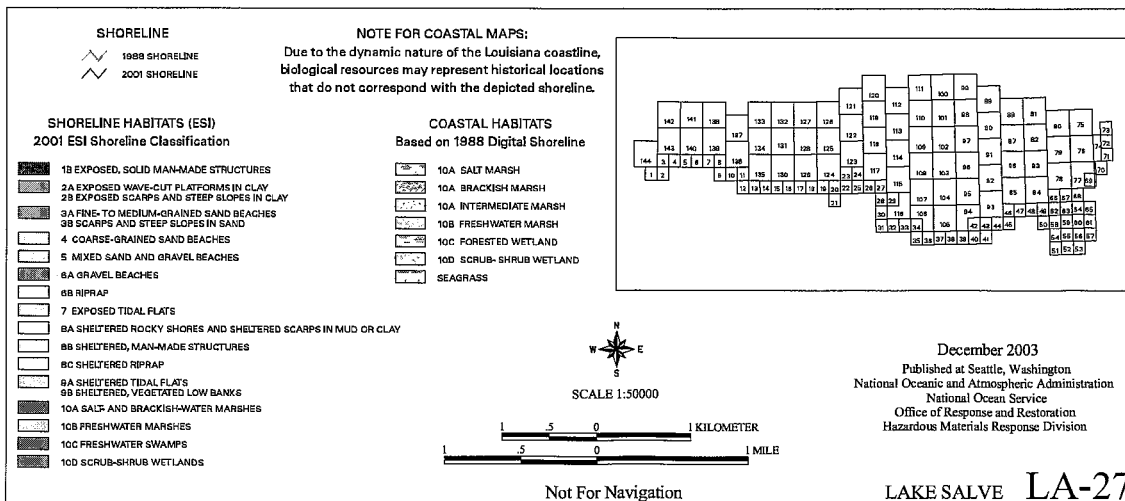
HUMAN USE RESOURCES:

WILDLIFE REFUGE:

HUN#	Name	Owner	Contact	Phone
100	ATCHAFALAYA DELTA WMA		LDWF	

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)
(F), (b)
(3)(b) (7)(F),
(b) (3)

Louisiana ESI: ESIMAP 27

BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting
449	Colonial waterbirds		X	X	X	X	X	X	X	X	X	X	X	X	NOV-SEP	-	-
643	American coot	2 TO 215 IND/SQ MI	X	X	X										X	X	-
	American wigeon	1 TO 116 IND/SQ MI	X	X	X	X									X	X	-
	Blue-winged teal	2 TO 30 IND/SQ MI	X	X	X	X									X	X	-
	Canvasback	UP TO 21 IND/SQ MI	X	X	X										X	X	-
	Gadwall	10 TO 243 IND/SQ MI	X	X	X	X									X	X	-
	Green-winged teal	6 TO 86 IND/SQ MI	X	X	X	X									X	X	-
	Hooded merganser	PRESENT	X	X	X										X	X	-
	Lesser scaup	UP TO 41 IND/SQ MI	X	X	X										X	X	-
	Mallard	20 TO 99 IND/SQ MI	X	X	X										X	X	-
	Mottled duck	3 TO 18 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	2 TO 70 IND/SQ MI	X	X	X										X	X	-
	Northern shoveler	UP TO 24 IND/SQ MI	X	X	X	X									X	X	-
	Ring-necked duck	UP TO 56 IND/SQ MI	X	X	X										X	X	-

FISH:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
410	Alligator gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bantam sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bighead carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bigmouth buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black crappie	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bluegill	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bowfin	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Catfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Chubsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Common carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Freshwater drum	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gizzard shad	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Grass carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf menhaden	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Hybrid sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Largemouth bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Logperch	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Longear sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Minnows	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Orangespotted sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Paddlefish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Redear sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	River carpsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shiners	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shortnose gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shovelnose sturgeon	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Silver carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Smallmouth buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped mullet	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Threadfin shad	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White crappie	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Yellow bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
583	Atlantic croaker	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Bay anchovy	4	4	4	4	4	4	4	4	4	4	4	4	4	-	APR-OCT	APR-OCT	JAN-DEC	-
	Black drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Crevalle jack	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gizzard shad	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gulf menhaden	5	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Red drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Sand seatrout	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Sheepshead	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Silver perch	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Southern flounder	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Spot	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Spotted seatrout	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Striped mullet	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
587	Bay anchovy	2	2	2	2	2	2	2	2	2	2	2	2	2	-	APR-OCT	APR-OCT	-	-
	Gizzard shad	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gulf menhaden	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Southern flounder	4	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Striped mullet	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
627	Bay anchovy	2	2	2	2	2	2	2	2	2	2	2	2	2	-	APR-OCT	APR-OCT	-	-
	Southern flounder	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
629	Atlantic croaker	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Bay anchovy	4	4	4	4	4	4	4	4	4	4	4	4	4	-	APR-OCT	APR-OCT	JAN-DEC	-
	Black drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Crevalle jack	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Red drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Sand seatrout	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Sheepshead	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Silver perch	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Southern flounder	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Spot	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Spotted seatrout	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-

HABITAT:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
449	Rare plant		X	X	X	X	X	X	X	X	X	X	X	X

INVERTEBRATE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
411	River shrimp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White river crawfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
583	Blue crab	4	4	4	3	3	3	3	3	3	3	3	3	4	-	-	-	JAN-DEC	-
	Brown shrimp	5	3	4	5	5	4	4	4	4	3	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Louisiana ESI: ESIMAP 27 (cont.)

BIOLOGICAL RESOURCES: (cont.)

INVERTEBRATE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
583	White shrimp	4	3	3	3	3	3	4	4	4	3	3	3	3	-	-	-	JAN-DEC	-
629	Blue crab	4	4	4	3	3	3	3	3	3	3	3	3	4	-	-	-	JAN-DEC	-
	Brown shrimp	5	3	3	4	5	5	4	4	4	4	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	White shrimp	4	3	3	3	3	3	4	4	4	3	3	3	3	-	-	-	JAN-DEC	-

REPTILE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Internesting	Juveniles	Adults
639	American alligator	661 TO 9 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
642	American alligator	1000 TO 250 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC

TERRESTRIAL MAMMAL:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
312	Louisiana black bear	T OCCUPIED	X	X	X	X	X	X	X	X	X	X	X	X
635	Common raccoon	86 TO 42 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink	223 TO 179 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat	36 TO 17 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter	2036 TO 828 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria	3 TO 2 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
638	Common raccoon	25 TO 23 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink	96 TO 56 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat	196 TO 53 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter	877 TO 728 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria	15 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X

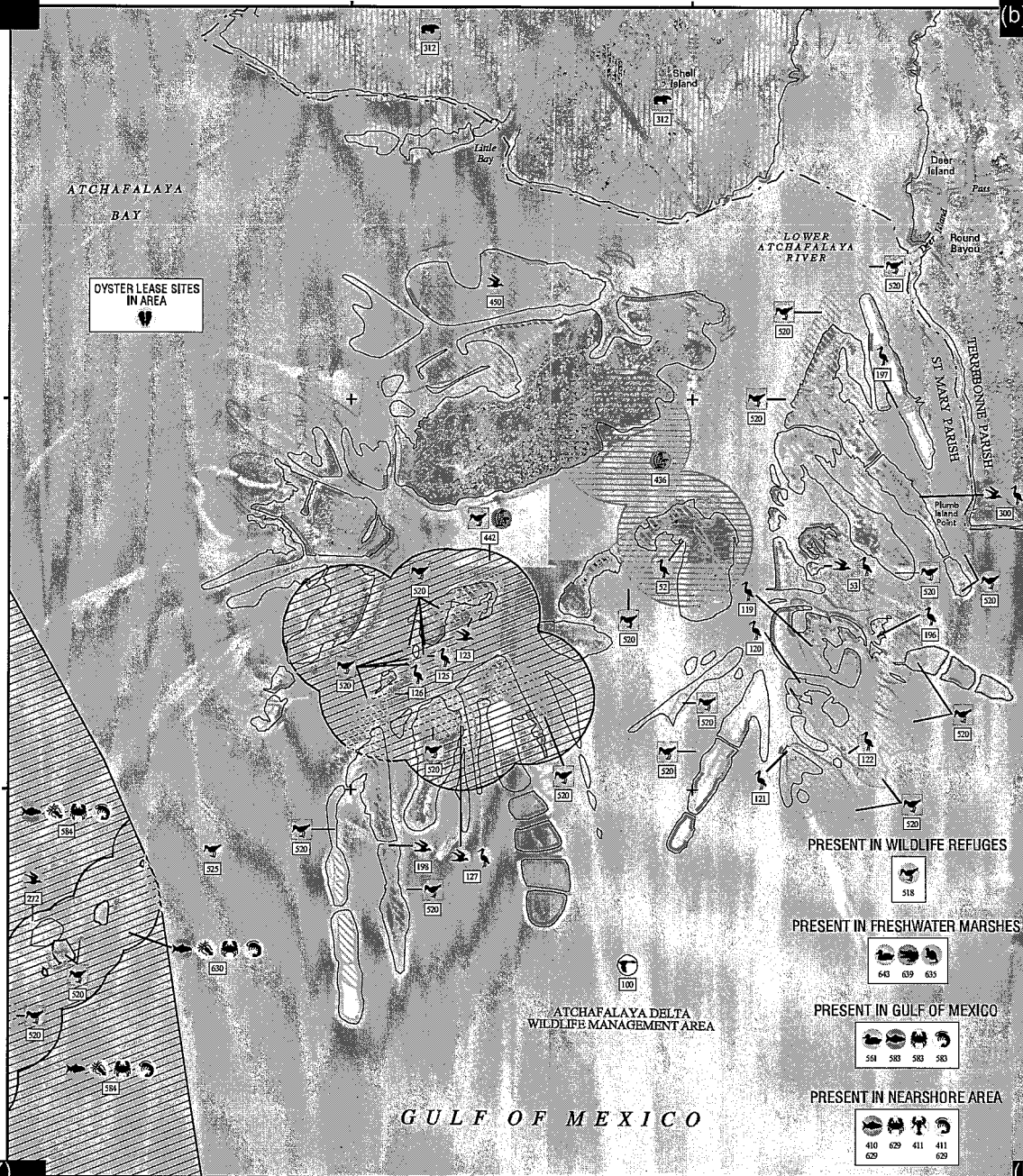
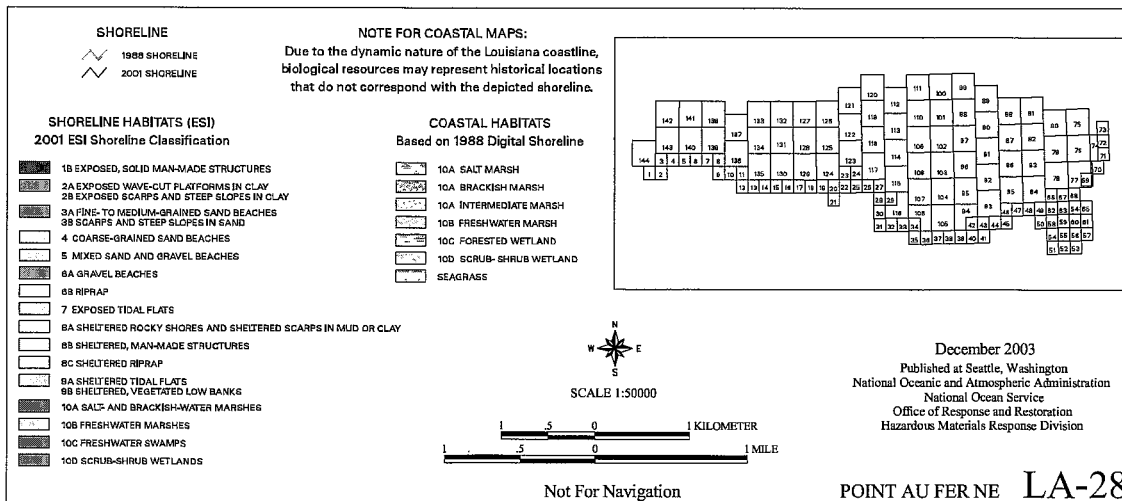
HUMAN USE RESOURCES:

WILDLIFE REFUGE:

HUN#	Name	Owner	Contact	Phone
100	ATCHAFALAYA DELTA WMA		LDWF	

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)
(F), (b)(b) (7)
(F), (b)

Louisiana ESI: ESIMAP 28 (cont.)

BIOLOGICAL RESOURCES: (cont.)

BIRD:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting
643	Northern pintail	2 TO 70 IND/SQ MI	X	X	X						X	X	X	X	-	-	-
	Northern shoveler	UP TO 24 IND/SQ MI	X	X	X	X					X	X	X	X	-	-	-
	Ring-necked duck	UP TO 56 IND/SQ MI	X	X	X						X	X	X	X	-	-	-

FISH:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults	
410	Alligator gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Bantam sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Bighead carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Bigmouth buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Black buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Black crappie	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Bluegill	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Bowfin	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Catfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Chubsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Common carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Freshwater drum	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Gizzard shad	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Grass carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Gulf menhaden	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Hybrid sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Largemouth bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Logperch	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Longear sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Minnows	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Orangespotted sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Paddlefish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Redear sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	River carpsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Shiners	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Shortnose gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Shovelnose sturgeon	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Silver carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Smallmouth buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Spotted gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
Spotted sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-		
Striped bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-		
Striped mullet	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-		
Threadfin shad	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-		
White bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-		
White crappie	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-		
Yellow bass	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-		
583	Atlantic croaker	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-	
	Bay anchovy	4	4	4	4	4	4	4	4	4	4	4	4	4	-	APR-OCT	APR-OCT	JAN-DEC	-	
	Black drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Crevalle jack	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Gizzard shad	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-	
	Gulf menhaden	5	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-	
	Red drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Sand seatrout	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-	
	Sheepshead	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Silver perch	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Southern flounder	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Spot	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-	
	Spotted seatrout	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Striped mullet	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-	
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
584	Atlantic croaker	5	5	5	5	5	5	5	5	5	5	5	5	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-	
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-	
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-	
	Crevalle jack	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Gizzard shad	4	3	3	3	3	3	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-	
	Gray snapper	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Gulf menhaden	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-	
	Red drum	3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-	
	Sand seatrout	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-	
	Sheepshead	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-	
	Silver perch	3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-	
	Southern flounder	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-	
	Spanish mackerel	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-	
	Spotted seatrout	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-	
Striped mullet	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-		
Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-		
629	Atlantic croaker	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-	
	Bay anchovy	4	4	4	4	4	4	4	4	4	4	4	4	4	-	APR-OCT	APR-OCT	JAN-DEC	-	
	Black drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Crevalle jack	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Red drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Sand seatrout	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-	
	Sheepshead	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Silver perch	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Southern flounder	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Spot	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-	
	Spotted seatrout	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
	630	Atlantic croaker	5	5	5	5	5	5	5	5	5	5	5	5	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-
		Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
		Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-
Crevalle jack		3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
Gray snapper		2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
Red drum		3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-	
Sand seatrout		4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-	
Sheepshead		4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-	
Silver perch		3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-	
Southern flounder		4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-	
Spanish mackerel		3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-	
Spot		5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-	
Spotted seatrout		3	3	3																

Louisiana ESI: ESIMAP 28 (cont.)

BIOLOGICAL RESOURCES: (cont.)

HABITAT:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
436	Rare plant		X	X	X	X	X	X	X	X	X	X	X	X
442	Rare plant		X	X	X	X	X	X	X	X	X	X	X	X

INVERTEBRATE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
411	River shrimp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White river crawfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
583	Blue crab	4	4	4	3	3	3	3	3	3	3	3	4	-	-	-	-	JAN-DEC	-
	Brown shrimp	5	3	3	4	5	5	4	4	4	4	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	White shrimp	4	3	3	3	3	3	4	4	4	3	3	3	3	-	-	-	JAN-DEC	-
584	Bay squid	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab	5	4	4	5	5	5	5	5	5	5	5	4	4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	3	4	5	5	5	5	5	5	4	4	3	3	-	-	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	APR-SEP	JAN-DEC	-
	White shrimp	5	3	3	4	5	5	5	5	5	5	5	4	4	-	-	APR-DEC	JAN-DEC	-
629	Blue crab	4	4	4	3	3	3	3	3	3	3	3	3	4	-	-	-	JAN-DEC	-
	Brown shrimp	5	3	3	4	5	5	5	4	4	4	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	White shrimp	4	3	3	3	3	3	4	4	4	3	3	3	3	-	-	-	JAN-DEC	-
630	Bay squid	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab	5	4	4	5	5	5	5	5	5	5	5	4	4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	3	4	5	5	5	5	5	5	4	4	3	3	-	-	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	APR-SEP	JAN-DEC	-
	White shrimp	5	3	3	4	5	5	5	5	5	5	5	4	4	-	-	APR-DEC	JAN-DEC	-

REPTILE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Interesting	Juveniles	Adults
639	American alligator	661 TO 9 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC

TERRESTRIAL MAMMAL:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
312	Louisiana black bear	T OCCUPIED	X	X	X	X	X	X	X	X	X	X	X	X
635	Common raccoon	86 TO 42 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink	223 TO 179 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat	36 TO 17 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter	2036 TO 828 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria	3 TO 2 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X

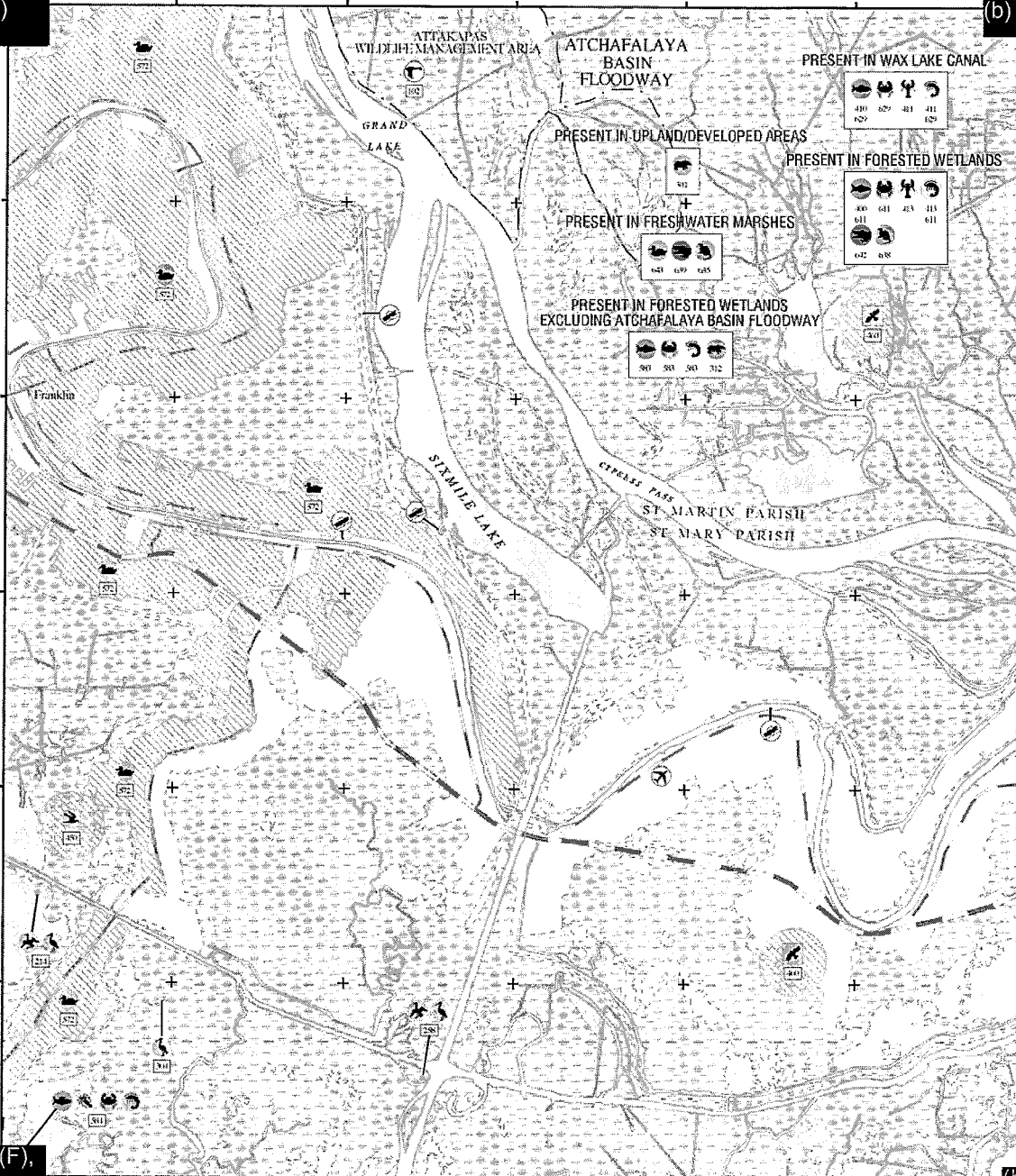
HUMAN USE RESOURCES:

WILDLIFE REFUGE:

HUN#	Name	Owner	Contact	Phone
100	ATCHAFALAYA DELTA WMA		LDWF	

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)
(F), (b)

SHORELINE



NOTE FOR COASTAL MAPS:

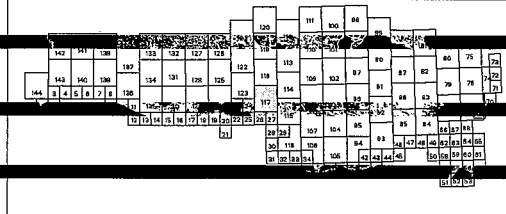
Due to the dynamic nature of the Louisiana coastline, biological resources may represent historical locations that do not correspond with the depicted shoreline.

SHORELINE HABITATS (ESI)
2001 ESI Shoreline Classification

- 1D EXPOSED, SOLID, MAN-MADE STRUCTURES
- 2A EXPOSED WAVE-CUT PLATFORMS IN CLAY
- 2B EXPOSED SCARPS AND STEEP SLOPES IN CLAY
- 3A FINE-TO MEDIUM-GRAINED SAND BEACHES
- 3B SCARPS AND STEEP SLOPES IN SAND
- 5 MIXED SAND AND GRAVEL BEACHES
- 6A GRAVEL BEACHES
- 6B GRAVEL
- 7 EXPOSED TIDAL FLATS
- 8A SHELTERED ROCKY SHORES AND SHELTERED SCARPS IN MUD OR CLAY
- 8B SHELTERED, MAN-MADE STRUCTURES
- 8A SHELTERED TIDAL FLATS
- 9B SHELTERED, VEGETATED LOW BANKS
- 10A SALF AND BRACKISH-WATER MARSHES
- 10C FRESHWATER SWAMPS

COASTAL HABITATS
Based on 1988 Digital Shoreline

- 10A BRACKISH MARSH
- 10A INTERMEDIATE MARSH
- 10B FRESHWATER MARSH
- 10D SCRUB-SHRUB WETLAND
- SEAGRASS



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National Ocean Service

Office of Response and Restoration

Hazardous Materials Response Division

Not For Navigation

MORGAN CITY

Louisiana ESI: ESIMAP 117

BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting
214	Anhinga	46 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUN	-	-
	Black-crowned night-heron	1 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-AUG	-	-
	Great blue heron	103 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-
	Great egret	137 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-
258	Anhinga	1 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUN	-	-
	Cattle egret	40 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	APR-AUG	-	-
	Great blue heron	1 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-
	Great egret	3 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-
	Little blue heron	79 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-
	Snowy egret	7 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-
	Yellow-crowned night-heron	1 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-AUG	-	-
304	Little blue heron	200 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-
	Snowy egret	50 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUL	-	-
450	Colonial waterbirds		X	X	X	X	X	X	X	X	X	X	X	X	NOV-SEP	-	-
460	Threatened raptor		X	X	X	X	X	X	X	X	X	X	X	X	OCT-MAY	-	-
572	American coot	T														-	-
	American wigeon	2 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Blue-winged teal	16 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Canvasback	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Gadwall	7 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Green-winged teal	23 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Hooded merganser	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Lesser scaup	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Mallard	19 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Mottled duck	4 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	45 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Northern shoveler	12 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Ring-necked duck	1 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
643	American coot	2 TO 215 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	American wigeon	1 TO 116 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Blue-winged teal	2 TO 30 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Canvasback	UP TO 21 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Gadwall	10 TO 243 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Green-winged teal	6 TO 86 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Hooded merganser	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Lesser scaup	UP TO 41 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Mallard	20 TO 99 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Mottled duck	3 TO 18 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	2 TO 70 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Northern shoveler	UP TO 24 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-
	Ring-necked duck	UP TO 56 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X		-	-

FISH:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
400	Alligator gar	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Atlantic needlefish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bantam sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bighead carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bigmouth buffalo	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black buffalo	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black crappie	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Blue catfish	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Blue sucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bluegill	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bowfin	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Channel catfish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Chubsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Common carp	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Flathead catfish	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Freshwater drum	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gizzard shad	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Grass carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf menhaden	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf pipefish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Hybrid sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Inland silverside	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Largemouth bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Lined sole	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Logperch	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Longear sunfish	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Madtom	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Minnows	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Orangespotted sunfish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Paddlefish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Redear sunfish	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	River carpsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shiners	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shortnose gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shovelnose sturgeon	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Silver carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Skipjack herring	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Smallmouth buffalo	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Speckled worm eel	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted gar	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted sunfish	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped mullet	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Threadfin shad	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Warmouth	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White bass	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White crappie	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Yellow bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
410	Alligator gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bantam sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bighead carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bigmouth buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black buffalo	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black crappie	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bluegill	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bowfin	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Catfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Louisiana ESI: ESIMAP 117 (cont.)

BIOLOGICAL RESOURCES: (cont.)

INVERTEBRATE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
611	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	White shrimp	4	3	3	3	3	4	4	4	3	3	3	3	3	-	-	-	JAN-DEC	-
629	Blue crab	4	4	4	3	3	3	3	3	3	3	3	3	4	-	-	-	JAN-DEC	-
	Brown shrimp	5	3	3	4	5	5	4	4	4	4	3	3	3	-	-	-	JAN-DEC	-
	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	White shrimp	4	3	3	3	3	4	4	4	4	3	3	3	3	-	-	-	JAN-DEC	-

REPTILE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Interneeting	Juveniles	Adults
639	American alligator	661 TO 9 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
642	American alligator	1000 TO 250 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC

TERRESTRIAL MAMMAL:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
301	Louisiana black bear	T TRANSIENT	X	X	X	X	X	X	X	X	X	X	X	X
312	Louisiana black bear	T OCCUPIED	X	X	X	X	X	X	X	X	X	X	X	X
635	Common raccoon	86 TO 42 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink	223 TO 179 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat	36 TO 17 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter	2036 TO 828 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria	3 TO 2 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
638	Common raccoon	25 TO 23 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink	96 TO 56 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat	196 TO 53 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter	877 TO 728 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria	15 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X

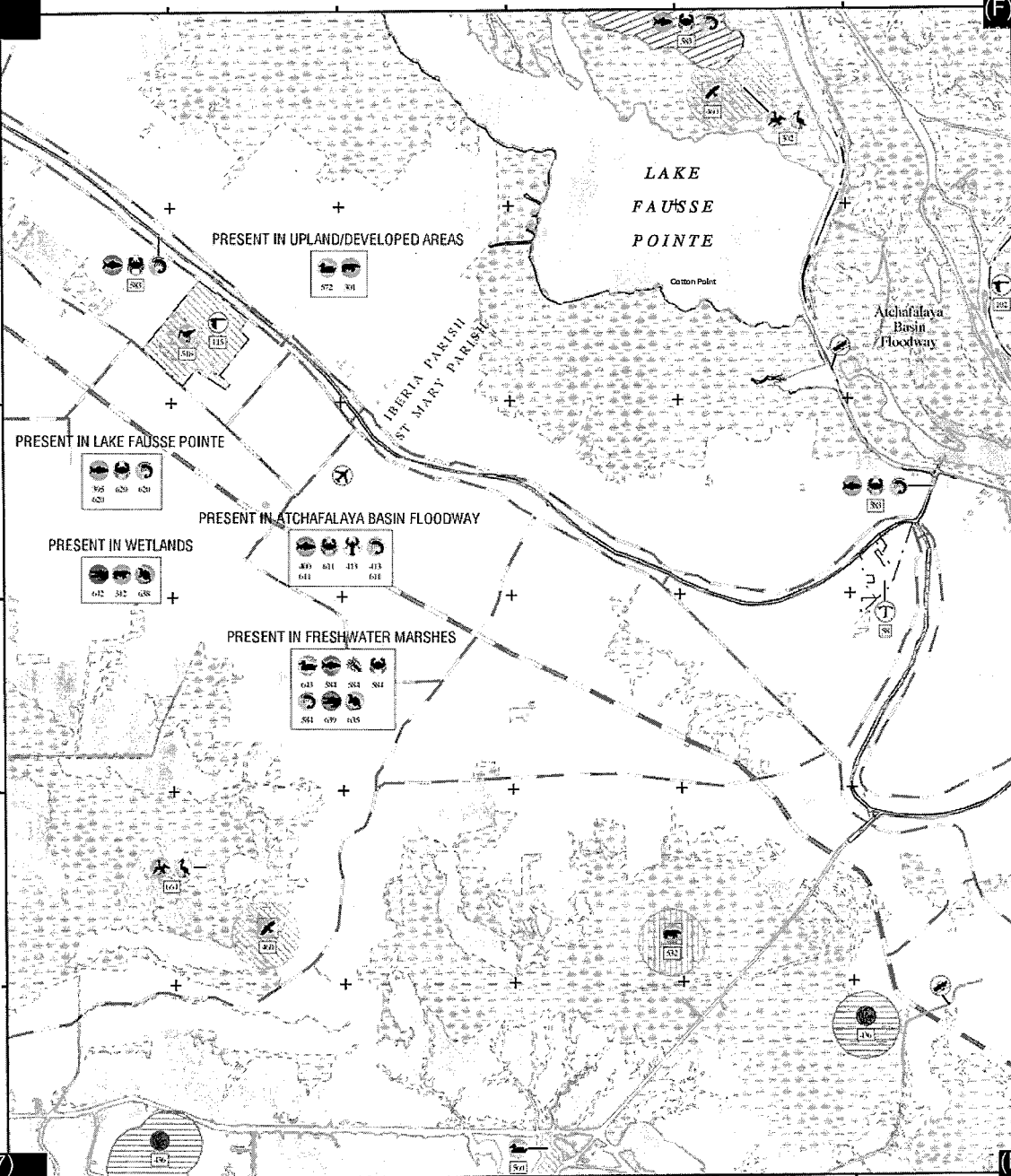
HUMAN USE RESOURCES:

WILDLIFE REFUGE:

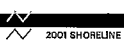
HUN#	Name	Owner	Contact	Phone
102	ATTAKAPAS ISLAND WMA		LDWF	

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)(F),
(b) (3)(b) (7)
(F), (b)(b) (7)
(F), (b)
(2)(b) (7)(F),
(b) (3)

SHORELINE



NOTE FOR COASTAL MAPS:

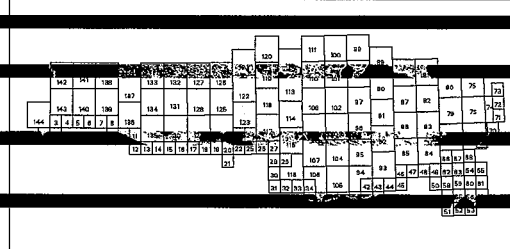
Due to the dynamic nature of the Louisiana coastline, biological resources may represent historical locations that do not correspond with the depicted shoreline.

SHORELINE HABITATS (ESI)
2001 ESI Shoreline Classification

- 1A EXPOSED, SAND MAN-MADE STRUCTURES
- 2A EXPOSED WAVE-CUT PLATFORMS IN CLAY
- 2B EXPOSED SCARPS AND STEEP SLOPES IN CLAY
- 3A FINE-TO MEDIUM-GRAINED SAND BEACHES
- 3B SCARPS AND STEEP SLOPES IN SAND
- 5 MIXED SAND AND GRAVEL BEACHES
- 6A GRAVEL BEACHES
- 6B RIPRAP
- 7 EXPOSED TIDAL FLATS
- 8A SHELTERED ROCKY SHORES AND SHELTERED SCARPS IN MUD OR CLAY
- 8B SHELTERED, MAN-MADE STRUCTURES
- 9A SHELTERED TIDAL FLATS
- 9B SHELTERED, VEGETATED LOW BANKS
- 10A SAND AND BRACKISH-WATER MARSHES
- 10C FRESHWATER SWAMPS

COASTAL HABITATS
Based on 1988 Digital Shoreline

- 10A BRACKISH MARSH
- 10A INTERMEDIATE MARSH
- 10B FRESHWATER MARSH
- 10C SCRUB-SHRUB WETLAND
- SEAGRASS



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Not For Navigation

MORGAN CITY

Louisiana ESI: ESIMAP 123

BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting
302	Anhinga	18 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUN	-	-
	Great blue heron	123 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-
	Great egret	235 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-
460	Threatened raptor	T	X	X	X	X	X	X	X	X	X	X	X	X	OCT-MAY	-	-
518	Shorebirds		X	X	X	X	X	X	X	X	X	X	X	X	-	-	-
560	Lesser scaup	13 IND/SQ MI	X	X	X										X X X	-	-
572	American coot	2 IND/SQ MI	X	X	X										X X X	-	-
	American wigeon	2 IND/SQ MI	X	X	X	X									X X X	-	-
	Blue-winged teal	16 IND/SQ MI	X	X	X	X	X								X X X X	-	-
	Canvasback	PRESENT	X	X	X										X X	-	-
	Gadwall	7 IND/SQ MI	X	X	X	X									X X X	-	-
	Green-winged teal	23 IND/SQ MI	X	X	X	X									X X X X	-	-
	Hooded merganser	PRESENT	X	X	X										X X	-	-
	Lesser scaup	PRESENT	X	X	X										X X X	-	-
	Mallard	19 IND/SQ MI	X	X	X										X X X	-	-
	Mottled duck	4 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	45 IND/SQ MI	X	X	X										X X X X	-	-
	Northern shoveler	12 IND/SQ MI	X	X	X	X									X X X X	-	-
	Ring-necked duck	1 IND/SQ MI	X	X	X										X X X	-	-
643	American coot	2 TO 215 IND/SQ MI	X	X	X										X X X	-	-
	American wigeon	1 TO 116 IND/SQ MI	X	X	X	X									X X X	-	-
	Blue-winged teal	2 TO 30 IND/SQ MI	X	X	X	X	X								X X X X	-	-
	Canvasback	UP TO 21 IND/SQ MI	X	X	X										X X	-	-
	Gadwall	10 TO 243 IND/SQ MI	X	X	X	X									X X X	-	-
	Green-winged teal	6 TO 86 IND/SQ MI	X	X	X	X									X X X X	-	-
	Hooded merganser	PRESENT	X	X	X										X X	-	-
	Lesser scaup	UP TO 41 IND/SQ MI	X	X	X										X X X	-	-
	Mallard	20 TO 99 IND/SQ MI	X	X	X										X X X	-	-
	Mottled duck	3 TO 18 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	2 TO 70 IND/SQ MI	X	X	X										X X X	-	-
	Northern shoveler	UP TO 24 IND/SQ MI	X	X	X	X									X X X X	-	-
	Ring-necked duck	UP TO 56 IND/SQ MI	X	X	X										X X	-	-
664	Anhinga	2 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	MAR-JUN	-	-
	Great blue heron	60 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-
	Great egret	133 IND (90-99AV)	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL	-	-

FISH:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
395	American eel	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Atlantic needlefish	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bigmouth buffalo	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black bullhead	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black crappie	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Blue catfish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bluegill	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bowfin	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Catfish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Channel catfish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Common carp	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Flathead catfish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Freshwater drum	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gizzard shad	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf menhaden	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Hogchoker	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Ladyfish	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Largemouth bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Longear sunfish	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Madtom	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Minnows	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Pirate perch	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Redear sunfish	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Smallmouth buffalo	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Southern flounder	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted gar	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped mullet	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Threadfin shad	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Violet goby	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Warmouth	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White crappie	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Yellow bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
400	Alligator gar	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Atlantic needlefish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bantam sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bighead carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bigmouth buffalo	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black buffalo	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black crappie	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Blue catfish	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Blue sucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bluegill	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bowfin	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Channel catfish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Chubsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Common carp	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Flathead catfish	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Freshwater drum	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gizzard shad	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Grass carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf menhaden	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf pipefish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Hybrid sunfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Inland silverside	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Largemouth bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Lined sole	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Logperch	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Longear sunfish	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Madtom	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Minnows	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Orangespotted sunfish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Paddlefish	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Louisiana ESI: ESIMAP 123 (cont.)

BIOLOGICAL RESOURCES: (cont.)

FISH:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
400	Redear sunfish	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	River carpsucker	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shiners	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shortnose gar	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Shovelnose sturgeon	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Silver carp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Skipjack herring	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Smallmouth buffalo	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Speckled worm eel	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted gar	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Spotted sunfish	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Striped mullet	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Threadfin shad	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Warmouth	LOW	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White bass	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White crappie	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Yellow bass	MED	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
583	Atlantic croaker	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Bay anchovy	4	4	4	4	4	4	4	4	4	4	4	4	4	-	APR-OCT	APR-OCT	JAN-DEC	-
	Black drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Crevalle jack	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gizzard shad	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gulf menhaden	5	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Red drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Sand seatrout	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Sheepshead	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Silver perch	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Southern flounder	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Spot	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Spotted seatrout	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Striped mullet	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
584	Atlantic croaker	5	5	5	5	5	5	5	5	5	5	5	5	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-
	Crevalle jack	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gizzard shad	4	3	3	3	3	3	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gulf menhaden	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Red drum	3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Sheepshead	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Silver perch	3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-
	Southern flounder	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Spanish mackerel	4	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Spotted seatrout	3	3	3	3	3	3	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
611	Atlantic croaker	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Black drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Crevalle jack	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Red drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Sand seatrout	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Sheepshead	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Silver perch	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Southern flounder	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Spot	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Spotted seatrout	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
620	Atlantic croaker	4	4	4	4	4	4	4	4	4	4	4	4	4	-	APR-OCT	APR-OCT	JAN-DEC	-
	Bay anchovy	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Black drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Crevalle jack	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Red drum	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Sand seatrout	4	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	JAN-DEC	-
	Sheepshead	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Silver perch	3	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Spot	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Spotted seatrout	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-

HABITAT:

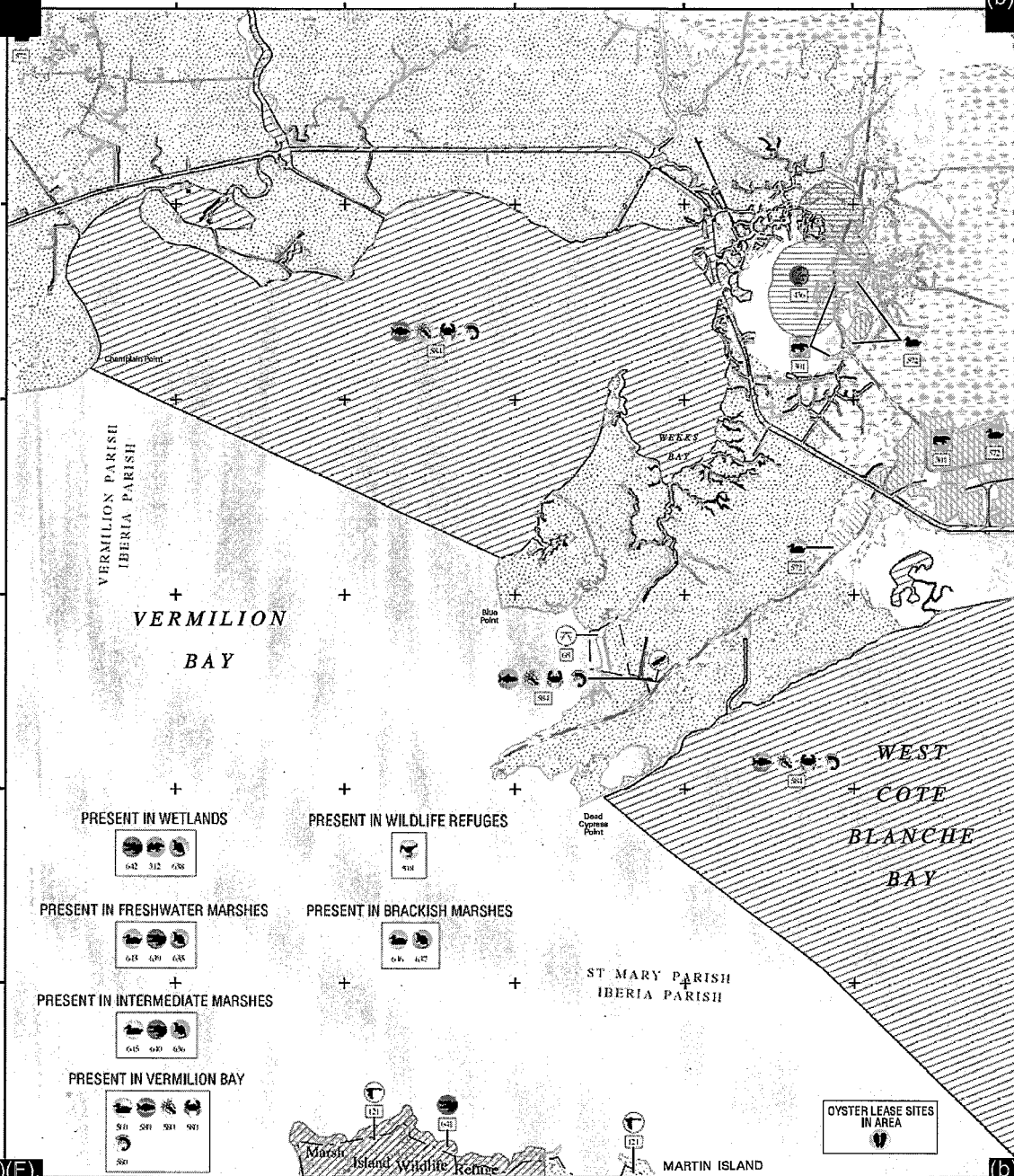
RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
436	Rare plant		X	X	X	X	X	X	X	X	X	X	X	X

INVERTEBRATE:

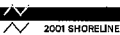
RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
413	Red swamp crawfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	River shrimp	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	White river crawfish	PRESENT	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
583	Blue crab	4	4	4	3	3	3	3	3	3	3	3	4	-	-	-	-	JAN-DEC	-
	Brown shrimp	5	3	3	4	5	4	4	4	4	3	3	3	-	-	-	-	JAN-DEC	-
	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	JAN-DEC	-
	White shrimp	4	3	3	3	3	3	3	3	3	3	3	3	-	-	-	-	JAN-DEC	-
584	Bay squid	3	3	3	3	3	3	3	3	3	3	3	3	-	MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab	5	4	4	5	5	5	5	5	5	5	5	4	-	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp	5	3	4	5	5	5	5	5	5	4	3	-	-	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Gulf stone crab	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	-	JAN-DEC	-
	Pink shrimp	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	APR-SEP	JAN-DEC	-
	White shrimp	5	3	3	4	5	5	5	5	5	5	5	4	-	-	-	APR-DEC	JAN-DEC	-
611	Blue crab	4	4	4	3	3	3	3	3	3	3	3	4	-	-	-	-	JAN-DEC	-
	Brown shrimp	5	3	3	4	5	4	4	4	3	3	3	-	-	-	-	-	JAN-DEC	-
	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	JAN-DEC	-
	White shrimp	4	3	3	3	3	3	3	3	4	4	3	3	-	-	-	-	JAN-DEC	-
620	Blue crab	4	4	4	3	3	3	3	3	3	3	3	4	-	-	-	-	JAN-DEC	-
	Brown shrimp	5	3	3	4	5	4	4	4	3	3	3	-	-	-	-	-	JAN-DEC	-
	Pink shrimp	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	JAN-DEC	-
	White shrimp	4	3	3	3	3	3	3	4	4	3	3	3	-	-	-	-	JAN-DEC	-

BIOLOGICAL RESOURCES: (cont.)

ENVIRONMENTAL SENSITIVITY INDEX MAP

(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)(b) (7)(F),
(b) (3)

SHORELINE



NOTE FOR COASTAL MAPS:

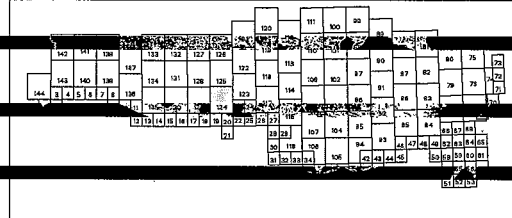
Due to the dynamic nature of the Louisiana coastline, biological resources may represent historical locations that do not correspond with the depicted shoreline.

SHORELINE HABITATS (ESI)
2001 ESI Shoreline Classification

- 1A EXPOSED, SAND-MAN-MADE STRUCTURES
- 2A EXPOSED WAVE-CUT PLATFORMS IN CLAY
- 2B EXPOSED SCARPS AND STEEP SLOPES IN CLAY
- 3A FINE-TO MEDIUM-GRAINED SAND BEACHES
- 3B SCARPS AND STEEP SLOPES IN SAND
- 5 MIXED SAND AND GRAVEL BEACHES
- 6A GRAVEL BEACHES
- 6B RIPRAP
- 7 EXPOSED TIDAL FLATS
- 8A SHELTERED ROCKY SHORES AND SHELTERED SCARPS IN MUD OR CLAY
- 8B SHELTERED, MAN-MADE STRUCTURES
- 9A SHELTERED TIDAL FLATS
- 9B SHELTERED, VEGETATED LOW BANKS
- 10A SALT AND BRACKISH-WATER MARSHES
- 10C FRESHWATER SWAMPS

COASTAL HABITATS
Based on 1988 Digital Shoreline

- 10A BRACKISH MARSH
- 10A INTERMEDIATE MARSH
- 10B FRESHWATER MARSH
- 10C SCRUB-SHRUB WETLAND
- SEAGRASS



SCALE 1:100,000

December 2003

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National Ocean Service
Office of Response and Restoration
Hazardous Materials Response Division

Not For Navigation

MORGAN CITY

Louisiana ESI: ESIMAP 124

BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Migrating	Molting
518	Shorebirds							X	X	X							
560	Lesser scaup	13 IND/SQ MI	X	X	X							X	X	X	-	-	-
572	American coot	2 IND/SQ MI	X	X	X							X	X	X	-	-	-
	American wigeon	2 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Blue-winged teal	16 IND/SQ MI	X	X	X	X	X					X	X	X	-	-	-
	Canvasback	PRESENT	X	X	X							X	X		-	-	-
	Gadwall	7 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Green-winged teal	23 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Hooded merganser	PRESENT	X	X	X							X	X		-	-	-
	Lesser scaup	PRESENT	X	X	X							X	X	X	-	-	-
	Mallard	19 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mottled duck	4 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	45 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Northern shoveler	12 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Ring-necked duck	1 IND/SQ MI	X	X	X							X	X	X	-	-	-
643	American coot	2 TO 215 IND/SQ MI	X	X	X							X	X	X	-	-	-
	American wigeon	1 TO 116 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Blue-winged teal	2 TO 30 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Canvasback	UP TO 21 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Gadwall	10 TO 243 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Green-winged teal	6 TO 86 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Hooded merganser	PRESENT	X	X	X							X	X		-	-	-
	Lesser scaup	UP TO 41 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mallard	20 TO 99 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mottled duck	3 TO 18 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	2 TO 70 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Northern shoveler	UP TO 24 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Ring-necked duck	UP TO 56 IND/SQ MI	X	X	X							X	X	X	-	-	-
645	American coot	33 TO 165 IND/SQ MI	X	X	X							X	X	X	-	-	-
	American wigeon	3 TO 73 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Blue-winged teal	9 TO 34 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Canvasback	UP TO 6 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Gadwall	36 TO 240 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Green-winged teal	9 TO 144 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Hooded merganser	PRESENT	X	X	X							X	X	X	-	-	-
	Lesser scaup	2 TO 35 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mallard	4 TO 66 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mottled duck	8 TO 15 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	UP TO 39 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Northern shoveler	4 TO 34 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Ring-necked duck	2 TO 36 IND/SQ MI	X	X	X							X	X	X	-	-	-
646	American coot	4 TO 42 IND/SQ MI	X	X	X							X	X	X	-	-	-
	American wigeon	5 TO 39 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Blue-winged teal	9 TO 21 IND/SQ MI	X	X	X	X	X					X	X	X	-	-	-
	Canvasback	UP TO 8 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Gadwall	46 TO 167 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Green-winged teal	23 TO 70 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Hooded merganser	UP TO 1 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Lesser scaup	2 TO 10 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mallard	3 TO 19 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Mottled duck	7 TO 17 IND/SQ MI	X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP	-	-
	Northern pintail	1 TO 56 IND/SQ MI	X	X	X							X	X	X	-	-	-
	Northern shoveler	6 TO 31 IND/SQ MI	X	X	X	X						X	X	X	-	-	-
	Ring-necked duck	UP TO 14 IND/SQ MI	X	X	X							X	X	X	-	-	-

FISH:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Atlantic croaker	5	5	5	5	5	5	5	5	5	4	4	4	5	MAR-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	JAN-MAY	JAN-MAY	JAN-MAY	JAN-DEC	-
	Crevalle jack	3	2	2	3	3	3	3	3	3	3	3	3	2	-	-	-	JAN-DEC	-
	Florida pompano	3	3	3	3	3	3	3	3	3	3	3	3	3	MAY-AUG	MAY-AUG	MAY-AUG	JAN-DEC	-
	Gizzard shad	4	3	3	3	4	4	3	3	3	3	3	3	3	MAR-SEP	MAR-SEP	MAR-SEP	JAN-DEC	-
	Gray snapper	3	2	2	2	3	3	3	3	3	3	2	-	-	-	-	-	JAN-DEC	-
	Gulf menhaden	5	5	5	5	5	5	5	5	5	5	5	5	5	-	AUG-APR	AUG-APR	JAN-DEC	-
	Red drum	4	3	3	3	3	4	4	4	4	3	3	3	3	AUG-MAR	AUG-MAR	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	4	4	4	4	4	4	3	3	-	FEB-OCT	FEB-OCT	FEB-OCT	JAN-DEC	-
	Sheepshead	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	JAN-JUL	JAN-DEC	-
	Silver perch	4	3	3	3	4	4	3	3	3	3	3	3	3	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Southern flounder	4	3	3	3	4	4	4	4	4	4	4	3	-	-	SEP-APR	JAN-DEC	-	-
	Spanish mackerel	3	2	2	3	3	3	3	3	3	3	3	2	-	-	-	JAN-DEC	-	-
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	OCT-APR	OCT-APR	OCT-APR	JAN-DEC	-
	Spotted seatrout	4	3	3	3	4	4	4	4	3	4	3	3	-	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet	4	4	4	4	4	4	4	4	4	4	4	4	4	-	NOV-FEB	OCT-MAY	JAN-DEC	-
	Tarpon	3	2	2	2	2	3	3	3	3	3	2	-	-	-	-	MAY-NOV	JAN-DEC	-
584	Atlantic croaker	5	5	5	5	5	5	5	5	5	4	4	4	5	MAR-DEC	MAR-DEC	JAN-DEC	JAN-DEC	-
	Bay anchovy	5	5	5	5	5	5	5	5	5	5	5	5	5	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-
	Black drum	3	3	3	3	3	3	3	3	3	3	3	3	3	FEB-APR	-	FEB-APR	JAN-DEC	-
	Crevalle jack	3	2	2	3	3	3	3	3	3	3	3	2	-	-	-	JAN-DEC	-	-
	Gizzard shad	4	3	3	3	4	4	3	3	3	3	3	3	-	-	-	JAN-DEC	-	-
	Gray snapper	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-
	Gulf menhaden	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Red drum	3	3	3	3	3	3	3	3	3	3	3	3	3	AUG-DEC	-	AUG-MAR	JAN-DEC	-
	Sand seatrout	4	3	3	3	4	4	4	4	4	4	3	3	-	-	-	JAN-DEC	-	-
	Sheepshead	4	3	3	3	4	4	4	4	4	4	4	3	-	-	-	JAN-DEC	-	-
	Silver perch	3	3	3	3	3	3	3	3	3	3	3	3	-	MAY-SEP	MAY-SEP	MAY-SEP	JAN-DEC	-
	Southern flounder	4	3	3	3	4	4	4	4	4	4	4	3	-	-	-	JAN-DEC	-	-
	Spanish mackerel	3	2	2	2	2	3	3	3	3	3	2	-	-	-	-	JAN-DEC	-	-
	Spot	5	5	5	5	5	5	5	5	5	5	5	5	5	-	-	-	JAN-DEC	-
	Spotted seatrout	3	3	3	3	3	3	3	3	3	3	3	3	-	MAR-OCT	MAR-OCT	MAR-OCT	JAN-DEC	-
	Striped mullet	4	4	4	4	4	4	4	4	4	4	4	4	4	-	-	-	JAN-DEC	-
	Tarpon	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	JAN-DEC	-

HABITAT:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D
436	Rare plant		X	X	X	X	X	X	X	X	X	X	X	X

INVERTEBRATE:

RAR#	Species	S F Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Bay squid	4	4	4	4	4	4	4	4	4	4	4	4	4	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	-

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Louisiana ESI: ESIMAP 124 (cont.)

BIOLOGICAL RESOURCES: (cont.)

INVERTEBRATE:

RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
580	Blue crab			5	4	4	5	5	5	5	5	5	5	5	5	4	-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp			5	4	5	5	5	5	5	5	5	4	4	3		JAN-DEC	JAN-DEC	JAN-DEC	-	
	Gulf stone crab			3	3	3	3	3	3	3	3	3	3	3	3		-	MAR-NOV	MAR-DEC	JAN-DEC	-
	Pink shrimp			5	3	3	5	5	5	3	3	3	3	3	3		-	-	APR-OCT	JAN-DEC	-
	White shrimp			5	3	3	5	5	5	5	5	5	5	5	4		APR-NOV	MAR-DEC	JAN-DEC	-	
584	Bay squid			3	3	3	3	3	3	3	3	3	3	3	3		MAR-DEC	MAR-DEC	MAR-DEC	JAN-DEC	-
	Blue crab			5	4	4	5	5	5	5	5	5	5	5	4		-	JAN-DEC	JAN-DEC	JAN-DEC	-
	Brown shrimp			5	3	4	5	5	5	5	5	5	4	4	3		-	-	JAN-DEC	JAN-DEC	-
	Gulf stone crab			3	3	3	3	3	3	3	3	3	3	3			-	-	-	JAN-DEC	-
	Pink shrimp			3	3	3	3	3	3	3	3	3	3	3			-	-	APR-SEP	JAN-DEC	-
	White shrimp			5	3	3	4	5	5	5	5	5	5	5	4		-	-	APR-DEC	JAN-DEC	-

REPTILE:

RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Interestening	Juveniles	Adults
639	American alligator			661 TO 9 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
640	American alligator			593 TO 38 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
641	American alligator			2257 TO 68 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC
642	American alligator			1000 TO 250 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X	JUN-AUG	AUG-SEP	-	JAN-DEC	JAN-DEC

TERRESTRIAL MAMMAL:

RAR#	Species	S	F	Conc.	J	F	M	A	M	J	J	A	S	O	N	D
301	Louisiana black bear			T TRANSIENT	X	X	X	X	X	X	X	X	X	X	X	X
312	Louisiana black bear			T OCCUPIED	X	X	X	X	X	X	X	X	X	X	X	X
635	Common raccoon			86 TO 42 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink			223 TO 179 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat			36 TO 17 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter			2036 TO 828 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria			3 TO 2 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
636	Common raccoon			77 TO 73 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink			329 TO 220 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat			99 TO 6 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter			1258 TO 423 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria			6 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
637	Common raccoon			68 TO 43 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink			466 TO 215 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat			9 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter			752 TO 373 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria			7 TO 5 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
638	Common raccoon			25 TO 23 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Mink			96 TO 56 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Muskrat			196 TO 53 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Northern river otter			877 TO 728 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X
	Nutria			15 TO 3 AC/NEST	X	X	X	X	X	X	X	X	X	X	X	X

HUMAN USE RESOURCES:

PARK:

HUN#	Name	Owner	Contact	Phone
68	CYPREMORT POINT STATE PARK		LA STATE LANDS	

WILDLIFE REFUGE:

HUN#	Name	Owner	Contact	Phone
121	MARSH ISLAND WMA		LDWF	

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Facility Response Plan

Appendix B Contact Lists

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Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Facility Response Plan

1.0 Company Contacts

Facility	Owner and Operator
Nautilus Pipeline Company, L.L.C.	Enbridge Offshore Gas Transmission
215 Nautilus Lane Centerville, Louisiana 70522	195 Equity Boulevard Houma, Louisiana 70360

Qualified Individuals

Name	Office	Mobile (24Hrs)	Home
Garry Worone	(832) 214-9380	(b) (6)	
Michael Shannon	(713) 821-1219		

Facility Contacts

Nautilus Operations Technician Info	Home	Cell	Alternate Phone
Office Phone: (337) 836-9510 Ext. 74123			
<i>A-Crew</i>			
Bryan Carpentier	(b) (6)		(337) 230-5903
Roy Hebert			(337) 376-8964
Kellie Robertson			(985) 991-5229
<i>B-Crew</i>			
Larry Bushnelle			(337) 578-3386
Brett McNabb			(338) 540-9318
Ralph Segura			(985) 372-1485

2.0 Federal Contacts

USCG National Response Center, Washington, DC	(800) 424-8802
USCG—MSU Morgan City	(985) 380-5320
USCG—MSU Lake Charles	(337) 491-7800
USCG—MSU Houma	(985) 857-8507
USCG Sector New Orleans	(504) 846-6184
USCG Search and Rescue	(504) 589-6225
U.S. EPA (Region VI-Dallas, TX)	(866) 372-7745
U.S. EPA On-Scene Coordinator	(800) 533-3508
U.S. Fish and Wildlife Service	(225) 578-4243
U.S. Army Corps of Engineers (New Orleans District)	(504) 862-2201
OSHA	(800) 321-6742
Wildlife Rehab and Education	(713) 861-9453
Wildlife Response Services LLC	(713) 705-5897 (281) 266-0054 (pager)

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Facility Response Plan

3.0 State Contacts

Louisiana One-Call (State Police)	(225) 925-6113
Louisiana Department of Environmental Quality	(866) 896-5337
Louisiana Oil Spill Coordinator	(225) 925-6606
Louisiana Department of Natural Resources	(225) 342-4500
Louisiana Department of Wildlife and Fisheries	(225) 765-2800
Louisiana Department of Public Safety	(337) 491-2511

4.0 Local Contacts

911	
Louisiana Poison Control	(800) 222-1222
Iberia Parish	
Iberia Parish Sheriff's Office-New Iberia	(337) 369-3714
Iberia Parish Office of Homeland Security (OHS) & Emergency Preparedness	(337) 369-4427
St. Martin Parish	
St. Martin Parish Sheriff's Office-St. Martinville	(337) 394-3071
St. Martin Parish Office of Homeland Security (OHS) & Emergency Preparedness	(337) 394-3071
Arnaudville Police Department	(337) 754-5913
Breaux Bridge Police Department	(337) 332-2186
Henderson Police Department	(337) 228-2065
St. Martinville Police Department	(337) 394-2226
Arnaudville Fire Department	(337) 754-5089
Breaux Bridge Fire Department	(337) 332-2795
Henderson Fire Department	(337) 228-2181
St. Martin Parish Fire District	(337) 332-1314
St. Mary Parish	
St. Mary Parish Sheriff's Office-Franklin	(337) 828-1960
St. Mary Parish Office of Homeland Security (OHS) & Emergency Preparedness	(337) 828-4100
Terrebonne Parish	
Terrebonne Parish Sheriff's Office-Houma	(985) 876-2500
Terrebonne Parish Office of Homeland Security (OHS) & Emergency Preparedness	(985) 873-6357
Houma Police Department	(504) 873-6306
Houma Fire Department	(985) 873-6391

5.0 Oil Spill Response Organizations

O'Brien Response Management Inc. (O'Brien's)	(985) 781-0804
Clean Harbors Environmental Services, Inc	(800) 645-8265
ES&H, Inc	(877) 437-2634
Ampol	(800) 482-6765

Nautilus Pipeline Company, L.L.C.
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6.0 Spill Tracking/Trajectories

Miros AS – Asker, Norway	+011 47 66 98 75 00
O'Brien's Response Management, Inc. – Slidell, LA	(985) 781-0804
Sea-Hawk Navigation AS – Bergen, Norway	+011 47 56 11 23 11
The Response Group – Houston, TX	(281) 880-5000
Eagle Information Mapping – Houston, TX	(281) 398-6001 ext. 240

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7.0 Spill Management Team

SPILL MANAGEMENT TEAM—NAUTILUS PIPELINE COMPANY, L.L.C. Command Post-O'Brien's Response Management Inc. (O'Brien's) 2000 Old Spanish Trail, Suite 210, Slidell, Louisiana 70458 (985) 781-0804 (24 Hour Number) / (985) 781-0580 (Fax)					
#	Name/Position	Loc #	Office	Email	Home Cellular
	Qualified Individual Mark Poteet-Enbridge Offshore Fred Whitted-Enbridge Offshore	1 1	(832) 214-9499 (713) 821-1219	mark.poteet@enbridge.com fred.whitted@enbridge.com	(b) (6)
1	Incident Commander Ed Stanton-O'Brien's Bud Kline-O'Brien's Ed Turner-O'Brien's Paul Frederick-O'Brien's Aaron Holton-O'Brien's Gil Berkins-O'Brien's Fred Whitted-Enbridge Offshore Mark Poteet-Enbridge Offshore	4 4 4 4 4 4 1 1	(985) 781-0804 (985) 781-0804 (985) 781-0804 (985) 781-0804 (985) 781-0804 (985) 781-0804 (713) 821-1219 (832) 214-9499	estanton@wittobriens.com ckline@wittobriens.com eturner@wittobriens.com pfrederick@wittobriens.com aholton@wittobriens.com gberkins@wittobriens.com fred.whitted@enbridge.com mark.poteet@enbridge.com	
2	Safety Officer Gil Berkins-O'Brien's Aaron Holton-O'Brien's Bud Kline-O'Brien's Michael Brockmyre - Enbridge Offshore Stan Shook - Enbridge Offshore	4 4 4 4 1	(985) 781-0804 (985) 781-0804 (985) 781-0804 (834) 214-9316	gberkins@wittobriens.com aholton@wittobriens.com ckline@wittobriens.com michael.brockmyer@enbridge.com	
3	Liaison Officer O'Brien's Duty Officer Les Stevens - Enbridge Offshore Terry McMillin - Enbridge Offshore	4 3 1	(985) 781-0804 (832) 214-1649 (713) 353-5670	les.stevens@enbridge.com terry.mcmillin@enbridge.com	
4	Information Officer Tim O'Leary-O'Brien's Terri Larson - Enbridge Offshore Larry Springer - Enbridge Offshore	5 1 1 1	(281) 320-9796 (713) 353-6317 (713) 821-2253	toleary@wittobriens.com terri.larson@enbridge.com larry.springer@enbridge.com	
5	Legal Officer James Sonnier - Enbridge Offshore Susan Schwager - Enbridge Offshore	1 1	(832) 214-9597 (713) 821-6325	james.sonnier@enbridge.com susan.schwager@enbridge.com	
6	Human Resources Joan Gay - Enbridge Offshore Rick Greenwalt - Enbridge Offshore	1 1	(713) 353-2225 (713) 353-2063	joan.gay@enbridge.com rick.greenwalt@enbridge.com	
7	Source Control Group Supv. Thomas Chemosky - Enbridge Offshore Cam Meyn - Enbridge Offshore Jehiel Lewis - Enbridge Offshore	1 1 1 1	(713) 821-2224 (832) 214-9302 (713) 821-2082	thomas.chemosky@enbridge.com cam.meyn@enbridge.com jehiel.lewis@enbridge.com	
8	Operations Section Chief Ed Turner-O'Brien's	4	(985) 781-0804	eturner@wittobriens.com	

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SPILL MANAGEMENT TEAM—NAUTILUS PIPELINE COMPANY, L.L.C. Command Post—O'Brien's Response Management Inc. (O'Brien's) 2000 Old Spanish Trail, Suite 210, Slidell, Louisiana 70458 (985) 781-0804 (24 Hour Number) / (985) 781-0580 (Fax)						
#	Name/Position	Loc #	Office	Email	Home	Cellular
	Bud Kline—O'Brien's	4	(985) 781-0804	ckline@wittobriens.com		(b) (6)
	Gil Berkins—O'Brien's	4	(985) 781-0804	gberkins@wittobriens.com		
	Paul Frederick—O'Brien's	4	(985) 781-0804	pfrederick@wittobriens.com		
	Aaron Holton—O'Brien's	4	(985) 781-0804	aholton@wittobriens.com		
	Jason Bergeron—O'Brien's	5	(281) 414-7742	jbergeron@wittobriens.com		
	Skipper Smith—O'Brien's	4	(985) 781-0804	ssmith@wittobriens.com		
	Christine Storm – Enbridge Offshore	2	(337) 569-2286	christine.storm@enbridge.com		
	John Brennan – Enbridge Offshore	3	(832) 214-1609	john.brennan@enbridge.com		
9	Recovery & Prot. Branch Dir.					
	TBD by O'Brien's	4	(985) 781-0804			
10	Staging Area Manager					
	TBD by O'Brien's	4	(985) 781-0804			
11	Disposal Group					
	TBD by O'Brien's	4	(985) 781-0804			
12	Wildlife Branch Director					
	Wildlife Center of Texas	6	(713) 861-9453	sharonschmalz@wildlifecenterofexas.org		
	Wildlife Response Services	7	(713) 705-5897	Rhonda.Murgatroyd@wildliferesponse.net		
13	Planning Section Chief					
	Bud Kline—O'Brien's	4	(985) 781-0804	ckline@wittobriens.com		
	Ed Turner—O'Brien's	4	(985) 781-0804	eturner@wittobriens.com		
	Paul Frederick—O'Brien's	4	(985) 781-0804	pfrederick@wittobriens.com		
	Gil Berkins—O'Brien's	4	(985) 781-0804	gberkins@wittobriens.com		
	Aaron Holton—O'Brien's	4	(985) 781-0804	aholton@wittobriens.com		
	Jason Bergeron—O'Brien's	5	(281) 414-7742	jbergeron@wittobriens.com		
	Suzanne Lacido—O'Brien's	4	(985) 781-0804	slacido@wittobriens.com		
	Candice Bersani – Enbridge	2	(832) 214-5738	candice.bersani@enbridge.com		
	Depp Charamie – Enbridge Offshore	3	(832) 214-1606	depp.cheranie@enbridge.com		
14	Situation Unit Leader					
	TBD by O'Brien's	4	(985) 781-0804			
15	Resource Unit Leader					
	TBD by O'Brien's	4	(985) 781-0804			
	Matt Howard – Enbridge Offshore	3	(832) 214-1608	matt.howard@enbridge.com		
16	Documentation Unit Leader					
	TBD by O'Brien's	4	(985) 781-0804			
17	Technical Specialists					
	TBD by O'Brien's	4	(985) 781-0804			
18	Logistics Section Chief					
	Ed Turner—O'Brien's	4	(985) 781-0804	eturner@wittobriens.com		
	Bud Kline—O'Brien's	4	(985) 781-0804	ckline@wittobriens.com		
	Gil Berkins—O'Brien's	4	(985) 781-0804	gberkins@wittobriens.com		

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SPILL MANAGEMENT TEAM—NAUTILUS PIPELINE COMPANY, L.L.C. Command Post—O'Brien's Response Management Inc. (O'Brien's) 2000 Old Spanish Trail, Suite 210, Slidell, Louisiana 70458 (985) 781-0804 (24 Hour Number) / (985) 781-0580 (Fax)					
#	Name/Position	Loc #	Office	Email	Home Cellular
	Paul Frederick—O'Brien's Aaron Holton—O'Brien's Jason Bergeron—O'Brien's Skipper Smith—O'Brien's Wayne Michel – Enbridge Offshore	4 4 5 4	(985) 781-0804 (985) 781-0804 (281) 414-7742 (985) 781-0804	pfrederick@wittobriens.com aholton@wittobriens.com jbergeron@wittobriens.com ssmith@wittobriens.com	(b) (6)
19	Service Branch Director TBD by O'Brien's	4	(985) 781-0804		
20	Support Branch Director TBD by O'Brien's	4	(985) 781-0804		
21	Communications Unit Leader TBD by O'Brien's	4	(985) 781-0804		
22	Finance Section Chief Keith Towler—O'Brien's Ramon Garcia – Enbridge Offshore	4 1	(985) 781-0804 (832) 214-5774	ktowler@wittobriens.com ramon.garcia@enbridge.com	
23	Procurement Unit Leader TBD by O'Brien's Jerry Walker – Enbridge Offshore Ruby Lindsey – Enbridge Offshore	4 1 1	(985) 781-0804 (713) 821-2258 (713) 821-2207	jerry.walker@enbridge.com ruby.lindsey@enbridge.com	
24	Comp./Claims Unit Leader TBD by O'Brien's	4	(985) 781-0804		
25	Cost Unit Leader TBD by O'Brien's	4	(985) 781-0804		

SPILL MANAGEMENT TEAM – These locations correspond with numbers listed above.		
#1	#2	#3
Enbridge – Houston, Texas 1100 Louisiana Street, Suite 3300 Houston, Texas 77002	Enbridge—Cameron, LA 4918 Gulf Beach Highway Cameron, LA 70631	Enbridge—Houma, LA 195 Equity Blvd Houma, LA 70360
#4	#5	#6
O'Brien's Gulf Coast – Incident Command Post 2000 Old Spanish Trail, Suite 210 Slidell, LA 70458	O'Brien's GOM Regional Office 818 Town & Country Blvd., Suite 200 Houston, TX 77024	The Wildlife Center of Texas 7007 Katy Road Houston, TX 77024
#7		
Wildlife Response Services – Seabrook P. O. Box 842 Seabrook, Texas 77586		

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8.0 Connecting Carrier Notification

Platform	Company	Platform Cell Phone	Platform Phone	Fax
SS 207	EOGT	(b) (6)	(832) 464-1631	(832) 464-1664
SS 332	EOGT		(832) 464-1625	(832) 464-1661
SMI 76	EOGT		(832) 464-1635	(832) 464-1667
Venice	EOGT		(832) 464-1652	(832) 464-1665
Wayne Michel	Lead Operator "A"		(832) 464-1627	(832) 464-1661
John Sablan	Lead Operator "B"		(832) 464-1627	(832) 464-1661

Venice Facility

1565 Tidewater Road
Venice, LA 70091
Emergency Cell: (b) (6)
Fax: (832) 464-1654

Name and Crew	Title	Email	Home Number
John (Joey) Bubrig – A-Crew	Onshore Operator	John.Bubrig@Enbridge.com	(b) (6)
Joey Rojas			
Bobby Prout – B-Crew	Onshore Operator	Bobby.Prout@Enbridge.com	

Houma Office

195 Equity Blvd.
Houma, LA 70360
Phone: (985) 851-7166 or 7266
Fax: (985) 851-4126

Name and Crew	Title	Email	Home Number
John Brennan – A Crew	Operations Supervisor	John.Brennan@Enbridge.com	(b) (6)
Depp Cheramie – A Crew	I&E Specialists	Depp.Cheramie@Enbridge.com	
Carla Theriot – A Crew	Sr. Office Assistant	Carla.Theriot@Enbridge.com	
Matt Howard – B Crew	Maintenance Inspector	Matthew.Howard@Enbridge.com	
Leslie (Les) Stevens – B Crew	Offshore Operator	Leslie.Howard@Enbridge.com	
Cathy Brown	Admin Assistant	Cathy.Brown@Enbridge.com	

SS 207

Emergency Cell: (b) (6)
Phone: (832) 464-1630, 1631, 1632, 1633, 1634
Fax: (832) 464-1664

Name and Crew	Title	Email	Home Number
Stanley Primeaux – A Crew	Offshore Operator	Stanley.Primeaux@Enbridge.com	(b) (6)
Jacob Fontenot	Offshore Operator		
Roland Mullin – B Crew	Offshore Operator	Roland.Mullin@Enbridge.com	
David Doughty – B Crew	I & E Tech	David.Doughty@Enbridge.com	

SS 332

Emergency Cell: (b) (6)
Phone: (832) 464-1625, 1626, 1627, 1628, 1629
El Paso "A" (832) 676-7311
El Paso "B" (210) 528-2900
Fax: (832) 464-1661

Name and Crew	Title	Email	Home Number
Wayne Michel – A Crew	Offshore Supervisor	Wayne.Michel@Enbridge.com	(b) (6)
Brett McNabb – A Crew	Offshore Operator	Brett.McNabb@Enbridge.com	
Brady Augustine – A Crew	Offshore Operator	Brady.Augustine@Enbridge.com	
Craig Bascle – A Crew	I&E Tech	Craig.Bascle@Enbridge.com	
John Sablan – B Crew	Offshore Supervisor	John.Sablan@Enbridge.com	
Tommy George – B Crew	Offshore Operator	Tommy.George@Enbridge.com	
Chris Brown – B Crew	Offshore Operator		
James Stahl – B Crew	Offshore Operator	James.Stahl@Enbridge.com	
Nathaniel Cummings – B Crew	Operations Tech	Nathaniel.Cummings@Enbridge.com	

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Name and Crew	Title	Email	Home Number
Burt Guillory			
Bradley Keller			
SMI 76			
Emergency Cell: (b) (6)			
Phone (832) 464-1635, 1636, 1637			
Fax: (832) 464-1667			
Name and Crew	Title	Email	Home Number
Carroll Chouest, Jr. - A Crew	Offshore Operator	Carol.Chouest@Enbridge.com	(b) (6)
Carl Sandlin - A Crew	Offshore Operator	Carl.Sandlin@Enbridge.com	
Terry St. Amant - B Crew	Offshore Operator	Terry.StAmant@Enbridge.com	

Facility	Phone
Enbridge Gas Control	(877) 548-1800
Neptune Plant	(337) 836-0014
Customers	Phone
Texas Gas Control	800-626-1948
LIG Gas Control	318-619-5687
Gulf South Gas Control	800-850-0051
ANR Gas Control	800-231-2800 South East ANR Controller
ANR Patterson Plant	985-395-5657
Tennessee Gas Control	800-231-2800 Southern Controller
Acadian Gas Control	800-600-6240
Cypress Gas Control	800-600-6240
Plains Operation Center	432-686-1709

9.0 Support and Supply Organizations

Helicopters	
Petroleum Helicopters, Inc. – Houma	(985) 868-1705
Tex-Air Helicopters – Houma	(985) 534-4191
Air Logistics – Houma	(985) 851-6232
Air Logistics-Venice	(985) 534-7481
ERA Helicopters – Houma	(985) 868-0817
ERA Helicopters-Abbeville	(337) 898-2386
ERA Helicopters-Cameron	(337) 775-5574
ERA Helicopters-Fourchon	(985) 396-2285
ERA Helicopters-Morgan City	(985) 702-1360
PHI, Gulf of Mexico Scheduling-Lafayette	(800) 235-2452
Petroleum Helicopters, Inc. – Boothville	(985) 534-2631
Petroleum Helicopters, Inc. – Cameron	(337) 775-7157
Petroleum Helicopters, Inc. – Fourchon	(985) 396-2350
Petroleum Helicopters, Inc. – Houma	(985) 868-1705
Petroleum Helicopters, Inc. – Intracoastal City	(337) 893-1428
Petroleum Helicopters, Inc. – Lafayette	(337) 272-4210
Petroleum Helicopters, Inc. – Lake Charles	(337) 479-0610
Petroleum Helicopters, Inc. – Morgan City	(985) 631-2131
Petroleum Helicopters, Inc. – New Orleans/Harahan	(504) 733-7673

Medical Services	
Louisiana Poison Control	(800) 222-1222
Iberia Parish	

Nautilus Pipeline Company, L.L.C.
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Medical Services	
Iberia Medical Center – New Iberia	(337) 364-0441
St. Martin Parish	
St. Martin Hospital-Breaux Bridge	(337) 332-2178
St. Mary Parish	
Franklin Foundation Hospital-Franklin	(337) 828-0760
Teche Regional Medical Center-Morgan City	(985) 384-2200
Terrebonne Parish	
Leonard J. Chabert Medical Center-Houma	(985) 873-2200
Terrebonne General Hospital-Houma	(985) 873-4141

Media	
Lafayette	
KADN TV 15 (FOX)	(337) 237-1500
KATC TV 3 (ABC)	(337) 253-3333
KLFY TV 10 (CBS)	(337) 981-4823
KLAF TV 17 (UPN)	(337) 237-1500
Baton Rouge	
WAFB TV 9 (CBS)	(225) 383-9999
WBRZ TV 2 (ABC)	(225) 387-2222
WBXH TV 39 (UPN)	(225) 383-9999
WGMB TV 44 (FOX)	(225) 766-3233
WVLA TV 33 (NBC)	(225) 766-3233
Lake Charles	
KPLC TV 7 (NBC)	(337) 437-7568
KVPH TV 29 (FOX)	(337) 474-1316
New Orleans	
WWL TV 4 (CBS)	(504) 529-4444
WDSU TV 6 (NBC)	(504) 679-0600
WVUE TV 8 (FOX)	(504) 483-1540
WGNO TV 26 (ABC)	(504) 525-3838
WNOL TV 38 (WB)	(504) 525-8141
National Weather Service	(504) 522-7330
WWL (870 AM) Radio–New Orleans	(504) 593-6376

Lodging	
Best Western	(800) 528-1234
Courtyard (Marriot)	(800) 321-2211
Comfort Suites	(800) 424-6423
Days Inn	(800) 325-2525
Embassy Suites	(800) 362-2779
Hilton Hotels	(800) 445-8667
Holiday Inns	(800) 465-4329
Hyatt Hotels	(800) 228-9000
Marriott Hotels	(800) 228-9290
La Quinta Inn	(800) 531-5900
Quality Inns	(800) 228-5151
Ramada Inns	(800) 272-6232
Sheraton Hotels	(800) 325-3535

GULF OF MEXICO
REGIONAL OIL SPILL RESPONSE PLAN- OFFSHORE OPERATIONS
APPENDIX D - CONTRACTUAL AGREEMENTS
ENBRIDGE OFFSHORE (GAS GATHERING) L.L.C.

FIGURE D.1
PROOF OF CONTRACTUAL AGREEMENTS

* * * * *

I hereby certify that Enbridge Offshore (Gas Gathering) L.L.C. currently has a contract or membership agreement with the following Service Providers:

Service	Company	Beginning Date	Ending Date
Spill Management Team	O'Brien's	1/1/2005	Self-renewing
Equipment Provider	CGA	1/1/2005	Self-renewing
Dispersant/Aircraft	ASI	2/23/2009	Self-renewing
Response Personnel	MSRC	1/1/2005	Self-renewing

The subject contract or membership agreement provides immediate access to available personnel and/or equipment on a 24-hour per day basis.

Signed: _____

Title: _____

Date: _____

[Signature]

GENERAL MANAGER

FEB. 23/09

STANDBY EMERGENCY RESPONSE AGREEMENT

This Agreement is made this 21st day of February 2005, by and between Clean Harbors Environmental Services, Inc., and affiliates, a Massachusetts corporation, with offices located at 1501 Washington Street, P.O. Box 859048 Braintree, Massachusetts, 02185-9048, ("Contractor") and Stingray Pipeline Company, L.L.C., a Delaware limited liability company, with its principal place of business at 1100 Louisiana, Suite 3300, Houston, Texas 77002 ("Customer").

WHEREAS, Contractor is engaged in the business of providing Emergency Response Services ("Services") to respond to discharges of oil or other hazardous substances; and

WHEREAS, Customer desires to engage Contractor to provide such Services; and

WHEREAS, Customer and Contractor desire to establish the terms and conditions pursuant to which such Services will be provided.

NOW, THEREFORE, in consideration of the mutual covenants contained herein and for other good and valuable consideration, the sufficiency and receipt of which are hereby acknowledged, the parties, intending to be legally bound, agree as follows:

ARTICLE 1. Purpose

- 1.1 This Agreement establishes the terms and conditions pursuant to which Contractor may furnish Customer with certain Services in connection with response to discharges of oil or other hazardous substances.
- 1.2 This Agreement shall not obligate Customer to purchase Services from Contractor, nor shall it obligate Contractor to provide Services, but shall govern all orders for Services issued by Customer and which are accepted by Contractor. Contractor will use best efforts to respond to requests by Customer for Services.

ARTICLE 2. Scope of Services

- 2.1 The Services contemplated in connection with the response to discharges of oil or other hazardous substances may include, but not be limited to, the following:
 - Containment, recovery, repackaging and removal of materials;
 - Site evaluation, decontamination and restoration;
 - Transportation, storage, treatment or disposal of wastes;
 - Technical services, including sampling, laboratory analysis, and other related services;
 - Standby of personnel and equipment in anticipation of imminent activation;
 - Training and mock spill drill deployments.

ARTICLE 3. Contractor's Warranties

- 3.1 Contractor shall provide supervision, labor, materials, tools, equipment and subcontracted items for the performance of the Services.
- 3.2 Contractor shall take necessary precautions for the safety of its employees, and shall comply with applicable provisions of the Occupational Safety and Health Act. It is understood and agreed, however, that Contractor shall not be responsible for the elimination or abatement of safety hazards created by or otherwise resulting from work being performed by Customer's employees, its other contractors or agents.
- 3.3 Contractor represents that it holds the permits and licenses required for the performance of Services.

ARTICLE 4. Customer's Warranties

- 4.1 Customer shall provide full and complete information regarding its requirements for the Services.
- 4.2 Customer shall designate a representative ("Customer's Representative") who shall be fully acquainted with the Services to be provided hereunder and who shall be authorized to approve changes in the Services; render decisions promptly; authorize commitments and expenditures on behalf of Customer; approve Contractor's daily worksheets and to accept, verify and approve Contractor's invoices.
- 4.3 Customer shall be responsible for repairs to all private property, roadways, structures and rights-of-way resulting from Contractor's reasonable use thereof.
- 4.4 Customer represents and warrants that it shall provide payment to Contractor for the services provided by Contractor as set forth in Article 5, and shall demonstrate to Contractor's satisfaction prior to the commencement of the Services, and at such other times as Contractor may require, that sufficient funds are available and committed by Customer for the entire cost of the Services. Unless such financial assurances are provided by Customer, Customer agrees that Contractor shall not be required to commence or continue any Services and may immediately stop work. The failure of Contractor to insist upon the provisions of this paragraph at any one time shall not constitute a waiver of Customer's obligation to make payments pursuant to this Agreement nor shall it constitute a waiver of Contractor's right to request that evidence of sufficient funds be provided by Customer at a later date.
- 4.5 Customer shall communicate to Contractor all special hazards or risks known to or learned by the Customer during the term hereof which are related to the performance of Services pursuant to this Agreement.

ARTICLE 5. Compensation

- 5.1 Customer agrees to pay Contractor for Services in accordance with Contractor's Rate Schedule for emergency response work ("Rates") in effect at the time Services are rendered. Customer hereby assigns to Contractor all rights to any insurance payments that Customer may be entitled to receive to pay for the Services provided under this Agreement and hereby authorizes its insurance company or agent to pay Contractor directly. Customer's obligation to pay amounts due pursuant to this Agreement shall not be conditioned upon or limited by the types, amounts or availability of insurance

- coverage.
- 5.2 Contractor will present its first invoice to Customer as soon as possible following commencement of Services provided hereunder, and may issue subsequent invoices every five (5) days thereafter. Customer agrees to pay the full amount of each invoice amount within five (5) business days of the date of receipt of said invoice by Customer's Representative.
 - 5.3 Customer agrees that interest shall accrue and will be paid to Contractor on any unpaid balance of any invoice after five (5) business days of receipt of invoice by Customer at the rate of one and one half percent (1.5%) per month or the maximum amount allowed by law.
 - 5.4 In the event that legal or other action is required to collect unpaid balances of invoices due Contractor, Customer agrees to pay all costs of collection, litigation or settlement incurred by Contractor, including reasonable attorneys fees. "Legal or other action" as used above shall include bankruptcy and insolvency proceedings.
 - 5.5 In the event that work is suspended or terminated for any reason prior to the completion of the Services, Customer agrees to pay for labor, equipment, materials, disposal and other costs incurred by Contractor at the Rates and for reasonable demobilization costs.
 - 5.6 Customer agrees to pay Contractor in accordance with the Rates for any litigation support or testimony provided by Contractor in connection with, or arising out of, the work performed by Contractor hereunder.

ARTICLE 6. Changes in Work

- 6.1 Customer agrees to pay Contractor at the Rates for any costs incurred or delays resulting from Contractor's response to any emergency condition which threatens safety of persons or property during the performance of the Services.
- 6.2 If any change occurs during the term of this Agreement with respect to any laws, rules, regulations or ordinances which affect the rights or obligations of Customer or Contractor under this Agreement, or the applicability of any taxes or fees, or the cost of handling waste materials, Customer and Contractor shall negotiate in good faith to bring this Agreement into conformance with such change or changes. In the event that such agreement cannot be reached, Customer or Contractor shall have the right to terminate this Agreement immediately upon written notice to the other party.

ARTICLE 7. Insurance

- 7.1 Contractor shall keep in effect during the term of this Agreement the following insurance coverages:

COVERAGE	LIMITS
Worker's Compensation	Statutory
Auto Liability	\$1 million per occurrence
	\$1 million aggregate

- ## ARTICLE 8. Indemnification

- 8.1 Contractor shall indemnify, defend and hold harmless Customer, its parent and affiliated companies and their respective directors, officers, employees and agents from and against any and all costs, liabilities, claims, demands and causes of action including, without limitation, bodily injury to or death of any person or destruction of or damage to any property, except natural resource and other damages as provided in Section 8.3, which Customer may suffer, incur, or pay out, to the extent such are caused by the negligence or willful misconduct of Contractor, its agents or employees during the performance of this Agreement, or Contractor's failure to comply with any laws, regulations or lawful authority, or failure to comply with its obligations under this Agreement; except to the extent such liabilities, claims, demands and causes of action result from Customer's failure to comply with any laws, regulations or other lawful authority, or Customer's failure to comply with its obligations under this Agreement or result from the negligence or willful misconduct of Customer, its employees or agents.
- 8.2 Customer shall indemnify, defend and hold harmless Contractor, its parent and affiliated companies and their respective directors, officers, employees and agents from and against any and all costs, liabilities, claims, demands and causes of action including, without limitation, any bodily injury to or death of any person or destruction of or damage to property which Contractor may suffer, incur, or pay out, to the extent such are caused by the negligence or willful misconduct of Customer, its employees or agents or the failure of Customer to comply with any laws, regulations or other lawful authority or the failure of Customer to comply with its duties or obligations under this Agreement; except to the extent such liabilities, claims, demands and causes of action result from Contractor's failure to comply with any laws, regulations or lawful authority, or Contractor's failure to comply with its obligations under this Agreement or result from the negligence or willful misconduct of Contractor, its employees or agents.
- 8.3 Notwithstanding the foregoing, Customer shall indemnify, defend and hold harmless Contractor, its parent and affiliated companies and their respective directors, officers, employees, agents and subcontractors from and against any and all costs, liabilities, claims, demands and causes of action for pollution damages; contamination or adverse effects on the environment; destruction of, damage to, or loss of, whether actual or alleged, any property or natural resources, including the cost of assessing the damage; injury to or economic losses resulting from destruction of real or personal property; damages for loss of subsistence use of natural resources; damages equal to the loss of profits or impairment of earning capacity due to the injury, destruction or loss of real property, personal property or natural resources; damages for net costs of providing increased or additional public services; removal costs; and any other costs assessable under the Oil Pollution Act of 1990, the Comprehensive Environmental Response,

Compensation and Liability Act or other local, state or Federal law or lawful authority applicable to discharges or releases of oil or hazardous substances which Contractor, individually or collectively, may suffer, incur, or pay out in connection with, or arising out of, the release of oil or hazardous substances by Customer; provided, however, that the foregoing indemnity shall not apply to any claims, liabilities or causes of action caused by the transportation or disposal of waste materials by Contractor.

ARTICLE 9. Excuse of Performance

The performance of this Agreement, except for the payment of money for Services already rendered, may be suspended by either party in the event performance of this Agreement is prevented by a cause or causes beyond the reasonable control of such party. Such causes shall include but not be limited to: acts of God, acts of war, riot, fire, explosion, accidents, inclement weather, or sabotage; lack of adequate fuel, power, raw materials, labor or transportation facilities; changes in government laws, regulations, orders, or defense requirements; restraining orders, labor dispute, strike, lock-out or injunction (provided that neither party shall be required to settle a labor dispute against its own best judgements). The party which is prevented from performing by a cause beyond its reasonable control shall use its best efforts to eliminate such cause or event.

ARTICLE 10. Termination

This Agreement may be terminated by either party upon forty-eight (48) hours prior notice to the other party.

ARTICLE 11. Notice

Any notice to be given under this Agreement shall be in writing and delivered to the address listed below:

Customer:	Stingray Pipeline Company, L.L.C. 1100 Louisiana, Suite 3300 Houston, Texas 77002 Attn: John Locantro
Contractor:	Clean Harbors Environmental Services, Inc. 1501 Washington Street P.O. Box 859048 Braintree, Massachusetts 02185-9048 Attn: General Counsel (Urgent Contract Matter)

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives as of the day and year first above written.

STINGRAY PIPELINE COMPANY, L.L.C.

Signature: Allan M. Schneider

Printed Name: Allan M. Schneider

Title: Vice Chairman - Operations

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.

Signature: Hawk H. Hickman

Printed Name: HAWK H. HICKMAN

Title: E/R Contract mgr.



Environmental Services, Inc.

1501 Washington Street, Post Office Box 859048
Braintree, MA 02185-9048
Tel (781) 849-1800

Schedule of Emergency Response Labor, Equipment and Material Rates

Mr. Nat Griffith

Enbridge-Offshore (Gas Gathering), LLC

January 25, 2005

"People and Technology Protecting and Restoring America's Environment"

**Clean Harbors Environmental Services
Standard Materials Rates
Gulf Region**

PERSONAL PROTECTIVE EQUIPMENT

POLY COATED PROTECTIVE COVERALL		Day	Suit
Level D (Hard Hat, Boots, Gloves & PFD Work Vest)		\$ 40.00	
Kappler CPF I & CPF II or Equiv. - Level C			\$ 75.00
Kappler CPF III or Equiv. - Level B			\$ 400.00
Kappler CPF 5 Responder Level A Suit - Blue			\$ 990.00
Kappler CPF 5 Responder Plus Level A Suit - Orange			\$ 1,190.00
Aluminized Outer Garment			\$ 500.00
Barricade Suit			\$ 57.00
Chemrel Suit			\$ 45.00
Chemtuff Suit Level B			\$ 28.00
Chemtuff Suit Level C			\$ 24.00
Tyvec Polycoat Hd/Bt			\$ 25.00
Tyvec, Saranax			\$ 35.00
Tyvec, White			\$ 10.00
NFPA Spec Bunker Gear			\$ 250.00
Level A Intrinsically Safe, Hands Free Communications Package			\$100.00/day

Clean Harbors Environmental Services

Standard Materials Rates

Gulf Region

PERSONAL PROTECTIVE EQUIPMENT (cont.)

HAND PROTECTION

	Pair
Neoprene 14"	\$ 9.00
Nitrile 14"	\$ 10.00
12" PVC	\$ 8.00
18" PVC	\$ 9.00
Silver Shield	\$ 25.00
Cut Resistant	\$ 9.00
Latex Gloves (Box)	\$ 9.00
Cotton Winter Liners	\$ 3.00
Puncture Resistant	\$ 25.00

RESPIRATORY PROTECTION

	Per Pair
Acid Cartridge	\$ 20.00
Organic Vapor Cartridge (No Dust)	\$ 20.00
Chlorine Cartridge	\$ 20.00
Mercury Cartridge	\$ 40.00
Pesticide Cartridge	\$ 25.00
Asbestos	\$ 21.00
Organic Vapor/Dust	\$ 38.00
Ammonia Cartridge	\$ 24.00

FOOT PROTECTION

Disposable Boot Covers	\$ 10.00
Over / Slush Boot Daily Rental	\$ 9.00
Boots Chemical Resistant	\$ 35.00
Steel Toe Knee Boot Daily Rental	\$ 14.00
Steel Toe Hip Boot Daily Rental	\$ 16.25
Chest Waders	cost + 30%

HEAD / FACIAL PROTECTION

16 Oz. Eye Wash	\$ 14.00
Face / Splash Shield	\$ 7.25
Ear Plugs / Pr	\$ 1.00
Cold Weather Hard Hatliners	\$ 4.25
25 Person First Aid Kit	\$ 66.00

**Clean Harbors Environmental Services
Standard Materials Rates
Gulf Region**

DOT SHIPPING CONTAINERS

5 Gal Poly 1h2/Y1.5/60	\$	10.00
5 Gal Poly Closed 1h1/Y1.8/170	\$	16.50
5 Gal Steel 1a2/Y1.8/100	\$	13.00
5 Gal Steel Closed 1a1/Y1.8/300	\$	15.75
5.5 Gal Steel 1a2/Y23/S	\$	13.50
16 Gal Closed Poly 1h1/Y1.8/100	\$	29.50
16 Gal Poly 1h2/Y56/S	\$	45.00
30 Gal Poly 1h2/Y142/S	\$	61.50
30 Gal Poly Closed 1h1/Y1.8/100	\$	59.25
30 Gal Fiber 1g/X56/S	\$	24.00
30 Gal Steel Recon 1a2/Y1.2/100	\$	42.00
30 Gal Steel New 1a2/Y1.4/100	\$	87.00
30 Gal Steel Closed Recon 1a1/Y1.4/100	\$	33.00
30 Gal Steel Closed New 1a2/Y1.6/200	\$	74.00
55 Gal Poly 1h2/Y237/S	\$	100.00
55 Gal Poly Closed 1h1/Y1.8/150	\$	67.50
55 Gal Fiber 1g/Y190/S	\$	42.50
55 Gal Steel Closed Recon 1a1/Y1.4/100	\$	55.00
55 Gal Steel Closed New 1a1/Y1.8/300	\$	77.50
55 Gal Steel Recon 1a2/Y1.2/100	\$	55.00
55 Gal Steel New 1a2/Y1.5/100	\$	87.00
55 Gal Steel Hvy Gauge 1a2/1.5/100	\$	108.00
55 Gal Steel Poly Lined 6ha1/X1.5/280	\$	144.00
85 Gal Steel Recon 1a2/X400/S	\$	132.00
85 Gal Steel New 1a2/X400/S	\$	180.00
95 Gal Poly 1h2/Y318/S	\$	210.00
110 Gal Steel Recon 1a2/Y400s	\$	240.00
110 Gal Steel New 1a2/Y400s	\$	300.00
One Yard Flexbin 11g/Y/2022/1122	\$	125.00
Drum Liner W/ Lid	\$	19.50
4' Flourescent Tube Box 4g/Y275	\$	6.10
8' Flourescent Tube Box 4g/Y275	\$	7.50
18"x18"x24" Non Haz Path Box	\$	7.00
Pathological Waste Bag	\$	4.10
Plastic Bags (100/Roll) 6mil	\$	100.00
Plastic Bags Each	\$	2.00
Poly Sheet/Roll 20'x100' 6 Mil	\$	75.00
Roll-Off Liner	\$	65.00
Dump Trailer Liner	\$	80.00
Drum Rings/Bolts/Gaskets	\$	12.00
Shrink Wrap/Roll	\$	48.00

Clean Harbors Environmental Services

Standard Materials Rates

Gulf Region

ABSORBENT MATERIALS

20# Bag Sawdust	\$	5.50
Hg. Absorb/Lb.	\$	8.25
Oil Snare On 50' Line	\$	73.00
Oil Snare Loose In Bag/Box	\$	60.00
Absorbent Industrial Rug 36" X 300'	\$	275.00
Soda Ash (100 Lb)	\$	39.60
8" Absorbent Boom X 10' X 4' Bale	\$	150.00
5" Absorbent Boom X 10' X 4' Bale	\$	116.55
Sorbent Pad (101 Grade) /Bl	\$	60.00
Absorbent Pillow 14" X 25 Ea.	\$	15.00
Absorbent Pillows/Bale	\$	130.00
Absorbent Sweep 17" X 100'	\$	115.00
Speedi Dry	\$	25.00
Vermiculite 4 Cubic Ft.	\$	13.50
Rags 50# Box	\$	50.00
Absorbent Roll 38" X 144'	\$	140.00
Waterbond/Lb.	\$	10.00
Oilbond/Lb.	\$	12.00
Polysorbent/Bag	\$	60.00
Absorbent Corn Cob/Bag	\$	12.00
Absorbent Corn Cob/Pal	\$	300.00
Bio Degradable Absorbent/bag	\$	35.00
Fiberpearl/bag	\$	30.00
Chemical Absorbent Pads/bale	\$	70.00

DEGREASERS & NEUTRALIZING AGENTS

Capsur/Gal	\$	80.00
Liquid Alive /Gal	\$	69.54
Penetone Degreaser /Gal	\$	19.00
Pes 51 Cleaner /Gal	\$	46.00
Sea Clean Degreaser /Gal	\$	67.70
Citrus Cleaner/Gal	\$	50.00
Simple Green Degreaser/Gal	\$	12.50
Sanimite Cleaner/Gal	\$	12.00
Pink Stuff Degreaser/Gal	\$	12.00
Diesel Fuel (for Cleaning)	market price	
Trichloroethane / Gal	\$	4.20
No Flash /Gal	\$	18.94
Lime /50 Lb. Bag	\$	3.95
Soda Ash /100 Lb.	\$	39.60
Hydrochloric Acid/Lb.	\$	0.55
Citric Acid/Gal.	\$	3.80
Sodium Hypochlorite 15%/Gal.	\$	4.50
Spray Gel/Gal.	\$	19.80

Clean Harbors Environmental Services

Standard Materials Rates

Gulf Region

SAMPLING AND LAB SUPPLIES

Chlorn' Oil Test Kit 0-50 PPM	\$	14.00
Chlorn' Oil Test Kit 50-500 PPM	\$	14.00
Chlor D-Tech 4000 (Halogens)	\$	14.00
Hanby Soil Reagent/Sample	\$	45.00
Hanby Soil Analysis Kit / Day	\$	50.00
Sample Jar 4 Oz. W/Cover	\$	2.00
Sample Jar 12 Oz. W/Cover	\$	2.00
Sample Jar 16 Oz. W/Cover	\$	2.00
Sample Jar 32 Oz W/Cover	\$	3.00
Sampling Tube	\$	5.40
Disposable Bailer	\$	20.00
Ph Paper 1-14 / Roll	\$	10.00
Chemical Specific Detector Tubes		

Quoted individually

BUNA/VELLUMINOID MATERIALS

24" - 36" Manhole Gaskets	\$	60.00
2" Flange/Ring Gasket	\$	2.50
3" Flange/Ring Gasket	\$	4.00
4" Flange/Ring Gasket	\$	6.15
6" Flange/Ring Gasket	\$	10.00
8" Flange/Ring Gasket	\$	10.50
10" Flange/Ring Gasket	\$	14.40
12" Flange/Ring Gasket	\$	15.00
14" Flange/Ring Gasket	\$	17.50
16" Flange Ring Gasket	\$	18.35

MARINE EQUIPMENT

18# Anchor	\$	60.00
22# Anchor	\$	80.00
25# Anchor	\$	175.00
40# Anchor	\$	220.00
43# Anchor	\$	290.00
10" Inflatable Buoy	\$	30.00
13" Inflatable Buoy	\$	40.00
19" Inflatable Buoy	\$	60.00
6" Pick Up Buoy	\$	17.25
24" Safety Throw Ring	\$	105.00
1/4" Polypropylene Line/Roll	\$	75.00
3/8" Polypropylene Line/Roll	\$	75.00
1/2" Polypropylene Line/Roll	\$	100.00
3/4" Polypropylene Line/Roll	\$	175.00
3/8" Ungarded Galv. Chain/Ft	\$	4.60
1/2" Galv. Shackle/Screwpin	\$	7.25
1/2" Galv. Swivel / Eye&Eye	\$	28.50
Pfd Safety Light	\$	19.20
Signal Horn	\$	25.00
Pfd Work Vest	\$	66.25
Pfd Survival Suit	\$	800.00
Pfd Deck Suit	\$	100.00

Customer Initials SM

Clean Harbors Environmental Services
Standard Materials Rates
Gulf Region

Collection Jars for Mercury Vacuum	\$	30.00
Collection Bags for Mercury Vacuum	\$	19.00
Ice/5lb bag	\$	2.00
Drinking Water 16 oz	\$	1.50

Customer Initials JMS

Mar-02-05 08:14am From-Clean Harbors Kingston

781 585 9797

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F-345



Environmental Services, Inc.

1501 Washington Street, Post Office Box 859048
Braintree, MA 02185-9048
Tel (781) 849-1800

Schedule of Emergency Response Labor, Equipment and Material Rates

Stingray Pipeline Company

March 2, 2005

"People and Technology Protecting and Restoring America's Environment"

Clean Harbors Environmental Services

Standard Labor Rates

Gulf Region

Non Hazardous Spill Rate Schedule

FIELD PERSONNEL

	Hourly
Field Technician	\$ 33.00
Foreman	\$ 40.00
Supervisor	\$ 50.00
Equipment Operator	\$ 35.00
Project Manager	\$ 65.00
Sampling Technician	\$ 50.00
Chemist	\$ 65.00
Lead Chemist	\$ 85.00
Site Safety Officer	\$ 55.00

TECHNICAL PERSONNEL

	Hourly
Associate Engineer	\$ 65.00
Field Engineer/Scientist/Geologist	\$ 80.00
Sr. Engineer/Scientist/Geologist	\$ 90.00
Professional Engineer/LSP	\$ 110.00
Field Inspector	\$ 55.00
Senior Mechanical Technician	\$ 55.00
Drafter	\$ 58.00
Designer	\$ 65.00
Electrician	\$ 60.00
Mechanic	\$ 40.00
Sr. Mechanic	\$ 65.00
Plumber	\$ 61.00
Welder	\$ 60.00
Sr. Welder	\$ 65.00
Wastewater Treatment Operator	\$ 65.00

ADMINISTRATIVE/MANAGERIAL PERSONNEL

	Hourly
On site Administration	\$ 33.00
Coordinator	\$ 50.00
Commercial Trainer	\$ 75.00
General Manager	\$ 110.00

MAJOR EVENT "STRIKE TEAM"

	Hourly
Strike Team Leader	\$ 150.00
Operations Manager	\$ 110.00
Administration/Coordinator	\$ 90.00
Logistics/Procurement	\$ 70.00
	Per Person
Per Diem	\$ 150.00

Clean Harbors Environmental Services

Standard Labor Rates

Gulf Region

Hazardous Materials Rate Schedule

FIELD PERSONNEL

	Hourly
Field Technician	\$ 42.00
Foreman	\$ 49.00
Supervisor	\$ 66.00
Equipment Operator	\$ 50.00
Project Manager	\$ 70.00
Sampling Technician	\$ 50.00
Chemist	\$ 65.00
Lead Chemist	\$ 85.00
Site Safety Officer	\$ 75.00

TECHNICAL PERSONNEL

	Hourly
Associate Engineer	\$ 65.00
Field Engineer/Scientist/Geologist	\$ 80.00
Sr. Engineer/Scientist/Geologist	\$ 90.00
Professional Engineer/LSP	\$ 110.00
Field Inspector	\$ 55.00
Senior Mechanical Technician	\$ 55.00
Drafter	\$ 58.00
Designer	\$ 65.00
Electrician	\$ 60.00
Mechanic	\$ 50.00
Sr. Mechanic	\$ 65.00
Plumber	\$ 61.00
Welder	\$ 60.00
Sr. Welder	\$ 65.00
Wastewater Treatment Operator	\$ 65.00

ADMINISTRATIVE/MANAGERIAL PERSONNEL

	Hourly
On site Administration	\$ 35.00
Coordinator	\$ 55.00
Commercial Trainer	\$ 75.00
General Manager	\$ 110.00

MAJOR EVENT "STRIKE TEAM"

	Hourly
Strike Team Leader	\$ 150.00
Operations Manager	\$ 110.00
Administration/Coordinator	\$ 90.00
Logistics/Procurement	\$ 70.00
	Per Person
Per Diem	\$ 150.00

Mar-02-05 08:14am From-Clean Harbors Kingston

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Clean Harbors Environmental Services
Standard Equipment Rates
Gulf Region
PUMPING/TRANSFERRING

Pumps	Hourly	Daily
Drum Loader (air mover attachment)	\$	150.00
Pneumatic Drum Vac - Venturi	\$	150.00
3" Diesel Lister Pump	\$	135.00
2" Centrifical Pump	\$	95.00
3" Centrifical Pump	\$	110.00
4" Centrifical Pump	\$	135.00
1" Double Diaphragm Pump	\$	85.00
2" Double Diaphragm Pump	\$	120.00
3" Double Diaphragm Pump	\$	135.00
4" Double Diaphragm Pump	\$	185.00
2" Chemical Diaphragm Pump	\$	175.00
2" Parastolic Pump	\$	350.00
3" Chemical Diaphragm Pump	\$	175.00
Electric Drum Pump	\$	95.00
Hand Pump	\$	30.00
2" Hale Pump/Trash Pump	\$	100.00
3" Hale Pump/Trash Pump	\$	120.00
2" Electric Submersible Pump	\$	75.00
3" Electric Submersible Pump	\$	95.00
4" Electric Submersible Pump	\$	140.00
4" Hydraulic Transfer Pump	\$ 165.00	
6" Hydraulic Transfer Pump	\$ 220.00	
8" Hydraulic Transfer Pump	\$ 275.00	
6" Hydraulic Sludge Pump with Power Pack		\$500.00

Transporters	Hourly	Daily
Vacuum Tractor Trailer w/Operator (130 bbl)	\$ 88.00	
Tractor W/Liquid Transporter w/Operator	\$ 83.00	
High Power Vacuum Truck/Cusco w/Operator	\$ 118.00	
High Power Vacuum Truck/Cusco W/Liquid Ring w/Operator	\$ 128.00	
15 Gal HEPA Filter		\$ 150.00
Vacuum Truck w/Operator (80 bbl)	\$ 65.00	
Skid Mount Vacuum System		\$ 300.00
Air Mover w/Operator	\$ 150.00	
Air Mover w/Operator & Cyclopedia	\$ 150.00	
Air Mover w/Operator & HEPA	\$ 150.00	
Air Mover w/Operator & High Rail	\$ 150.00	
Air Mover Flex Hose 4" (100ft Roll)		\$ 75.00/Roll
Air Mover Hose 6" (100ft Roll)		\$155.00/Roll

***Decontamination of Vacuum Trucks, Vactors, Cuscos, Trailers, etc. not included.
 Some may require personnel entry, some may be deconned at a local truck wash at cost + 20%

Customer Initials _____

Clean Harbors Environmental Services

Standard Equipment Rates

Gulf Region

PUMPING/TRANSFERRING (continued)

Hoses

	Daily
2" Cross Link Poly-Chem Hose (25')	\$ 37.50
2" Lay Flat Hose (25')	\$ 25.00
2" Oil Suction Hose (25')	\$ 25.00
2" Fire Hose (50')	\$ 50.00
3" Cross Link Poly Chem Hose (25')	\$ 43.75
3" Oil Suction Hose (25')	\$ 37.50
3" Lay Flat Hose (25')	\$ 37.50
3/4" Air compressor hose/foot	\$ 1.00
4" Lay Flat Hose (25')	\$ 50.00
4" Cross Link Poly Chem Hose (25')	\$ 56.25
4" Oil Suction Hose (25')	\$ 50.00
5/8" Wash Hose (50')	\$ 12.50
6" Lay Flat Hose (25')	\$ 67.50
6" Oil Suction Hose (25')	\$ 75.00

EARTH MOVING EQUIPMENT

	Hourly	Daily
Backhoe Loader - 1 Yard Bucket	\$ 56.00	
Bobcat Loader	\$ 50.00	
Attachment For Bobcat		\$ 110.00
Excavator - Track	\$ 86.00	
Loader - 3 Yard Bucket	\$ 66.00	
Dump Truck (10 Whl)	\$ 41.00	
Tractor W/Bulk Hopper	\$ 51.00	
Tractor W/Dump Trailer	\$ 51.00	
Tractor W/Roll-Off Trailer	\$ 51.00	
Wheel Barrow		\$ 20.00
Hand tool package		\$ 25.00

SITE SUPPORT

Carbon Filter System	\$ 215.00	
Incident Command Unit	\$ 1,000.00	
Air Compressor 175 CFM	\$ 220.00	
Air Compressor 375 CFM	\$ 300.00	
Air Compressor 10 CFM	\$ 110.00	
Eyewash Station	\$ 30.00	
20,000 Gal. Frac Tank		\$ 75.00
Secondary Containment	\$ 36.00	\$ 152.00
Generator (5K)	\$ 75.00	
Generator (8K)	\$ 100.00	
Generator (12K)	\$ 150.00	
150,000 BTU Portable Heater	\$ 200.00	
Intrinsically Safe Drop Light	\$ 75.00	
Light Stand	\$ 75.00	
Light Tower w/Generator	\$ 150.00	
Drum Scale (Portable)	\$ 50.00	

Customer Initials _____

Mar-02-05 08:15am From-Clean Harbors Kingston

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Clean Harbors Environmental Services Standard Equipment Rates Gulf Region

SITE SUPPORT (continued)

	Daily	Weekly
Truck Scale (Portable)	\$ 250.00	
Roll-Off Container	\$ 25.00	
Intermodal Container	\$ 28.00	
Vacuum Tight Container	\$ 50.00	
2,000 Gal Poly Storage Tank	\$ 61.00	
4,000 Gal Poly Storage Tank	\$ 85.00	
Decontamination Trailer	\$ 225.00	
Tank Trailer, No Tractor (For On-site Storage Only)	\$ 400.00	
Van Trailer, No Tractor (For On-site Storage Only)	\$ 175.00	
ATV 4x4 or 4x6	\$ 300.00	
Canaflex Bags, SeaSlugs - 250 gallon	\$ 350.00	
Canaflex Bags, SeaSlugs - 1250 gallon	\$ 250.00	
Hudson Sprayer	\$ 25.00	
Decon Pool 25' x 50'	\$ 200.00	
Decon Pool 20' x 100'	\$ 400.00	
Decon Pool 10' x 10'	\$ 125.00	
Chains & Binders	\$ 20.00	
Scare Gun	\$ 40.00	
Shrink Wrap Applicator Tool	\$ 10.00	
Personell Staging Tent 20' x 30'	\$ 150.00	
Intrinsically Safe Tool Kit	\$ 25.00	

** Spotting fee, Liners, Cleaning of Unit not included.

RESPIRATORY PROTECTION

	Daily	Weekly
2 Man Breathing System	\$ 240.00	
4 Man Breathing System	\$ 300.00	
6 Man Breathing System	\$ 340.00	
Air Breathing Machine	\$ 500.00	
Self Contained Breathing App. 30 min	\$ 175.00	
Self Contained Breathing App. 60 min	\$ 225.00	
5 Minute Escape Pack	\$ 150.00	
Respirator, Full Face	\$ 35.00	
Respirator, Half Face	\$ 20.00	
3/8" Breathing Air Hose/100 FT	\$ 50.00	
Negative Air Machine	\$ 200.00	\$ 600.00

Customer Initials _____

Mar-02-05 08:15am From-Clean Harbors Kingston

781 585 9787

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Clean Harbors Environmental Services
Standard Equipment Rates
Gulf Region
FIELD ANALYTICAL

	Daily
4 Gas Meter	\$ 250.00
Hydrogen Cyanide Meter	\$ 110.00
Hydrogen Sulfide (H2S) Meter	\$ 50.00
Draeger Air Monitor Pump	\$ 50.00
Explosion/Oxygen Meter	\$ 110.00
Geiger Counter	\$ 110.00
PID Meter	\$ 110.00
Interface Probe	\$ 110.00
Mercury Vapor Analyzer	\$ 180.00
Organic Vapor Analyzer (OVA)	\$ 140.00
Organic Vapor Analyzer (FID)	\$ 350.00
Conductivity Meter	\$ 110.00
Ultrasound Meter	\$ 250.00
Hydrostatic Tester	\$ 100.00
Personal Air Pump	\$ 55.00
pH Meter	\$ 50.00
Bailer & Sampling Equipment	\$ 50.00
Well purging/Sampling Pump	\$ 50.00
Noise Dosimeter	\$ 50.00

LIGHT DUTY TRUCK/RESPONSE EQUIPMENT

	Hourly	Daily
1/2 - 3/4 Ton Pickup or Car	\$	100.00
Stake Body/Utility Truck	\$	150.00
1 Ton Pickup 2 whl & 4 whl Drive	\$	150.00
Sport Utility Vehicle	\$	150.00
2 1/2 Ton Utility Vehicle	\$	175.00
HAZMAT Response Trailer	\$	450.00
Spill Trailer	\$	300.00
Utility/Boom Trailer	\$	75.00

MILEAGE FEES: Mileage fees of \$0.75 per mile will be charged when applicable

FUEL FEES: Fuel will be charged @ \$1.85/gallon. Fuel is both diesel and gasoline

HEAVY DUTY TRUCKS

	Hourly	Daily
Box Truck (10 Wheel) w/Operator	\$ 80.00	
Box Truck (6 Wheel) w/Operator	\$ 75.00	
Rolloff Truck (10 Wheel) w/Operator	\$ 80.00	
Flatbed Trailer 40'		\$ 150.00
Lowboy Trailer 40'		\$ 100.00
Tractor - Trailer not included w/Operator	\$ 73.00	
Tractor W/Box Van w/Operator	\$ 83.00	

Customer Initials _____

Mar-02-05 08:15am From=Clean Harbors Kingston

781 585 9797

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Clean Harbors Environmental Services

Standard Equipment Rates

Gulf Region SPECIALTY EQUIPMENT

	Hourly	Daily
Electric Blower		\$ 75.00
Pneumatic Fan Blower		\$ 75.00
Jet Air Blower		\$ 55.00
Soil Vent Blower		\$ 150.00
Drum Crusher - Portable	\$ 50.00	\$ 200.00
Pneumatic Remote Drum Opener (penetration)		\$ 1,000.00
Hydraulic Shears		\$ 175.00
Personnel Extracting Device		\$ 125.00
Confined Space Entry Gear		\$ 320.00
Forklift (2000 Lb. Capacity)		\$ 320.00
Forklift W/Drum Grabber		\$ 350.00
Forklift W/Drum Tilter		\$ 350.00
Acetylene Cutting Torch		\$ 100.00
Plasma Cutting Torch		\$ 200.00
Welding Machine		\$ 100.00
Sandblaster & Hose		\$ 150.00
Electric Scarifier		\$ 200.00
Compactor		\$ 55.00
Auger - Manual		\$ 55.00
Transit Set		\$ 100.00
Drum Dolly		\$ 20.00

PRESSURE WASHING EQUIPMENT

	Hourly	Daily
Water Blaster - 10,000 PSI	\$ 75.00	
Water Blaster - 20,000 PSI	\$ 100.00	
1000 PSI Pressure Washer		\$ 85.00
2000 PSI Pressure Washer		\$ 95.00
2500 PSI Pressure Washer		\$ 100.00
2500 PSI Hot Pressure Washer		\$ 300.00
3000 PSI Hot Pressure Washer		\$ 330.00
3500 PSI Hot Pressure Washer		\$ 350.00

MARINE RESPONSE EQUIPMENT

	Hourly	Daily
Power Workboat (12' - 17')		\$ 225.00
Power Workboat (18'-22')		\$ 425.00
20' Fast Response Vessel w/o use of Storage		\$ 550.00
20' Fast Response Vessel with use of Storage (30 bbl)		\$ 800.00
Power Workboat (23'-30')		\$ 750.00
Air Boat		\$ 560.00
Pirogue		\$ 35.00
Power Boat (>30')		case-by-case
Jon Boat		\$ 100.00
Global Positioning System		\$ 50.00
PFD Survival Vest		\$ 20.00
PFD Survival Suit		\$ 65.00

Customer Initials _____

Mar-02-05 08:15am From-Clean Harbors Kingston

781 585 9797

T-475 P.010/022 F-345

Clean Harbors Environmental Services

Standard Equipment Rates

Gulf Region

MARINE RESPONSE EQUIPMENT (cont.)

	Hourly	Daily
Duck Bill Skimmer		\$ 25.00
Skim Pack		\$ 150.00
Drum Skimmer (small - 24")		\$ 300.00
Drum Skimmer (medium - 36")		\$ 350.00
Drum Skimmer (large - 48")		\$ 400.00
Weir Disc Skimmer Unit		\$ 350.00
Oil Coralling Spray Bar		\$ 25.00
VHF Marine Radio		\$ 50.00
Hydraulic Drive Unit	\$ 75.00	
Inflatable Buoy		\$ 30.00
10" Containment Boom		\$ 1.25/FT
18" Containment Boom		\$ 1.50/FT
24" Containment Boom		\$ 3.00/FT
36" Containment Boom		\$ 4.25/FT
48" Containment Boom		\$ 6.00/FT
Boom Anchor System		\$ 25.00
Boom Lights		\$ 25.00
Marco Harbor 28' Fast Response Recovery Vessel		\$ 5,000.00
Marco SideWinder		\$ 4,700.00
Marco Skimmer belt-light oil pads (Set of 4)	\$ 700.00	Each
MarcoSkimmerBelt Drive	\$ 1,200.00	Each
Containment Boom Tow Bridle		\$ 25.00

* Cost of Decontamination of Marine Response Equipment not included.

PNEUMATIC POWER TOOLS

	Daily
1/2" Drive Drill	\$ 55.00
3/8" Drive Drill	\$ 30.00
3/4" Rotary Hammer Drill	\$ 80.00
Jackhammer 40 Lb.	\$ 55.00
Jackhammer 60 Lb.	\$ 70.00
Jackhammer 90 Lb.	\$ 85.00
Pneumatic Chipping Gun	\$ 55.00
Steel Nibbler	\$ 105.00
Reciprocating Saw	\$ 90.00

ELECTRIC POWER TOOLS

	Daily
1/2" Drill	\$ 38.00
3/8" Drill	\$ 30.00
60# Jackhammer	\$ 80.00
Circular Saw	\$ 50.00
Recipricating Saw	\$ 50.00
Shop (Wet) Vac	\$ 35.00
Mercury Vacuum	\$ 180.00

Customer Initials _____

Clean Harbors Environmental Services

Standard Analytical Rates

Gulf Region

ORGANIC ANALYSES

	Each
Volatile Organics - EPA method 624/8260	\$ 180.00
Base/Neutral & Acid Extractables - EPA method 625/8270	\$ 400.00
Base/Neutral Extractables - EPA method 625/8270	\$ 270.00
Acid Extractables - EPA method 625/8270	\$ 235.00
Polychlorinated Dioxins/Furans - EPA method 8280	\$ 1,665.00
Library Search GC/MS	
VOA (10 substances of greatest apparent concentration)	\$ 60.00
BNA (20 substances of greatest apparent concentration)	\$ 80.00
Halogenated Volatile Organics - EPA method 601/8010	\$ 110.00
Aromatic Volatile Organics - EPA method 602/8020	\$ 100.00
Organochlorine Pesticides & PCB - EPA method 608/8080	\$ 185.00
Organochlorine Pesticides - EPA method 608/8080	\$ 145.00
PCBs, Water or Solid - EPA method 608/8080	\$ 110.00
PCBs, Oil - EPA method 600/4-81-045	\$ 95.00
PCBs, Wipe - EPA method 8080	\$ 95.00
Organophosphorous Pesticides - EPA method 8140	\$ 320.00
Chlorinated Herbicides	\$ 240.00
Polynuclear Aromatic Hydrocarbons by HPLC - EPA method 8310	\$ 290.00
Total Petroleum Hydrocarbons as Gasoline - EPA method 8015	\$ 90.00
Total Petroleum Hydrocarbons as Diesel - EPA method 8015	\$ 100.00
Hydrocarbon Identification & Quantification - EPA method 8100	\$ 150.00
Volatile Petroleum Hydrocarbon, Deluxe - MA DEP VPH	\$ 140.00
Volatile Petroleum Hydrocarbon, Standard - MA DEP VPH	\$ 100.00
Extractable Petroleum Hydrocarbon, Deluxe - MA DEP EPH	\$ 280.00
Extractable Petroleum Hydrocarbon, Standard - MA DEP EPH	\$ 175.00

TRACE METALS ANALYSES

Individual Metals By:	
Direct Aspiration (Flame (AA) or ICP) - EPA Series 200/7000	\$ 15.00
Graphite Furnace - EPA Series 200/7000	\$ 25.00
Mercury - Cold Vapor - EPA Methods 245.1/7470/7471	\$ 40.00
Chromium Hexavalent - SM3500-Cr D/7196	\$ 40.00

INORGANIC ANALYSES

Acidity - EPA method 305.1	\$ 20.00
Alkalinity - EPA method 310.1	\$ 20.00
Ash Content - ASTM D482-80	\$ 40.00
Biochemical Oxygen Demand - EPA method 405.1	\$ 40.00
Bromide - EPA method 320.1	\$ 40.00
Btu (Heating Value) - ASTM D240-76	\$ 125.00
Chemical Oxygen Demand - EPA method 410	\$ 30.00
Chloride - EPA method 325.3	\$ 20.00

Customer Initials _____

Clean Harbors Environmental Services Standard Analytical Rates Gulf Region

INORGANIC ANALYSES (cont)

Chlorine, Total - EPA method 330.5	\$	25.00
Chlorine, Residual - SM 4500 Cl G	\$	20.00
Cyanide, Total - EPA methods 335.2/9010	\$	40.00
Cyanide, Amenable to Chlorination - EPA methods 335.1/9010	\$	55.00
Cyanide, Reactive - EPA method 7.3.3.2	\$	45.00
Flashpoint - EPA method 1010/ASTM D1310-84	\$	35.00
Fluoride - EPA method 340.1	\$	25.00
Halogens, Total - ASTM Methods D808/D512	\$	130.00
Hardness - EPA method 130.2	\$	20.00
Nitrogen, Ammonia - EPA method 350.2	\$	30.00
Nitrogen, Kjeldahl - EPA method 351.3	\$	40.00
Nitrogen, Nitrate - EPA method 352.1	\$	30.00
Nitrogen, Nitrate & Nitrite - EPA method 353.2/352.1/354.1	\$	30.00
Nitrogen, Nitrite - EPA method 354.1	\$	25.00
Nitrogen, Organic - EPA methods 351.3/350.2	\$	55.00
Oil & Grease, Gravimetric, Total - EPA methods 413.1/9070	\$	55.00
Oil & Grease, Gravimetric, Petroleum Hydrocarbon - SM 5520F	\$	75.00
Oil & Grease, Infrared (IR), Total - SM 5520F	\$	70.00
Oil & Grease, Infrared (IR), Total Petroleum Hydrocarbon -EPA Method 418.2	\$	75.00
OIL & Grease, Infrared (IR), Total & Petroleum Hydrocarbon -SM5520F	\$	80.00
Paint Filter Test - EPA method 9095	\$	25.00
pH - EPA methods 150.1/9040/9045	\$	15.00
Phenols, Total - EPA methods 420.1/9065	\$	40.00
Phosphorous, Total - EPA method 365.2	\$	40.00
Phosphorous, Orthophosphate - EPA method 365.2	\$	30.00
Sieve Test - ASTM D422-63	\$	185.00
Solids, Total - EPA method 160.3/SM 2540G	\$	15.00
Solids, Total Dissolved - EPA method 160.1	\$	20.00
Solids, Total Suspended - EPA method 160.2	\$	15.00
Solids, Settleable - EPA method 160.5	\$	15.00
Solids, Total Volatile - EPA method 160.4	\$	20.00
Specific Conductance - EPA method 120.1	\$	15.00
Specific Gravity - ASTM D1429-76	\$	45.00
Sulfate - EPA method 375.4/9036	\$	25.00
Sulfide, Total - EPA method 376.1/9030	\$	30.00
Sulfide, Reactive - EPA method 7.3.4.2	\$	50.00
Sulfite - EPA method 377.1	\$	25.00
Sulfur - ASTM D129-64	\$	90.00
Surfactants - EPA method 425.1	\$	75.00
Total Organic Carbon - EPA methods 415.1/9060	\$	65.00
Turbidity - EPA method 180.1	\$	15.00
Viscosity - ASTM D455-88	\$	105.00

Clean Harbors Environmental Services Standard Analytical Rates Gulf Region

ENVIRONMENTAL PACKAGES

Toxicity Characteristic Leaching Procedure

Extraction for Metals, Base/Neutral & Acid Extractables, Pesticides and Herbicides - EPA method 1311	\$ 80.00
Zero Headspace Extraction - EPA method 1311	\$ 105.00
Volatile Organics - EPA method 8260	\$ 185.00
Base/Neutral & Acid Extractable Organics - EPA method 8270	\$ 405.00
Organochlorine Pesticides - EPA method 8080	\$ 155.00
Chlorinated Herbicides - EPA method 8150	\$ 215.00
Metals - EPA 7000 Series	\$ 150.00
Full TCLP Analysis	\$ 1,295.00

Appendix IX Analyses

Volatile Organics - EPA method 8260	\$ 310.00
Base/Neutral & Acid Extractable Organics - EPA method 8270	\$ 645.00
Organochlorine Pesticides - EPA method 8080	\$ 280.00
Organophosphorous Pesticides - EPA method 8140	\$ 320.00
Chlorinated Herbicides - EPA method 8150	\$ 320.00
Polychlorinated Dioxins/Furans - EPA method 8280	\$ 1,665.00
Metals - EPA 7000 Series	\$ 330.00
Cyanide - EPA method 9010	\$ 40.00
Sulfide - EPA method 9030	\$ 40.00

SURCHARGE SCHEDULE

24 hours	100%
48 hours	75%
72 hours	50%
96 hours	35%

WASTE MATERIAL APPROVAL

Profile Approval Fee (no sample required per permit)	\$ 60.00
Profile Approval Fee & Sample Fingerprinting*	\$ 100.00
Profile Approval Fee & Sample Treatability*	\$ 150.00

*Plus Shipping

Customer Initials _____

Notes for the Clean Harbors Environmental Services, Inc., Schedule of Rates

1. All items supplied by CHESI including ~~equipment~~ **Gulf Region** inventoried and warehoused by CHESI for which rates appear in the Schedule of Rates will be charged at the corresponding rates. For all equipment, materials, services and other applicable fees not described in the Schedule of Rates which are obtained by CHESI from subcontractors or suppliers for specific projects, the customer shall reimburse CHESI for its cost plus a handling charge of thirty percent (30%) of such cost. (Unless otherwise specified, these rates are not valid for responses to Infectious agents/Biologicals)
2. Lodging and subsistence of CHESI billable personnel are included in a per diem charge of \$150.00 per person per day. CHESI per diem rates are charged for subcontractors whose expenses are paid by CHESI (applies to work 50 miles or more away from our operation center).
3. In the event the nature of the work, in CHESI's sole discretion, requires the use of Level A, B, C, or D personal protection and safety equipment, CHESI shall use personal protection and safety equipment and the client shall reimburse CHESI the additional cost(s) in accordance with the Schedule of Rates.
4. The Schedule of Rates includes the cost of CHESI basic medical monitoring program. Any special medical monitoring required by the client or the nature of the work will be added to the project scope and the client shall reimburse CHESI at its cost plus 30%.
5. All personnel and equipment will be charged portal-to-portal (mobilization and demobilization included). Services provided prior, during and/or subsequent to actual project site activities will also be charged.
6. The normal employee workday is 7:00 a.m. to 3:30 p.m. Monday through Friday. Other work hours must be agreed upon in writing in advance for straight-time rates to apply. Time taken by personnel to decontaminate and re-don protective clothing and equipment is billed as part of the work.
7. Straight-time hours for billable personnel are based on an eight hour per day work period. This work period must be within the 7:00a.m. to 3:30p.m. time frame unless other hours have been agreed to in writing.
8. Time over eight (8) hours in the normal workday as described above, all hours outside of said normal workday and all day Saturday is considered overtime and will be billed at 1.5 times the applicable straight time rate for all billable personnel.
9. Sunday and Holidays are considered premium time and will be billed at 2.0 times the applicable straight time rate for all billable personnel.
10. All emergency call-outs (i.e., less than 24-hour notice) will be subject to a minimum four (4) hour response charge or \$1500.00 minimum charge, whichever is greater. Minimum charges do not include Transportation and Disposal.
11. Cellular phone charge of \$50.00 shall be charged for emergency response jobs. For long-term cleanups, a charge of cost plus thirty percent (30%) will apply.
12. Charges for Safety Plans are assessed on all Emergency Response projects, or those involving OSHA regulated substances. Site Specific Health & Safety Plans prepared for the customer, or as required by applicable regulations, will be quoted on an individual basis.
13. Based on the national average price of diesel, a Fuel Oil Surcharge may apply. Invoices will show the surcharge as a separate line item. The surcharge will not apply to sales tax.



MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA DIAMOND *
Gas Control (888) 650-8099 CHEMTREC Assistance (800) 424-9300	Phone (713) 650-8900 Fax (713) 821-2080	4 - Extreme 3 - High 2 - Moderate 1 - Slight 0 - Insignificant * - See text
MSDS NUMBER 1007		

MANUFACTURER/SUPPLIER: **Enbridge, (U.S.), Inc.**
1100 Louisiana Street, Suite 3300
Houston, Texas 77002

1. PRODUCT IDENTIFICATION

NATURAL GAS CONDENSATE

Product Name	Natural Gas Condensate
Synonym/Product Name:	Drip Gas, Condensate, Pipeline Liquids, Field Condensate
Chemical Family:	Petroleum Hydrocarbon
Molecular Formula:	Mix of heavy hydrocarbons
Molecular Weight:	Varies

2. PRODUCT HAZARD SUMMARY

Health: Cancer hazard. Overexposure may cause damage to the peripheral nervous system. Use ventilation adequate to keep exposures below recommended limits. Avoid breathing vapor or mist. Avoid contact with eyes, skin or clothing. Do not taste or swallow. Wash thoroughly after handling.
 HMIS Classification for Health: 1

Flammability: Flammable liquid and vapor. Keep away from heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, mechanical/electrical equipment).
 HMIS Classification for Flammability: 4

Reactivity: Stable under normal conditions. Avoid all sources of ignition.
HMIS Classification for Reactivity: 0

3. PRODUCT HEALTH HAZARD INFORMATION

Ingestion: Low to moderate degree of toxicity by ingestion. Major health threat occurs from danger of breathing (aspiration) liquid drops into lungs, especially during vomiting. Ingestion may cause nausea, vomiting, diarrhea and central nervous system effects similar to alcohol intoxication.

Skin: Prolonged contact may cause mild skin irritation including redness, burning and drying and cracking of the skin. No harmful effects from skin absorption are expected.

Eye: Contact may cause mild eye irritation, including stinging, watering, redness and swelling.

Inhalation: Low to moderate degree of toxicity by inhalation. Prolonged or excessive exposure may cause irritation to the nose, throat, lungs and respiratory tract.

Signs and Symptoms: Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, diarrhea, transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination and fatigue).

Cancer: A component (benzene) is a known human cancer hazard (see Special Toxic Effects below). Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure.

Target Organs: Overexposure to a component (toluene) may cause injury to the peripheral nervous system. There is limited evidence from animal studies that overexposure may cause injury to the male reproductive system.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin, respiratory (asthma-like), male reproductive and peripheral nerve disorders. Exposure to high concentrations of this material may increase the sensitivity of the heart to certain drugs. Persons with pre-existing heart disorders may be more susceptible to this effect.

Special Toxic Effects:**n-Hexane (CAS 110-54-3)**

Target Organs – Excess exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesia of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone. Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Toluene (CAS 108-88-3)

Target Organs – Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system damage in lab animals.

Developmental – Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in lab animals.

Benzene (CAS 71-43-2)

Carcinogenicity: Benzene is a known animal carcinogen and is known to produce leukemia in humans. Benzene has been identified as a human carcinogen by NTP, IARC and OSHA.

4. FIRST AID

Ingestion: Aspiration hazard. Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe damage. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration.

Skin Contact: Wipe material from skin and remove contaminated clothing. Cleanse affected areas thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. If irritation or redness develops, seek medical attention.

Eye Contact: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water for 15 minutes, with eyelids held open. If symptoms persist, seek medical attention.

Inhalation: If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, qualified personnel should administer oxygen. Seek immediate medical attention.

Notes to Physician: Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of this material (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for development of cardiac arrhythmias.

5. PERSONAL PROTECTION INFORMATION

Eye Protection: Safety glasses or goggles are recommended when there is a possibility of splashing or spraying.

Skin Protection: The use of gloves (nitrile or neoprene) is advised to prevent skin contact and possible irritation. Depending on conditions, the use of an apron or chemical protective clothing may be necessary.

Respiratory Protection: A NIOSH certified air purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations of hydrocarbons are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is a potential for an uncontrolled release, exposure levels are not known or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed when workplace conditions warrant a respirator's use.

Engineering Controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

6. PHYSICAL PROPERTIES

Boiling Point:	100-1000°F
Specific Gravity:	0.6 - 0.75 @ 39.2°F (Water = 1)
Freezing/Melting Point:	ND
% Volatile:	Approximately 100%
Vapor Pressure:	ND
Vapor Density (Air = 1):	>1

ND = No Data

NA = Not Applicable

MSDS NO: 1007
Natural Gas Condensate

Viscosity	ND
% Solubility in Water:	0%
Density (lb/gal)	Varies, but estimated at 6 lb/gal
Physical State:	Liquid
pH:	ND
Appearance:	Clear to dark amber in color
Odor:	Petroleum smell

7. FIRE AND EXPLOSION DATA

Flash Point	<20°F
Autoignition Temperature:	ND
Flammability Limits In Air (% By Vol.) Lower:	Varies, est. 1.0%
Flammability Limits In Air (% By Vol.) Upper:	Varies, est. 7.0%

Basic Fire Fighting Procedures: Long-duration fires involving natural gas condensate stored in tanks may result in a boilover. The contents of the tank may be expelled beyond the containment dikes or ditches. All personnel should be kept back a safe distance when a boilover is anticipated (reference NFPA 11). For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces or when explicitly required by DOT, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant. Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

Extinguishing Media: Any extinguisher capable of handling Class B fires is recommended, including extinguishing media such as CO₂, dry chemical or foam. Water spray is recommended to cool or protect exposed materials or structures. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Unusual Fire and Explosion Hazards: This material is flammable and may be ignited by heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, or mechanical/electrical equipment). Vapors may travel considerable distances to a source of ignition where they can ignite, flashback or explode. May create vapor/air explosion hazard indoors, outdoors or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

8. REACTIVITY DATA

Stability/Incompatibility: Stable under normal conditions of storage and handling. Flammable liquid and vapor. Vapor can cause flash fire.

Avoid contact with strong oxidizing agents.

Hazardous Reaction/Decomposition Products: Combustion can yield carbon dioxide, carbon monoxide, other organic compounds and non-combusted hydrocarbons.

9. ENVIRONMENTAL INFORMATION

Spill or Release to the Environment: Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of spill/release, isolate immediate hazard area and keep unauthorized personnel out. Product may release large amounts of flammable vapors (e.g., methane, ethane and propane) at or below ambient temperature depending on source and process conditions. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory equipment as conditions warrant. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems and natural waterways. Dike far ahead of spill for later recovery or disposal. Use foam on spills to minimize vapors. Spilled material may be absorbed into an appropriate absorbent material.

Notify fire authorities and appropriate federal, state and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount into navigable waters, notify the National Response Center (800-424-8802).

Notification: Notify fire authorities and appropriate federal, state and local agencies.

Waste Disposal: Consult federal, state and local waste regulations to determine appropriate disposal options.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

Sara Title III Information: This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Toluene	CAS – 108-88-3	Weight % - <2.0
n-Hexane	CAS – 110-54-3	Weight % - up to 10%
Benzene	CAS – 71-43-2	Weight % - 0 – 0.3

10. REGULATORY INFORMATION

EPA Reportable Quantity: The estimated reportable quantity (RQ) for this material is based on the weight % shown below:

RQ based on benzene – The RQ for benzene is 10 pounds, which equals 3,333 pounds of natural gas condensate (556 gallons). The RQ is based on 0.3 wt. % benzene.

RQ based on n-Hexane – The RQ for n-Hexane is 5000 pounds, which equals 50,000 pounds of natural gas condensate (8,333 gallons). The RQ is based on 10 wt. % n-Hexane.

RQ based on toluene – The RQ for toluene is 1000 pounds, which equals 50,000 pounds of natural gas condensate (8,333 gallons). The RQ is based on 2 wt. % toluene.

11. SPECIAL PRECAUTIONS / SUPPLEMENTAL INFORMATION

Handling/Storage: The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits. Use good personal hygiene practice.

Keep containers tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces and all sources of ignition. Post area "No Smoking or Open Flame". Store only in approved containers. Keep away from any incompatible material. Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

Depending on the source of natural gas condensate, there could be some amount of NORM (naturally occurring radioactive materials) in the scale, deposit and sludge associated with this material. Proper measurements should be taken prior to handling this material or any equipment contaminated with this material. If NORM is indicated, refer to API Bulletin E2, "Bulletin on Management of Naturally Occurring Radioactive Materials in Oil and Gas Production," for additional information.

Empty Containers: "Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1 and other governmental and industrial references pertaining to cleaning, repairing, welding or other contemplated operations.

12. TRANSPORTATION REQUIREMENTS

General Transportation Information:

DOT Proper Shipping Name (49 CFR 172.101):	Petroleum Products, n.o.s. (condensate)
DOT Hazard Classes (49 CFR 172.101):	3
UN/NA Code (49 CFR 172.101):	UN1268
Packing Group (49 CFR 172.101):	NA
Bill of Lading Description (49 CFR 172.202):	Petroleum Products, n.o.s. (condensate)
DOT Labels Required (49 CFR 172.101):	Flammable Liquid

Please note that the actual shipping name and associated data can vary due to the properties of the product. Other acceptable shipping names may include Petroleum Crude Oil 1267, Petroleum Distillate n.o.s. 1268, Gasoline UN1203, Flammable liquids, n.o.s. (pentane) UN1993 or Hydrocarbons, Liquid n.o.s. (condensate) UN3295.

13. INGREDIENTS/HEALTH HAZARD INFORMATION

Component	CAS NO.	Typical %* by weight	EXPOSURE GUIDELINE	
			PPM	Agency - Type
Natural Gas Condensate	68919-39-1	100	500	OSHA -TWA
Pentane	109-66-0	30-70	600 1000 500	ACGIH – TWA OSHA – TWA MSHA - TWA
n-Hexane	110-54-3	0-10	50 500	ACGIH – TWA (skin) OSHA – TWA
Toluene	108-88-3	0-2	50 200 300 100	ACGIH – TWA (skin) OSHA – TWA OSHA – CEIL MSHA - TWA
Benzene	71-43-2	0 – 0.3	0.5 2.5 1 5 25	ACGIH – TWA, Skin ACGIH – STEL, Skin OSHA – TWA OSHA – STEL MSHA – CEIL, Skin
Note that state, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information				

* Values do not reflect absolute minimums and maximums; those values may vary from time to time.

REVISION DATE: 07/28/08

REPLACES SHEET DATED: NA

COMPLETED BY: Enbridge (US) Inc. EHS Department

NOTE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet (MSDS). However, MSDS's may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices or from any hazards inherent in the nature of the product.

ND = No Data

NA = Not Applicable

MSDS NO: 1007
Natural Gas Condensate



MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA DIAMOND *
Gas Control (888) 650-8099 CHEMTREC Assistance (800) 424-9300	Phone (713) 650-8900 Fax (713) 821-2080	
MSDS NUMBER 1001		

MANUFACTURER/SUPPLIER: **Enbridge, (U.S.), Inc.**
 1100 Louisiana Street, Suite 3300
 Houston, Texas 77002

1. PRODUCT IDENTIFICATION

Name:

SWEET NATURAL GAS (RESIDUE)

CAS NUMBER: 74-82-8
Synonym/Product Name: Residue Gas
Chemical Family: Aliphatic Hydrocarbon
Molecular Formula: CH₄
Molecular Weight: 16

2. PRODUCT HAZARD SUMMARY

Health:

Warning!

Asphyxiant gas, oxygen deficiency must be considered. May cause cardiac sensitization. Overexposure may cause loss of consciousness. Liquefied material may cause frostnip, frostbite and freeze burns.

HMIS Classification for Health: 1

Flammability: Danger!
Extremely flammable
Forms explosive mixtures with air
HMIS Classification for Flammability: 4

Reactivity: Stable
HMIS Classification for Reactivity: 0

3. PRODUCT HEALTH HAZARD INFORMATION

Ingestion: Not a normal route of exposure.

Skin: Skin absorption is unlikely.

Eye: Direct contact with liquefied material may cause frostbite and permanent damage.

Inhalation:

Concentrations greater than 5000 parts per million by volume in air can significantly lower the effective oxygen concentration, potentially causing loss of consciousness. Consider both concentration of Sweet Natural Gas and oxygen deficiency.

Symptoms include headache, excitation, euphoria, dizziness, uncoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death.

SPECIAL TOXIC EFFECTS:

Exposure to components of Sweet Natural Gas may cause the following specific symptoms, depending on the concentration and duration of exposure: eye flickering, muscle twitching and psychomotor agitation.

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: central nervous system, lungs, heart and testes.

This product contains asphyxiant and carbon dioxide, which may cause adverse reproductive and/or developmental effects.

Pre-existing medical conditions, which may be aggravated by exposure, include disorders of the respiratory and cardiovascular systems and central nervous system.

4. FIRST AID

Ingestion: Although risk of ingestion is extremely unlikely, seek immediate medical attention.

Skin Contact: Flush area with tepid water. Do not use hot water. Do not rub affected area.

Rewarming: Initiate controlled rapid rewarming in a warm bath with a temperature between 38 to 41.1 degrees Celsius (100 to 106 degrees Fahrenheit) as quickly as possible. The temperature of the bath should be kept constant. The bath should be large enough to permit complete immersion of the cryo-injured part, avoiding contact with the sides of the bath. A whirlpool bath would be ideal. Complete rewarming generally takes about 20 minutes and may be associated with increasing pain as thawing progresses.

Eye Contact: Burns due to either hot or cold contact require immediate medical attention. Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing.

Inhalation: Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure clear airway and give oxygen. Get immediate medical attention.

NOTES TO PHYSICIAN:

Hydrocarbons may sensitize the heart to epinephrine and other circulating catecholamines so that arrhythmias may occur. Careful consideration of this potential adverse effect should precede administration of epinephrine or other cardiac stimulants and the selection of bronchodilators.

5. PERSONAL PROTECTION INFORMATION

Eye Protection: Wear safety glasses with side shields. Have eye washing facilities readily available where eye contact can occur.

Skin Protection: Avoid skin contact with this material. Use appropriate chemical protective gloves when handling. Use good personal hygiene.

Respiratory Protection: Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

If ventilation cannot reduce airborne concentrations below acceptable limits, appropriate respiratory protection should be used. Use a NIOSH/MSHA approved self-contained breathing apparatus with full-face mask respirator in positive pressure mode.

6. PHYSICAL PROPERTIES

Boiling Point:	-259°F (-162°C) Based on Methane
Specific Gravity:	0.693
Melting Point:	-297°F (-183°C) Based on Methane
% Volatile:	ND
Vapor Pressure:	ND
Evaporation Rate (Water = 1):	Very Fast
Vapor Density (Air = 1):	0.56 Based on Methane
Viscosity:	ND
% Solubility in Water:	Slightly Soluable
Octanol/Water Partition Coefficient:	ND
Pour Point:	ND
pH:	ND
Freezing Point:	ND
Appearance/Odor:	Colorless liquid under pressure with a slight hydrocarbon odor Colorless gas at room temperature and pressure with a slight hydrocarbon odor

7. FIRE AND EXPLOSION DATA

Flash Point:	ND
Autoignition Temperature:	999°F (537°C) Based on Methane
Flammability Limits In Air (% By Vol.) Lower:	3% (LEL)
Flammability Limits In Air (% By Vol.) Upper:	15.4% (UEL)

Basic Fire Fighting Procedures: Gas fires should not be extinguished unless flow of gas can be immediately stopped. Shut off gas source and allow gas to burn out.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source flow if possible.

Containers can build up pressure if exposed to heat (fire). Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full-face mask and full protective equipment.

Unusual Fire and Explosion Hazards: Extremely flammable. Vapors form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources and flash back.

Fires involving this product may release carbon monoxide, carbon dioxide, reactive hydrocarbons and irritating vapors.

8. REACTIVITY DATA

Stability/Incompatibility: Incompatible with oxidizing agents. See precautions under Handling/Storage.

Hazardous Reaction/Decomposition Products: Combustion may produce CO, NO_x, SO_x, and reactive hydrocarbons.

9. ENVIRONMENTAL INFORMATION

Spill or Release to the Environment: Eliminate all sources of ignition. Isolate area and deny entry. If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

Emergency Action: Evacuate area endangered by gas. Keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. (See Personal Protection Information Section). Isolate for ½ mile in all directions if tank, rail car or tank truck is involved in release.

Spill or Leak Procedure: Keep ignition sources out of the area and shut off all ignition sources. Use water spray to reduce vapors. Shut off leak if safe to do so. Isolate hazard area and deny entry.

See Personal Protection Information Section.

Notification: This product, as supplied, contains no hazardous substances regulated under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302), or any extremely hazardous substances regulated under the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355), and thus a release of this product as supplied has no reporting requirements under these regulations.

Waste Disposal: This product, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability.

The transportation, storage, treatment and disposal of this waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements, as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

Sara Title III Information: Listed below are the hazard categories for the Superfund Amendments and Reauthorization Act (SARA) Section 311/312 (40 CFR 370):

Immediate Hazard: ☒
Pressure Hazard: ☒

Delayed Hazard: ☒
Reactivity Hazard: ☐

Fire Hazard: ☒

This product does not contain toxic chemicals (in excess of the applicable *de minimis* concentration) that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372).

Additional Environmental Regulatory Information: This product contains substances subject to accident prevention regulations when present above the threshold quantities of 10,000 pounds (Section 112 [r] of the Clean Air Act).

There may be specific regulations at the local, regional or state level that pertain to this product.

10. REGULATORY INFORMATION

Based on available information this product does not contain any components or chemicals currently known to the State of California to cause cancer, birth defects or reproductive harm at levels which would be subject to Proposition 65. Reformulation, use or processing of this product may affect its composition and require re-evaluation.

All major components of this product are listed on the TSCA Inventory.

11. SPECIAL PRECAUTIONS / SUPPLEMENTAL INFORMATION

Handling/Storage: Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools.

Do not eat, drink or smoke in areas of use or storage.

Empty Containers: Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards. Empty containers may contain product residue. Do not reuse without adequate precautions.

12. TRANSPORTATION REQUIREMENTS

General Transportation Information:

DOT Proper Shipping Name (49 CFR 172.101):	Natural gas, compressed
DOT Hazard Classes (49 CFR 172.101):	2.1
UN/NA Code (49 CFR 172.101):	UN 1971
Packing Group (49 CFR 172.101):	NA
Bill of Lading Description (49 CFR 172.202):	Natural gas, compressed, 2.1, UN 1971 (Hydrogen Sulfide, n-Hexane), RQ
DOT Labels Required (49 CFR 172.101):	Flammable gas
DOT Placards Required (49 CFR 172.504):	Flammable gas, UN 1971

13. INGREDIENTS/HEALTH HAZARD INFORMATION

Component	CAS NO.	Typical %*	EXPOSURE GUIDELINE	
			PPM	TYPE (AGENCY)
Methane	74-82-8	70 – 100		Simple Asphyxiant (ACGIH)
Ethane	74 – 84 - 0	0 – 20		Simple Asphyxiant (ACGIH)
Nitrogen	7727 – 37 – 9	0 – 5		Simple Asphyxiant (ACGIH)
Propane	74 – 98 – 6	0 – 5	1000	8-Hour TWA (OSHA) Simple Asphyxiant (ACGIH)
Carbon Dioxide	124 – 38 – 9	0 – 1	5000 5000 30,000	8-Hour TWA (OSHA) 8-Hour TWA (ACGIH) 15-MIN STEL (ACGIH)
Butane	106 – 97 – 8	Trace	800	8-Hour TWA (ACGIH)
Isobutane	75 – 28 – 5	Trace		ND

* Values do not reflect absolute minimums and maximums; those values may vary from time to time.

ND = No Data

NA = Not Applicable

MSDS NO: 1001
Sweet Natural Gas

REVISION DATE: 3/05/02

REPLACES SHEET DATED: NA

COMPLETED BY: Enbridge (US) Inc. EHS Department

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MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA DIAMOND *
Gas Control (888) 650-8099 CHEMTREC Assistance (800) 424-9300	Phone (713) 650-8900 Fax (713) 821-2080	
MSDS NUMBER 1000		

MANUFACTURER/SUPPLIER: **Enbridge, (U.S.), Inc.**
1100 Louisiana Street, Suite 3300
Houston, Texas 77002

1. PRODUCT IDENTIFICATION

Name:

NATURAL GASOLINE

CAS NUMBER: 68425-31-0
Synonym/Product Name: Casinghead Gasoline, 14#
 Gasoline, M-Grade,
 Hydrocarbon Mixture
Chemical Family: Aliphatic Hydrocarbon
Molecular Formula: NA
Molecular Weight: ND

2. PRODUCT HAZARD SUMMARY

Health:

Warning!

May cause cardiac sensitization. May be harmful or fatal if swallowed or inhaled. Aspiration hazard if swallowed – can enter lungs and cause damage. Overexposure may cause CNN depression. May be irritating to the skin, eyes and respiratory tract. Potential reproductive hazard. Potential cancer hazard. Long-term exposure to vapors has caused cancer in some laboratory animals. Contains benzene which is a known human carcinogen.

HMIS Classification for Health: 1

Flammability: Danger!
Extremely Flammable
Forms Explosive Mixtures with Air
HMIS Classification for Flammability: 4

Reactivity: Stable
HMIS Classification for Reactivity: 0

3. PRODUCT HEALTH HAZARD INFORMATION

Ingestion: Slightly toxic. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea. Aspiration into lungs may cause chemical pneumonia and lung damage.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, drowsiness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the amount swallowed.

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Skin: Slightly to moderately irritating. Contact may cause reddening, itching and inflammation. Defatting agent.

Repeated or prolonged contact may result in drying, reddening, itching, pain, inflammation, cracking and possible secondary infection with tissue damage.

Absorption from prolonged or repeated skin contact may cause systemic toxicity.

Eye: Direct contact may cause irritation, redness, tearing and blurred vision.

Inhalation:

Asphyxiant gas

Concentrations greater than 5000 parts per million by volume in air can significantly lower the effective oxygen concentration, potentially causing loss of consciousness. Consider both concentration of Natural Gasoline and oxygen deficiency.

Inhalation (cont):

Symptoms include headache, excitation, euphoria, dizziness, uncoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death.

Dog experiments at 5000 PPM-air indicate that butane may cause cardiac sensitization, including arrhythmias (irregular heartbeats) and possibly even death due to cardiac arrest. Clinical judgment is necessary regarding whether an exposure actually occurred for any given individual.

SPECIAL TOXIC EFFECTS:

Exposure may cause the following specific symptoms, depending on the concentration and duration of exposure: anemia, pallor, nervousness and loss of appetite.

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: kidney, heart, liver, fetus, central nervous system, spleen and pancreas.

Exposure to high concentrations of petroleum hydrocarbon mists or vapors may lead to oil chemical pneumonia.

Irritating and toxic hydrogen sulfide gas may be found in confined vapor space.

Benzene is carcinogenic to laboratory animals. There is an association between occupational exposure to benzene and human leukemia. Carcinogenic determinations: IARC - Human positive and Animal suspected carcinogen; NTP - Known carcinogen; ACGIH - Suspected carcinogen. Acute benzene poisoning causes central nervous system depression. Chronic exposure affects the hematopoietic system causing blood disorders including anemia and pancytopenia.

SPECIAL TOXIC EFFECTS (cont):

This product contains small amounts of n-Hexane. n-Hexane is a skin, eye and respiratory tract irritant. It is a cardiac sensitizer, central nervous system depressant and neurotoxin. Exposure may result in dizziness, asphyxia, anesthesia, brain damage and cardiac arrest. Repeated or prolonged exposure may result in damage to the testes and peripheral neuropathy, progressive weakness, facial and limb numbness, color vision abnormalities and paralysis of the limbs. It has been shown to produce fetal effects in a two-generation animal study, and in results of a NTP cancer study it produced liver tumors in female mice. Persons with skin, pulmonary, liver or kidney disorders may be at increased risk from exposure.

Pre-existing medical conditions, which may be aggravated by exposure, include disorders of the skin, heart, kidney, liver and respiratory system.

4. FIRST AID

Ingestion: Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs, keep head below hips to prevent aspiration and monitor for breathing difficulty. Get immediate medical attention.

Keep affected person warm and at rest.

Skin Contact: Remove contaminated clothing. Wash affected areas with soap and water.

Eye Contact: Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

Inhalation: Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure clear airway and give oxygen. Keep affected person warm and at rest. Get immediate medical attention.

NOTES TO PHYSICIAN:

Aspiration of low viscosity petroleum hydrocarbons may cause severe pneumonitis (oil pneumonia). Vomiting should not be induced. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

In cases of acute poisoning, artificial respiration with administration of oxygen may be useful for support. Do not give Epinephrine, Ephedrine or similar adrenergic drugs. They may induce fatal ventricular fibrillation. Electrocardiographic monitoring should be carried out with severely ill patients to anticipate possible cardiac arrest.

Anemia may require the usual supportive measures. Medical evaluation of acute overexposure should include hematological determinations until stable.

In severe, acute and chronic poisoning, both renal and hepatic damage may occur and should be anticipated in such cases. Respiratory and pulmonary problems may require special attention. After severe acute symptoms have been alleviated, it may be advisable to consider periodic monitoring of the patient until such time as the likelihood of other adverse effects can be discounted.

5. PERSONAL PROTECTION INFORMATION

Eye Protection: Wear safety glasses with eye shields. If eye contact is likely, chemical type goggles or safety glasses with side shields and face shield should be worn. A means for quick drenching or flushing of the eyes should be provided for first aid purposes.

Skin Protection: Avoid skin contact with this material. Use appropriate chemical protective gloves when handling. Use good personal hygiene.

Respiratory Protection: Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

A NIOSH/MSHA approved air-purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

6. PHYSICAL PROPERTIES

Boiling Point:	58°F (14°C)
Specific Gravity:	0.65 – 0.67
Melting Point:	ND
% Volatile:	ND
Vapor Pressure:	14 – 31 PSI @ 100°F (38°C)
Evaporation Rate (Water = 1):	Moderately Fast
Vapor Density (Air = 1):	3 – 4
Viscosity:	ND
% Solubility in Water:	Slight
Octanol/Water Partition Coefficient:	ND
Pour Point:	ND
pH:	ND
Freezing Point:	ND
Appearance/Odor:	Clear, colorless liquid with a distant hydrocarbon odor

7. FIRE AND EXPLOSION DATA

Flash Point:	-45°F (-14°C) Cleveland Open Cup
Autoignition Temperature:	536°F (280°C)
Flammability Limits In Air (% By Vol.) Lower:	1.4% (LEL)
Flammability Limits In Air (% By Vol.) Upper:	7.6% (UEL)

Basic Fire Fighting Procedures: Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire. Evacuate area and fight fire from a safe distance.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full-face mask and full protective equipment.

Unusual Fire and Explosion Hazards: Extremely flammable. Vapors form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources and flash back.

Fires involving this product may release carbon monoxide, carbon dioxide, reactive hydrocarbons and irritating vapors.

8. REACTIVITY DATA

Stability/Incompatibility: Incompatible with oxidizing agents. See precautions under Handling/Storage.

Hazardous Reaction/Decomposition Products: Combustion may produce CO, NOx, and reactive hydrocarbons.

9. ENVIRONMENTAL INFORMATION

Spill or Release to the Environment: Eliminate all sources of ignition. Isolate area and deny entry. If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

Emergency Action: Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for ½ mile in all directions if tank, rail car or tank truck is involved in release. Evacuate area endangered by release as required. See Personal Protection Information Section.

Spill or Leak Procedure: Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e.g., dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal. Shut off leak if safe to do so. See Personal Protection Information Section.

Notification: This product, as supplied, is exempt from reporting under the CERCLA petroleum exemption provided the product is not released into navigable surface water or land near surface waters. Any release of this product that results in a release into surface waters or on land near surface waters must be reported to the National Response Center (800-424-8802) as described in 40 CFR 110.6. Check state and local regulations for any additional requirements, as these may be more restrictive than federal laws and regulations.

Failure to report may result in substantial civil and criminal penalties.

Waste Disposal: This product, as supplied, when discarded or disposed of, may be hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability and benzene content. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

The transportation, storage, treatment and disposal of this waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements, as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

Sara Title III Information: Listed below are the hazard categories for the Superfund Amendments and Reauthorization Act (SARA) Section 311/312 (40 CFR 370):

Immediate Hazard: x

Delayed Hazard: x

Fire Hazard: x

Pressure Hazard: x

Reactivity Hazard:

This product contains the following toxic chemicals subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372):

Components:	CAS Number:	Maximum %
n-Hexane	110-54-3	10
Cyclohexane	110-82-7	3.5
Benzene	71-43-2	0.5

This information is provided for SARA 313 information purposes only – not for health and safety determination.

Additional Environmental Regulatory Information: This product contains one or more components designated as hazardous substances or toxic pollutants pursuant to the Federal Clean Water Act (40 CFR 116.4 Table A; 40 CFR 401.15). Any un-permitted introduction of this product into a facility stormwater or wastewater discharge may constitute a violation of the Clean Water Act. Facilities must notify the appropriate permitting agency prior to introducing this product into the aforementioned discharges.

This product contains one or more substances listed as hazardous, toxic or flammable air pollutants under Section 112 of the Clean Air Act.

There may be specific regulations at the local, regional or state level that pertain to this product.

ND = No Data

NA = Not Applicable

MSDS NO: 1000
Natural Gasoline

10. REGULATORY INFORMATION

All major components of this product are listed on the TSCA Inventory.

11. SPECIAL PRECAUTIONS / SUPPLEMENTAL INFORMATION

Handling/Storage: Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools.

Do not eat, drink or smoke in areas of use or storage.

Empty Containers: Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards. Empty containers may contain product residue. Do not reuse without adequate precautions.

12. TRANSPORTATION REQUIREMENTS

General Transportation Information:

DOT Proper Shipping Name (49 CFR 172.101):	Gasoline
DOT Hazard Classes (49 CFR 172.101):	3
UN/NA Code (49 CFR 172.101):	UN1203
Packing Group (49 CFR 172.101):	PGII
Bill of Lading Description (49 CFR 172.202):	Gasoline, 3, UN1203, PGII
DOT Labels Required (49 CFR 172.101):	Flammable Liquid
DOT Placards Required (49 CFR 172.504):	Flammable Liquid, UN1203

13. INGREDIENTS/HEALTH HAZARD INFORMATION

Component	CAS NO.	Typical %*	EXPOSURE GUIDELINE	
			PPM	TYPE (AGENCY)
A Complex Combination of Hydrocarbons consisting predominately of saturated Aliphatic Hydrocarbons in the range of C5-C8	68425 – 31 – 0	86 – 100		Oil Mist, Mineral: 5 MG/M3 8-Hour TWA (OSHA) 5 MG/M3 8-Hour TWA (ACGIH) 10 MG/M3 15-Min STEL (ACGIH)
n-Hexane	110 – 54 – 3	0 – 10	500 50	8-Hour TWA (OSHA) 8-Hour TWA (ACGIH)
Cyclohexane	110 – 82 – 7	0 – 3.5	300 300	8-Hour TWA (OSHA) 8-Hour TWA (ACGIH)
Toluene	108 – 88 – 3	0 – 0.75	200 50	8-Hour TWA (OSHA) 8-Hour TWA (ACGIH)
Benzene	71 – 43 – 2	0 – 0.5	1 5 0.5	** 8-Hour TWA (OSHA) 15-Min STEL (OSHA) 8-Hour TWA (ACGIH)
Xylene	1330 – 20 – 7	Trace	100 100 150	8-Hour TWA (OSHA) 8-Hour TWA (ACGIH) 15-Min STEL (ACGIH)
Ethylbenzene	100 – 41 – 4	Trace	100 100 125	8-Hour TWA (OSHA) 8-Hour TWA (ACGIH) 15-Min STEL (ACGIH)

* Values do not reflect absolute minimums and maximums; those values may vary from time to time.

** See REGULATORY INFORMATION section for more information.

ND = No Data

NA = Not Applicable

MSDS NO: 1000
Natural Gasoline

REVISION DATE: 3/05/02

REPLACES SHEET DATED: NA

COMPLETED BY: Enbridge (U.S.) Inc. EHS Department

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MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA DIAMOND *
Gas Control (888) 650-8099 CHEMTREC Assistance (800) 424-9300	Phone (713) 650-8900 Fax (713) 821-2080	4 - Extreme 3 - High 2 - Moderate 1 - Slight 0 - Insignificant * - See text
MSDS NUMBER 1005		

MANUFACTURER/SUPPLIER: **Enbridge, (U.S.), Inc.**
1100 Louisiana Street, Suite 3300
Houston, Texas 77002

1. PRODUCT IDENTIFICATION

CRUDE OIL, SWEET

Product Name	Crude Oil – Sweet
Synonym/Product Name:	Field Crude, Separator Crude
Chemical Family:	Petroleum Hydrocarbon
Molecular Formula:	Mix of heavy hydrocarbons
Molecular Weight:	Varies

2. PRODUCT HAZARD SUMMARY

Health: May contain or liberate poisonous hydrogen sulfide gas. Cancer hazard. Overexposure may cause damage to the peripheral nervous system. Use ventilation adequate to keep exposures below recommended limits. Avoid breathing vapor or mist. Avoid contact with eyes, skin or clothing. Do not taste or swallow. Wash thoroughly after handling.
 HMIS Classification for Health: 1

Flammability: Flammable liquid and vapor. Keep away from heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, mechanical/electrical equipment).
 HMIS Classification for Flammability: 3

Reactivity: Stable under normal conditions. Avoid all sources of ignition.
HMIS Classification for Reactivity: 0

3. PRODUCT HEALTH HAZARD INFORMATION

Ingestion: Low degree of toxicity by ingestion.

Skin: Contact may cause mild skin irritation including redness, burning and drying and cracking of the skin. No harmful effects from skin absorption are expected.

Eye: Contact may cause mild eye irritation, including stinging, watering, redness and swelling.

Inhalation: Low to moderate degree of toxicity by inhalation.

Signs and Symptoms: Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, diarrhea, transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination and fatigue).

Cancer: A component is a known human cancer hazard (see Special Toxic Effects below).

Target Organs: Overexposure to a component may cause injury to the peripheral nervous system. There is limited evidence from animal studies that overexposure may cause injury to the male reproductive system.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin, respiratory (asthma-like), male reproductive and peripheral nerve disorders. Exposure to high concentrations of this material may increase the sensitivity of the heart to certain drugs. Persons with pre-existing heart disorders may be more susceptible to this effect.

Comments: While this material is sweet crude oil, this material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue, so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure and death.

Special Toxic Effects:**Crude Oil**

Carcinogenicity: Chronic application of crude oil to mouse skin resulted in an increase of skin tumors. Crude oil has been identified as a carcinogen by IARC.

Developmental: Dermal exposure to crude oil during pregnancy resulted in limited evidence of developmental toxicity in laboratory animals. Decreased fetal weight and increased resorptions were noted at maternally toxic doses. No significant effects on pup growth or other developmental landmarks were observed postnatally.

n-Hexane (CAS 110-54-3)

Target Organs – Excess exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesia of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone. Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Benzene (CAS 71-43-2)

Carcinogenicity: Benzene is a known animal carcinogen and is known to produce leukemia in humans. Benzene has been identified as a human carcinogen by NTP, IARC and OSHA.

4. FIRST AID

Ingestion: First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

Skin Contact: Wipe material from skin and remove contaminated clothing. Cleanse affected areas thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. If irritation or redness develops, seek medical attention.

Eye Contact: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.

Inhalation: If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, qualified personnel should administer oxygen. Seek immediate medical attention.

Notes to Physician: Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL.

Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of this material (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for development of cardiac arrhythmias.

This material contains hydrogen sulfide. In high doses, hydrogen sulfide may produce pulmonary edema, and respiratory depression or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. If unresponsive, nitrites may be an effective antidote.

5. PERSONAL PROTECTION INFORMATION

Eye Protection: Approved eye protection to safeguard against potential eye contact, irritation or injury is recommended. Depending on conditions of use, a face shield may be necessary.

Skin Protection: The use of gloves impermeable to the specific material handled is advised to prevent skin contact and possible irritation.

Respiratory Protection: Wear a positive pressure air supplied respirator in situations where there may be potential for airborne exposure to H₂S above exposure limits. H₂S has poor warning properties and appropriate air purifying cartridges are not commercially available. A NIOSH certified air purifying respirator with an organic vapor cartridge may be used under conditions where H₂S is not detected, and airborne concentrations of hydrocarbons are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is a potential for an uncontrolled release, exposure levels are not known or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed when workplace conditions warrant a respirator's use.

Engineering Controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

6. PHYSICAL PROPERTIES

Boiling Point:	100-1000°F
Specific Gravity:	0.74 – 0.99 @ 39.2°F (Water = 1)
Freezing/Melting Point:	ND

ND = No Data

NA = Not Applicable

MSDS NO: 1005
Crude Oil

% Volatile:	ND
Vapor Pressure:	ND
Vapor Density (Air = 1):	ND
Viscosity	ND
% Solubility in Water:	0%
Density (lb/gal)	Varies, but estimated at 7.2 lb/gal
Physical State:	Liquid
pH:	ND
Appearance:	Light tan, yellowish or greenish to black
Odor:	Petroleum smell

7. FIRE AND EXPLOSION DATA

Flash Point	<100°F
Autoignition Temperature:	ND
Flammability Limits In Air (% By Vol.) Lower:	0.9
Flammability Limits In Air (% By Vol.) Upper:	7.0

Basic Fire Fighting Procedures: Long-duration fires involving crude oil stored in tanks may result in a boilover. The contents of the tank may be expelled beyond the containment dikes or ditches. All personnel should be kept back a safe distance when a boilover is anticipated (reference NFPA 11). For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces or when explicitly required by DOT, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant. Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

Extinguishing Media: Dry chemical, carbon dioxide or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Unusual Fire and Explosion Hazards: This material is flammable and may be ignited by heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, or mechanical/electrical equipment). Vapors may travel considerable distances to a source of ignition where they can ignite, flashback or explode. May create vapor/air explosion hazard indoors, outdoors or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

8. REACTIVITY DATA

Stability/Incompatibility: Stable under normal conditions of storage and handling. Flammable liquid and vapor. Vapor can cause flash fire.

Avoid contact with strong oxidizing agents.

Hazardous Reaction/Decomposition Products: Combustion can yield carbon dioxide, carbon monoxide, other organic compounds and sulfur oxides.

9. ENVIRONMENTAL INFORMATION

Spill or Release to the Environment: Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory equipment as conditions warrant. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems and natural waterways. Dike far ahead of spill for later recovery or disposal. Use foam on spills to minimize vapors. Spilled material may be absorbed into an appropriate absorbent material.

Notify fire authorities and appropriate federal, state and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount into navigable waters, notify the National Response Center (800-424-8802).

Notification: Notify fire authorities and appropriate federal, state and local agencies.

Waste Disposal: This material, if discarded as produced, would be a RCRA "characteristic" hazardous waste due to the characteristics of ignitability (D001), benzene (D018) and possibly reactivity (D003). If the material is spilled to soil or water, characteristic testing of the contaminated materials is recommended. Further, this waste is subject to the land disposal restrictions in 40 CFR 268.40 and may require treatment prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent than the federal requirements.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

Sara Title III Information: This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Hydrogen Sulfide	CAS – 7783-06-4	Weight % - <1.0
n-Hexane	CAS – 110-54-3	Weight % - 0-2
Benzene	CAS – 71-43-2	Weight % - 0 – 0.1

10. REGULATORY INFORMATION

EPA Reportable Quantity: The estimated reportable quantity (RQ) for this material is based on the weight % shown below:

RQ based on benzene – The RQ for benzene is 10 pounds, which equals 10,000 pounds of crude oil (1388 gallons). The RQ is based on 0.1 wt. % benzene.

RQ based on n-Hexane – The RQ for n-Hexane is 5000 pounds, which equals 250,000 pounds of crude oil (34,722 gal). The RQ is based on 2 wt. % n-Hexane.

11. SPECIAL PRECAUTIONS / SUPPLEMENTAL INFORMATION

Handling/Storage: The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits. Use good personal hygiene practice.

Keep containers tightly closed. In a tank, barge or other closed container, the vapor space above the materials that contain hydrogen sulfide may result in concentrations immediately dangerous to life and health (IDLH). Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces and all sources of ignition. Post area "No Smoking or Open Flame". Store only in approved containers. Keep away from any incompatible material. Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

Empty Containers: "Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1 and other governmental and industrial references pertaining to cleaning, repairing, welding or other contemplated operations.

12. TRANSPORTATION REQUIREMENTS**General Transportation Information:**

DOT Proper Shipping Name (49 CFR 172.101): Petroleum Crude Oil
 DOT Hazard Classes (49 CFR 172.101): 3
 UN/NA Code (49 CFR 172.101): UN1267
 Packing Group (49 CFR 172.101): I
 Bill of Lading Description (49 CFR 172.202): Petroleum Crude Oil
 DOT Labels Required (49 CFR 172.101): Flammable Liquid

13. INGREDIENTS/HEALTH HAZARD INFORMATION

Component	CAS NO.	Typical % [*] by weight	EXPOSURE GUIDELINE	
			PPM	Agency - Type
Crude Oil	8002-05-9	100	Not Established	
n-Hexane	110-54-3	0-2	50 500	ACGIH – TWA OSHA – TWA
Hydrogen sulfide	7783-07-5	<1	10 15 20 10	ACGIH – TWA ACGIH – STEL OSHA – CEIL MSHA – TWA
Benzene	71-43-2	0 – 0.1	0.5 2.5 1 5 25	ACGIH – TWA, Skin ACGIH – STEL, Skin OSHA – TWA OSHA – STEL MSHA – CEIL, Skin
Note that state, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information				

* Values do not reflect absolute minimums and maximums; those values may vary from time to time.

REVISION DATE: 07/28/08

REPLACES SHEET DATED: NA

COMPLETED BY: Enbridge (US) Inc. EHS Department

NOTE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet (MSDS). However, MSDS's may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices or from any hazards inherent in the nature of the product.



MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA DIAMOND * 4 - Extreme 3 - High 2 - Moderate 1 1 0 1 - Slight 0 - Insignificant * - See text
Gas Control (888) 650-8099 CHEMTREC Assistance (800) 424-9300	Phone (713) 650-8900 Fax (713) 821-2080	
MSDS NUMBER 1010		

MANUFACTURER/SUPPLIER: **Enbridge, (U.S.), Inc.**
1100 Louisiana Street, Suite 3300
Houston, Texas 77002

1. PRODUCT IDENTIFICATION

SLOP OIL

Product Name	Slop Oil
Synonym/Product Name:	Lubricating Oil, Reclaimed/Recycled Oil
Chemical Family:	Mixture
Molecular Formula:	Mix of heavy hydrocarbons
Molecular Weight:	Varies
CAS Number:	69029-75-0

2. PRODUCT HAZARD SUMMARY

Health: May contain or liberate poisonous hydrogen sulfide gas. Cancer hazard. Overexposure may cause damage to the peripheral nervous system. Use ventilation adequate to keep exposures below recommended limits. Avoid breathing vapor or mist. Avoid contact with eyes, skin or clothing. Do not taste or swallow. Wash thoroughly after handling.
 HMIS Classification for Health: 1

Flammability: Flammable Liquid, can release vapors that form flammable mixtures at temperatures at or above the flashpoint. "Empty" containers retain product residue and can be dangerous. Keep away from heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, mechanical/electrical equipment).
HMIS Classification for Flammability: 1

Reactivity: Stable under normal conditions. Avoid all sources of ignition.
HMIS Classification for Reactivity: 0

3. PRODUCT HEALTH HAZARD INFORMATION

Ingestion: Low to moderate degree of toxicity by ingestion. Major health threat occurs from danger of breathing (aspiration) liquid drops into lungs, especially during vomiting. Ingestion may cause nausea, vomiting, diarrhea and central nervous system effects similar to alcohol intoxication.

Skin: Prolonged contact may cause mild skin irritation including redness, burning and drying and cracking of the skin. No harmful effects from skin absorption are expected.

Eye: Contact may cause mild eye irritation, including stinging, watering, redness and swelling.

Inhalation: Prolonged or excessive exposure may cause irritation to the nose, throat, lungs and respiratory tract.

Signs and Symptoms: Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, diarrhea, transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination and fatigue).

Cancer: A component (benzene) is a known human cancer hazard (see Special Toxic Effects below). Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure.

Target Organs: Overexposure to a component (toluene) may cause injury to the peripheral nervous system. There is limited evidence from animal studies that overexposure may cause injury to the male reproductive system.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin, respiratory (asthma-like), male reproductive and peripheral nerve disorders. Exposure to high concentrations of this material may increase the sensitivity of the heart to certain drugs. Persons with pre-existing heart disorders may be more susceptible to this effect.

Special Toxic Effects:

n-Hexane (CAS 110-54-3)

Target Organs – Excess exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesia of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone. Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Toluene (CAS 108-88-3)

Target Organs – Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system damage in lab animals.

Developmental – Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in lab animals.

Benzene (CAS 71-43-2)

Carcinogenicity: Benzene is a known animal carcinogen and is known to produce leukemia in humans. Benzene has been identified as a human carcinogen by NTP, IARC and OSHA.

Hydrogen Sulfide (CAS 7783-06-4)

This material contains hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue, so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure and death. No definitive information on carcinogenicity, mutagenicity, target organs or developmental toxicity.

4. FIRST AID

Ingestion: Aspiration hazard. Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe damage. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration.

Skin Contact: Wipe material from skin and remove contaminated clothing. Cleanse affected areas thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. If irritation or redness develops, seek medical attention.

Eye Contact: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water for 15 minutes, with eyelids held open. If symptoms persist, seek medical attention.

Inhalation: If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, qualified personnel should administer oxygen. Seek immediate medical attention.

Notes to Physician: Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of this material (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for development of cardiac arrhythmias.

This material contains hydrogen sulfide. In high doses, hydrogen sulfide may produce pulmonary edema, and respiratory depression or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. If unresponsive, nitrites may be an effective antidote.

5. PERSONAL PROTECTION INFORMATION

Eye Protection: Safety glasses or goggles are recommended when there is a possibility of splashing or spraying.

Skin Protection: The use of gloves (nitrile or neoprene) is advised to prevent skin contact and possible irritation. Depending on conditions, the use of an apron or chemical protective clothing may be necessary.

Respiratory Protection: A NIOSH certified air purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations of hydrocarbons are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is a potential for an uncontrolled release, exposure levels are not known or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed when workplace conditions warrant a respirator's use.

Engineering Controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

6. PHYSICAL PROPERTIES

Boiling Point:	>500°F
Specific Gravity:	>.80 @ 60°F (Water = 1)
Freezing/Melting Point:	ND
% Volatile:	Nil
Vapor Pressure:	<.1 mmHg at 20°C
Vapor Density (Air = 1):	>1
Viscosity	>100 SUS at (100°F)
% Solubility in Water:	0%
Density (lb/gal)	Varies, but estimated at 6 lb/gal
Physical State:	Liquid
pH:	ND
Appearance:	Clear to dark amber in color
Odor:	Petroleum smell

7. FIRE AND EXPLOSION DATA

Flash Point	>250°F COC (Cleveland Open Cup)
Auto Ignition Temperature:	> 250°F
Flammability Limits In Air (% By Vol.) Lower:	Varies, est. 1.0%
Flammability Limits In Air (% By Vol.) Upper:	Varies, est. 7.0%

Basic Fire Fighting Procedures: Long-duration fires involving natural gas condensate stored in tanks may result in a boilover. The contents of the tank may be expelled beyond the containment dikes or ditches. All personnel should be kept back a safe distance when a boilover is anticipated (reference NFPA 11). For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces or when explicitly required by DOT, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant. Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

Extinguishing Media: Any extinguisher capable of handling Class B fires is recommended, including extinguishing media such as CO₂, dry chemical or foam. Water spray is recommended to cool or protect exposed materials or structures. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Unusual Fire and Explosion Hazards: This material is flammable and may be ignited by heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, or mechanical/electrical equipment). Vapors may travel considerable distances to a source of ignition where they can ignite, flashback or explode. May create vapor/air explosion hazard indoors, outdoors or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

8. REACTIVITY DATA

Stability/Incompatibility: Stable under normal conditions of storage and handling. Flammable liquid and vapor. Vapor can cause flash fire.

Avoid contact with strong oxidizing agents.

Hazardous Reaction/Decomposition Products: Combustion can yield carbon dioxide, carbon monoxide, other organic compounds and non-combusted hydrocarbons.

9. ENVIRONMENTAL INFORMATION

Spill or Release to the Environment: Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of spill/release, isolate immediate hazard area and keep unauthorized personnel out. Product may release large amounts of flammable vapors (e.g., methane, ethane and propane) at or below ambient temperature depending on source and process conditions. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory equipment as conditions warrant. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems and natural waterways. Dike far ahead of spill for later recovery or disposal. Use foam on spills to minimize vapors. Spilled material may be absorbed into an appropriate absorbent material.

Notify fire authorities and appropriate federal, state and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount into navigable waters, notify the National Response Center (800-424-8802).

Notification: Notify fire authorities and appropriate federal, state and local agencies.

Waste Disposal: Consult federal, state and local waste regulations to determine appropriate disposal options.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

Sara Title III Information: This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Toluene	CAS - 108-88-3	Weight % - <2.0
n-Hexane	CAS - 110-54-3	Weight % - up to 10%
Benzene	CAS - 71-43-2	Weight % - 0 - 0.3

10. REGULATORY INFORMATION

EPA Reportable Quantity: The estimated reportable quantity (RQ) for this material is based on the weight % shown below:

RQ based on benzene – The RQ for benzene is 10 pounds, which equals 3,333 pounds of Slop Oil (556 gallons). The RQ is based on 0.3 wt. % benzene.

RQ based on n-Hexane – The RQ for n-Hexane is 5000 pounds, which equals 50,000 pounds of Slop Oil (8,333 gallons). The RQ is based on 10 wt. % n-Hexane.

RQ based on toluene – The RQ for toluene is 1000 pounds, which equals 50,000 pounds of Slop Oil (8,333 gallons). The RQ is based on 2 wt. % toluene.

11. SPECIAL PRECAUTIONS / SUPPLEMENTAL INFORMATION

Handling/Storage: The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits. Use good personal hygiene practice.

Keep containers tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces and all sources of ignition. Post area "No Smoking or Open Flame". Store only in approved containers. Keep away from any incompatible material. Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

Depending on the source of Slop Oil, there could be some amount of NORM (naturally occurring radioactive materials) in the scale, deposit and sludge associated with this material. Proper measurements should be taken prior to handling this material or any equipment contaminated with this material. If NORM is indicated, refer to API Bulletin E2, "Bulletin on Management of Naturally Occurring Radioactive Materials in Oil and Gas Production," for additional information.

Empty Containers: "Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1 and other governmental and industrial references pertaining to cleaning, repairing, welding or other contemplated operations.

12. TRANSPORTATION REQUIREMENTS**General Transportation Information:**

DOT Proper Shipping Name (49 CFR 172.101): Petroleum distillates, n.o.s.
DOT Hazard Classes (49 CFR 172.101): 3
UN/NA Code (49 CFR 172.101): UN1268
Packing Group (49 CFR 172.101): III
Bill of Lading Description (49 CFR 172.202): Petroleum distillates, n.o.s.
DOT Labels Required (49 CFR 172.101): Flammable Liquid

Please note that the actual shipping name and associated data can vary due to the properties of the product. Other acceptable shipping names may include Gasoline UN1203, Flammable liquids, n.o.s. (pentane) UN1993 or Hydrocarbons, Liquid n.o.s. (condensate) UN3295.

13. INGREDIENTS/HEALTH HAZARD INFORMATION

Component	CAS NO.	Typical %* by weight	EXPOSURE GUIDELINE	
			PPM	Agency - Type
Slop Oil	69029-75-0	100	Not Listed	OSHA -TWA
Pentane	109-66-0	30-70	600 1000 500	ACGIH - TWA OSHA - TWA MSHA - TWA
n-Hexane	110-54-3	0-10	50 500	ACGIH - TWA (skin) OSHA - TWA
Toluene	108-88-3	0-2	50 200 300 100	ACGIH - TWA (skin) OSHA - TWA OSHA - CEIL MSHA - TWA
Benzene	71-43-2	0 - 0.3	0.5 2.5 1 5 25	ACGIH - TWA, Skin ACGIH - STEL, Skin OSHA - TWA OSHA - STEL MSHA - CEIL, Skin
Hydrogen Sulfide	7783-07-5	> 0.5	10 15 20 10	ACGIH - TWA ACGIH - STEL OSHA - CEIL MSHA - TWA
Note that state, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information				

* Values do not reflect absolute minimums and maximums; those values may vary from time to time.

ND = No Data

NA = Not Applicable

MSDS NO: 1010
Slop Oil

REVISION DATE: 07/28/08

REPLACES SHEET DATED: NA

COMPLETED BY: Enbridge, (U.S.), Inc. EHS Department

NOTE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet (MSDS). However, MSDSs may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices or from any hazards inherent in the nature of the product.

Appendix E

Oil Spill Removal Techniques

Method	Description	When to use
1. NO ACTION	No action is taken. Monitoring continues.	Extremely remote or inaccessible shorelines. When natural removal rates are very fast.
2. MANUAL REMOVAL	Remove surface oil manually (hands, rakes, shovels, etc.). No mechanized equipment.	Light to moderate oiling conditions.
3. PASSIVE COLLECTION (SORBENTS)	Remove oil by absorption onto oleophilic material placed in the intertidal zone.	As a secondary treatment method after gross oil removal, and along sensitive shorelines where access is restricted.
4. DEBRIS REMOVAL	Manual or mechanical removal of debris from the upper beach face and the zone above high tide beyond the normal wash of waves. Can include cutting and removal of oiled logs.	When driftwood and debris is heavily contaminated and either a potential source of chronic oil release, an aesthetic problem, or a source of contamination for other organisms on the shoreline.
5. TRENCHING	Remove subsurface oil from permeable substrates by digging trenches to the depth of the oil and remove oil floating on the water table by vacuum pump or super sucker. Water flooding or high-pressure spraying at ambient temperatures can be used to flush oil to the trench.	When large quantities of oil penetrate deeply into permeable sediments and cannot be removed by surface flooding. The oil must be liquid enough to flow at ambient temperatures.
6. SEDIMENT REMOVAL	Oiled sediments are removed by either manual use of hand tools or mechanical use of various kinds of motorized equipment. The oiled material must be transported and disposed of off-site.	When only very limited amounts of oiled sediments have to be removed. Should not be considered where beach erosion may result. Remove the sediments only to the depth of oil penetration, which can be difficult with heavy equipment.
7. AMBIENT – WATER FLOODING (DELUGE)	Ambient seawater is pumped through holes in header pipes and flows down the beach face to the water. On porous beaches, water flows through the substrate pushing loose oil ahead of it. Oil is trapped by booms and picked up with a skimmer or other suitable equipment.	On heavily oiled shorelines when the oil is stiff fluid and loosely adhering to the substrate; and where oil has penetrated into cobble or boulder beaches.

Method	Description	When to use
8. AMBIENT – WATER / LOW - PRESSURE WASHING	Low-pressure washing (<50 psi) is used to flush oil to the water's edge for pickup with skimmers or sorbents. It can be used with a deluge system to prevent released oil from re-adhering to the substrate.	Where adhered oil is still fresh and must be removed due to continued release of oil.
9. AMBIENT-WATER / HIGH - PRESSURE WASHING	Similar to low-pressure washing except water pressure is up to 100 psi. Remove oil that has adhered to rocks or man-made structures. May require placement of sorbents directly below treatment areas.	When low-pressure washing is not effective for removal of oil. When directed water jet can remove oil from hard to reach sites. To remove oil from man-made structures for aesthetic reasons.
10. WARM WATER MODERATE TO HIGH-PRESSURE WASHING	Heated seawater (ambient to 90F) is applied at moderate to high. If not effective, "deluge" flooding and additional low or high-pressure washing can be used to float the oil to the water's edge for pickup. Oil is trapped by booms and picked up with skimmers or sorbents.	When oil has weathered to the point that low pressure washing with ambient water is not effective for removal of adhered oil, which must be recovered due to continued release of oil. To remove oil from man-made structures for aesthetic reasons.
11. HOT-WATER/ HIGH-PRESSURE WASHING	Water heaters mounted offshore on barges or small land-based units, heat water to temperatures from 90°F to 170°F, which is usually sprayed by hand with high-pressure wands. Requires immediate use of vacuum trucks to remove the oil/water runoff or collection with skimmers or sorbents.	When the oil has weathered to the point that even warm water at high pressure is not effective for removal of adhered oil. To remove oil from man-made structures for aesthetic reasons.
12. SLURRY SAND BLASTING	Use sandblasting equipment to remove oil from the substrate. May include recovery of used (oiled) sand in some cases.	When heavy oil residue is remaining on the shoreline, which needs to be cleaned for aesthetic reasons, and even hot-water wash is not effective.
13. VACUUM	Use of a vacuum unit with a suction head to recover free oil. Equipment ranges from small portable units to large super-suckers. Can be used with water spray systems to flush oil towards the suction head.	When free, liquid oil is stranded on the shoreline (usually along the high tide line) or trapped in vegetation that is readily accessible.

Method	Description	When to use
14. SEDIMENT REWORKING	Sediments are roto-tilled or otherwise mechanically mixed with the use of heavy equipment on gravel beds. The oiled sediments in the upper area may be relocated lower to enhance natural cleanup during reworking by wave activity (berm relocation).	On shorelines with significant amounts of subsurface oil, where sediment removal is infeasible (due to erosion concerns or disposal problems); also where surface oil deposits have started to form pavements or crusts.
15. SEDIMENT REMOVAL, CLEANSING AND REPLACEMENT	Oiled sediments are excavated using heavy equipment at low tide. The sediments are loaded into a container for cleansing process. Rinsed materials are returned to the original area. Cleaning equipment must be placed close to areas to reduce transportation problems.	Applicable on surfaces with large amounts of subsurface oil, where permanent removal of sediment is undesired and other cleanup techniques are likely to be ineffective.
16. CUTTING VEGETATION	Manual cutting of oiled vegetation using weed eater, and removal of cut vegetation with rakes. The cut vegetation is bagged immediately for disposal.	Use when the risk of oiled vegetation contaminating wildlife is greater than the value of the vegetation that is to be cut, and there is no less destructive method to remove or reduce the risk to acceptable levels.
17. CHEMICAL OIL STABILIZATION WITH ELASTOMERS	The primary purpose is to stabilize the oil, keeping it from spreading or escaping, causing oiling elsewhere. May reduce the solubility of the light (and more toxic) fractions, by locking them into the polymer. This reduces both air and water exposure. Depending on the beach type and equipment used, recovery may be enhanced.	When heavy concentrations of liquid oil are on the substrate and adjacent water body, and physical removal cannot be completed prior to the next tide so that the oil is likely to move to a more sensitive shoreline type. Should be used in conjunction with booming or other physical containment.
18. IN-SITU BURNING OF SHORELINES	Oil on the shoreline is burned, usually when it is on a combustible substrate such as vegetation, logs, and other debris. Oil can be burned off of nonflammable substrates with the aid of a burn promoter.	Early in the spill event, after ensuring that the product is ignitable.

Method	Description	When to use
19. NUTRIENT ENHANCEMENT	Nutrients are applied to the shoreline in one of several methods: soluble inorganic formulations that are dissolved in water and applied as a spray at low tide, requiring frequent applications; slow release formulations that are applied as a solid to the intertidal zone and designed to slowly dissolve; and oleophilic formulations that adhere to the oil itself, thus they are sprayed directly on the oiled areas.	On moderate to heavily oiled shorelines, after other techniques have been used to remove as much oil as possible; on lightly oiled shorelines where other techniques are not effective; and where nutrients are a limiting factor in natural degradation. Potentially for the treatment of subsurface oil.
20. MICROBIAL ADDITION	Formulations containing hydrocarbon-degrading microbes and fertilizers are added to the oiled area. To date, microbial addition has not been shown to work better than fertilizer alone in field tests.	N/A in shallow water, poorly flushed, restricted embayments, or where toxicity of nutrients (ammonia) is of concern. Use should be restricted adjacent to stream mouths, tide pool communities, etc. Other chemicals in the formulation could be toxic to aquatic organisms.

Appendix E-2

Shallow Water/Inland Response Strategies

SMALL LAKES AND PONDS				
Habitat Description	Lakes and ponds are standing bodies of water of variable size and water depth. Waves and currents are generally very low, although the water surface can become choppy. Water levels can fluctuate widely over time, particularly on manmade lakes. Smaller ponds can completely freeze over in winter. The bottom sediments close to shore can be soft and muddy, and the surrounding land can include wet meadows and marshes. Floating vegetation can be common. The rate of water exchange is highly variable within this group, ranging from days to years. These water bodies can include sections of a river with low flow rates (e.g., behind diversion dams) or that are somewhat isolated from regular flow (e.g., backwater lakes or oxbow lakes). Isolated water bodies, such as kettle lakes, are unique members of this category because they have no surface water outflow, and therefore have very low flushing rates. In shallow water, boat operations would be limited and most response operations would be conducted from shore.			
Sensitivity	Small lakes and ponds have medium to high sensitivity to oil spill impact because of low physical removal rates, limited dilution and flushing of oil mixed into the water column, and high biological and human use. They provide valuable habitat for migrating and nesting birds and mammals, and support important fisheries. Small lakes can be the focus of local recreational activities. Wind will control the distribution of slicks, holding the oil against a lee shore or spreading it along shore and into catchment areas. Wind shifts can completely change the location of slicks, contaminating previously clean areas. Thus, early protection of sensitive areas is important. The inlet and outlet are key areas for focusing protection efforts. Oil impacts on floating vegetation depend to a large degree on dose, with possible elimination of plants at high doses. Section 5 addresses sinking oils and response under ice conditions.			
Environmental impact from response methods for SMALL LAKE & POND environments.				
The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.				
Response Method	Gasoline Products	Diesel Products	Medium Oils	Heavy Oils
Booming - Deflection/Exclusion	A	A	A	A
Booming - Containment	-	A	A	A
Skimming/Vacuum	-	A	A	A
Sorbents	-	A	A	A
Natural Recovery	A	B	C	C
In-Situ Burning	B	B	B	B
Herding Agents	B	B	B	-
Debris Removal	-	B	B	B
Vegetation Removal	-	B	B	B
Physical Herding	C	B	B	B
Visco-Elastic Agents/Solidifiers	-	B	B	-
Manual Oil Removal/Cleaning	-	C	C	B
Mechanical Oil Removal	-	C	C	C
Dispersants	D	D	D	-
Emulsion Treating Agents	-	I	I	I
Nutrient Enrichment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: SMALL LAKE AND POND ENVIRONMENTS	
Least Adverse Habitat Impact	<i>Booming</i> • Use containment booms to keep oil from spreading • Safety concerns limit the containment of gasoline spills; however, booms can be used to exclude or deflect the spill away from sensitive resources <i>Skimming/Vacuum</i> • Not applicable to gasoline spills because of safety concerns • Land-based operations need site-specific restrictions and monitoring to minimize physical destruction <i>Sorbents</i> • Overuse results in excess waste generation • Inhibit the evaporation of gasoline spills
Some Adverse Habitat Impact	<i>Natural Recovery</i> • Low impact for light oils but may have significant impact for medium crudes and heavier fuel oils because they persist and affect shoreline habitats <i>In-Situ Burning</i> • Less environmental impact in winter when snow and ice provide some protection, plants are dormant, and fewer animals are present • Safety concerns limit containment of gasoline, but may be safely used with natural containment, such as gasoline trapped in ice <i>Herding Agents</i> • Most effective under calm conditions • Should be coupled with recovery when used to protect sensitive habitats • Not effective on heavy oils because oil must be fluid <i>Debris Removal</i> • Debris may be associated with nests or living areas (e.g., beaver lodges), so impacts on resident animal habitat may need consideration • Operate from small boats to minimize substrate disruption <i>Vegetation Removal</i> • If oil is trapped in floating vegetation, may be only way to recover the oil in the absence of water currents • May be appropriate to prevent secondary oiling of wildlife <i>Physical Herding</i> • Care should be taken not to drive oil into the water column or sediment <i>Visco-Elastic Agents/Solidifiers</i> • Visco-elastic agents, by improving overall oil recovery from the water surface, reduce secondary shoreline oiling • Not applicable to gasoline spills because of safety concerns during application and inhibition of evaporation • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil
Probable Adverse Habitat Impact	<i>Manual Oil Removal/Cleaning</i> • Inherent inefficiency of manual removal of fluid oils would require large crews or repeated entries, resulting in disruption to substrate and wildlife • Not applicable for gasoline spills because of safety concerns <i>Mechanical Oil Removal</i> • May be needed where oil has heavily contaminated bottom sediments • May require very intrusive recovery techniques
Most Adverse Habitat Impact	<i>Dispersants</i> • Inhibit the evaporation of gasoline spills • Shallow water depths and low dilution rates may result in high aquatic toxicity from oil/dispersant mixtures
Insufficient Information	<i>Emulsion-Treating Agents</i> • Not applicable to oils that do not form emulsions, such as gasoline • Insufficient toxicity data to evaluate environmental impact of shallow freshwater environment use <i>Nutrient Enrichment and Natural Microbe Seeding</i> • Not applicable to gasoline spills because they rapidly evaporate

	• There is insufficient information on impact and effectiveness for other oil types • There are special concerns about nutrient overloading in small, restricted water bodies

SMALL RIVERS AND STREAMS

Habitat Description	Small rivers and streams are characterized by shallow water (generally 1-2 meters) and narrow channels. Water flow can be highly variable, both throughout the seasons and with distance downstream. This grouping includes a wide range of water bodies, from fast-flowing streams with low falls and numerous rapids over bedrock and gravel, to slow-moving bayous bordered by low muddy banks and fringed with vegetation. Sections of the channel may be choked with log jams and debris, and mid-channel bars and islands can divide water flow into multiple channels. Both boat and vehicular access can be very limited; often the only access will be at bridge crossings. Ice may further complicate response measures in this habitat.
Sensitivity	Small rivers and streams have medium to high sensitivity to oil spill impact. Oil spills may have more of an impact on small rivers and streams than on large rivers due to a variety of conditions, such as lower flow conditions, lower dilution rates, lower overall energy, and greater range of natural habitats. Fish spawn in streams and the tributaries of larger rivers; thus, the most sensitive, early life stages can be present. Fringing wetlands and adjacent floodplains are closely connected to small rivers and streams, and they are areas of high biological use and low natural removal rates. Slicks usually contaminate both banks, and non-viscous oils are readily mixed into the entire water column in shallow streams, potentially exposing both aquatic and benthic organisms to oil. Initial weathering rates may be slower because spreading and evaporation are restricted in narrow channels and heavy vegetation cover. Fish kills are possible for spills ranging from gasoline to medium crude oils. Many different kinds of mammals, birds, reptiles, and amphibians use the stream bank habitats, and there can be localized high mortality rates of these animals. Spills can cause closure of water intakes for drinking water, irrigation, or industrial use along small rivers. A more aggressive response may be appropriate to prevent contamination of downstream habitat, particularly if water intakes, populated areas, or special habitat resources are present.

Environmental impact from response methods for SMALL RIVER & STREAM environments.

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

<i>Response Method</i>	<i>Gasoline Products</i>	<i>Diesel Products</i>	<i>Medium Oils</i>	<i>Heavy Oils</i>
Booming - Deflection/Exclusion	A	A	A	A
Skimming	A	A	A	A
Booming - Containment	-	A	A	A
Vacuum	-	A	A	A
Sorbents	-	A	A	A
Barriers/Berms	B	A	A	A
Physical Herding	B	B	B	B
Natural Recovery	A	B	C	C
Debris Removal	-	B	B	B
Visco-Elastic Agents/Solidifiers	B	B	B	-
Vegetation Removal	-	B	B	B
In-Situ Burning	C	B	B	B
Manual Oil Removal/Cleaning	-	C	C	B
Mechanical Oil Removal	-	C	C	C
Dispersants	D	D	D	-
Herding Agents	D	D	D	-
Emulsion Treating Agents	-	I	I	I
Nutrient Enrichment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: SMALL RIVER AND STREAM ENVIRONMENTS	
Least Adverse Habitat Impact	<i>Booming</i> • Used primarily to divert slicks towards collection points in low-current areas • Safety concerns limit the containment of gasoline spills; however, booms can exclude or deflect the spill away from sensitive resources • Expect low effectiveness with fast currents, shallow water, and steep banks <i>Skimming/Vacuum</i> • To protect public health and downstream resources where spreading is limited, recovery of large gasoline spills could be attempted with firefighting foam to suppress vapors and respiratory protection for workers <i>Sorbents</i> • Deploy in booms to recover sheens in low-current areas and along shore • Trampling of stream bank and bed habitats during deployment and recovery of sorbents can disrupt streamside vegetation and drive oil into the sediment • Overuse results in excess waste generation <i>Barriers/Berms</i> • Potential for physical disruption and sediment contamination in immediate area of the barrier/berm • If all or most of the flow is diverted, may need to monitor water requirements to habitats downstream of the barrier to mitigate potential impacts • Safety concerns limit actions at gasoline spills, although berms built ahead of the slick could be used to exclude oil from sensitive areas, such as side channels
Some Adverse Habitat Impact	<i>Physical Herding</i> • May be only means to flush oil trapped in log jams, beaver dams, behind rocks, and in vegetation/debris along banks to downstream collection areas • Spraying of gasoline spills can mix the oil into the water column <i>Natural Recovery</i> • For small gasoline and diesel-like oil spills, evaporation and natural dispersion would rapidly remove surface slicks • For all other types and sizes of spills, recovery of free or pooled oil and/or protection of sensitive resources should be attempted <i>Debris Removal</i> • Will release trapped oil and speed natural flushing rates • Visco-elastic agents may speed recovery of contained oil when time is critical • Solidifiers may immobilize even gasoline spills, preventing their transport downstream and further impact • Ineffective on heavy oils, which are too viscous to allow the product to mix into the oil <i>Vegetation Removal</i> • May be needed to remove oil trapped in floating and fringing vegetation • Remove oiled vegetation to prevent chronic sheening in sensitive areas or secondary oiling of wildlife • Monitor crews to minimize physical disturbance, which can be severe <i>In-Situ Burning</i> • May be difficult to protect stream-side vegetation • Safety concerns limit containment of gasoline, but may be safely used if natural containment is present • Less impact in winter when snow/ice provide some protection, plants are dormant, and fewer animals are present • May not be practical in fast flowing streams where containment and maintenance of minimum slick thickness (1-3 millimeters) may be difficult
Probable Adverse Habitat Impact	<i>Manual Oil Removal/Cleaning</i> • Viable for heavy oils that have solidified versus fluid oils that have spread • Stream bank disruption likely from movement of work crews <i>Mechanical Oil Removal</i> • Only consider when large amounts of solidified oil have accumulated in the stream channel and need to be removed quickly
Most Adverse Habitat	<i>Dispersants</i> • Enhanced mixing of oil into the water column with restricted dilution will increase acute toxicity to aquatic organisms <i>Herding Agents</i>

<i>Impact</i>	• Toxicity concerns when early life stages are present • May not be practical due to fast currents and rough water surface • Oil must be fluid, so not appropriate to heavy oils
<i>Insufficient Information</i>	<i>Emulsion-Treating Agents</i> • Insufficient toxicity data to evaluate environmental impact of shallow freshwater environment use • Not applicable to oils that do not form emulsions, such as gasoline <i>Nutrient Enrichment and Natural Microbe Seeding</i> • Not applicable to gasoline spills because they rapidly evaporate • There is insufficient information on impact and effectiveness, particularly for applications in small rivers and streams

MANMADE STRUCTURES (ESI = 1B, 6B, 8B)

Habitat Description	Manmade structures include vertical shore protection structures such as seawalls, piers, and bulkheads, as well as riprap revetments and groins, breakwaters, and jetties. Vertical structures can be constructed of concrete, wood, and corrugated metal. They usually extend below the water surface, although seawalls can have beaches or riprap in front of them. Riprap revetments are constructed of boulder-sized pieces of rock, rubble, or formed concrete pieces (e.g., tetrapods), placed parallel to the shoreline for shore protection. Riprap groins are oriented perpendicular to shore to trap sediment; jetties are designed to protect and maintain channels; and breakwaters are offshore structures constructed to protect an area from wave attack. Riprap structures have very large void spaces and are permeable, while seawalls and bulkheads have impermeable, solid substrates. These structures are very common along developed shores, particularly in harbors, marinas, and residential areas. The range in degree of exposure to waves and currents varies widely, from very low in dead-end canals, to very high on offshore breakwaters. Boat wakes can generate wave energy in otherwise sheltered areas.
Sensitivity	Manmade structures have a range of sensitivities to oil spills, depending on the degree of exposure to natural removal processes. Biological communities and use are sparse. Often, there are sources of pollutants or habitat degradation nearby, such as urban runoff, chronic small oil spills in marinas, poor water quality, and limited water circulation. More intrusive cleanup techniques are often conducted due to their lower biological use, higher public demand for oil removal for aesthetic reasons, and need to minimize human exposure to oil in populated areas. It is acknowledged that manmade structures can vary in permeability, cohesion, and mobility and, in turn, how they are affected by oiling. In this document, however, manmade structures have been grouped together so that the higher degree of cleanup often required can be adequately addressed. Vertical structures are generally impermeable to oil penetration, but oil can heavily coat rough surfaces, forming a band at the water line. During storms, oil can splash over the top and contaminate terrestrial habitats. Riprap poses significant cleanup problems because of large void spaces between the riprap and heavy accumulations of debris. Large amounts of oil can become trapped in the riprap, where it is difficult to remove and a potential source of sheening.

Environmental impact from response methods for MANMADE structures(ESI = 1B, 6B, 8B).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

<i>Response Method</i>	<i>Gasoline Products</i>	<i>Diesel Products</i>	<i>Medium Oils</i>	<i>Heavy Oils</i>
Manual Oil Removal/Cleaning	-	A	A	A
Debris Removal	-	A	A	A
High-Pressure, Cold-Water Flushing	B	A	A	B
Sorbents	B	A	A	B
Vacuum	-	B	A	A
Natural Recovery	A	A	B	B
Flooding	B	A	A	C
Low-Pressure, Cold-Water Flushing	B	A	A	C
Low-Pressure, Hot-Water Flushing	-	B	B	B
High-Pressure, Hot-Water Flushing	-	B	B	B
Shoreline Cleaning Agents	-	B	B	B
Solidifiers	B	B	B	-
In-Situ Burning	-	B	B	B
Nutrient Enrichment	-	C	C	D
Steam Cleaning	-	C	C	C
Chemical Shoreline Pretreatment	-	I	I	I

SAND HABITATS (ESI = 4)

Habitat Description	Sand habitats have a substrate composed of sediments that are predominantly finer than 2 millimeters but greater than silt or clay-sized material. The shoreline may consist of well-sorted sands of one principal size, or of poorly sorted mixtures of muddy sand, gravelly sand, or a combination of these two. When the sediments are fine-grained sand, beaches may be wide and flat; where the sediments are coarse-grained sand, they usually are steeper and narrower. Sandy shorelines may be naturally eroding, accreting, or stable, and groins or breakwaters may be placed to trap sand and maintain some beaches. Exposed sand beaches can undergo rapid erosional or depositional changes during storms. In developed areas, sand beaches can be artificially created by man and are commonly used for recreation. Sand bars and banks along rivers are also included in this habitat.
Sensitivity	Sand habitats have low to medium sensitivity to oil spills. They generally do not have sizable biological communities except where the habitat tends to be protected and consists of poorly sorted muddy sediments. Thus, ecological effects are likely to be of limited extent because of the low natural biological productivity. In developed areas, sand beaches are considered sensitive because of their high recreational use. During small spills, oil will concentrate in a band along the swash line. Maximum penetration into fine-grained sand will be less than 15 centimeters; penetration in coarse sand can reach 25 centimeters or greater. Clean sand can bury oiled layers quickly, creating more difficult cleanup issues. On heavily used recreational beaches, extensive cleanup is usually required to remove as much of the oil as possible. When large amounts of sediment must be removed, it may be necessary to replace these sediments with clean material. Traffic on sand can push oil deeper.

Environmental impact from response methods for SAND habitats (ESI = 4).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

<i>Response Method</i>	<i>Gasoline Products</i>	<i>Diesel Products</i>	<i>Medium Oils</i>	<i>Heavy Oils</i>
Debris Removal	-	A	A	A
Natural Recovery	A	A	B	B
Flooding	B	A	A	B
Sorbents	-	A	A	B
Manual Oil Removal/Cleaning	D	B	A	A
Mechanical Oil Removal	D	B	B	A
Low-Pressure, Cold-Water Flushing	B	B	B	B
Vacuum	-	B	B	B
Sediment Reworking	D	B	B	B
Nutrient Enrichment	-	B	B	C
Shoreline Cleaning Agents	-	-	B	B
Solidifiers	-	B	B	-
In-Situ Burning	-	-	B	B
Low-Pressure, Hot-Water Flushing	D	C	C	B
High-Pressure Hot-Water Flushing	D	D	D	D
High-Pressure, Cold-Water Flushing	D	D	D	D
Chemical Shoreline Pretreatment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: SAND HABITATS	
Least Adverse Habitat Impact	<i>Debris Removal</i> • Degree of oiling that warrants debris removal and disposal depends on use by humans and sensitive resources <i>Natural Recovery</i> • Lower impact for small spills, lighter oil types, and remote areas <i>Flooding</i> • Only effective when the oil is fluid and on the sand surface, rather than penetrated or buried • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats <i>Sorbents</i> • Not applicable to gasoline spills because they rapidly evaporate • Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents • Overuse results in excess waste generation
Some Adverse Habitat Impact	<i>Manual Oil Removal/Cleaning</i> • Minimizes sediment removal and problems of erosion and waste disposal • Effective when oil is mostly on the surface, not buried beneath clean sand • Gasoline tends to quickly evaporate; therefore habitat disruption, worker safety concerns, and waste generated by manual cleanup are not balanced by benefits in removing oil <i>Mechanical Oil Removal</i> • Tends to remove large amounts of clean sand with the oiled sand • Use on high-use beaches where rapid removal of oil is required and where long stretches of shoreline are heavily oiled • Gasoline tends to quickly evaporate; therefore habitat disruption, worker safety concerns, and waste generated from mechanical cleanup are not balanced by benefits in removing oil <i>Low-Pressure, Cold-Water Flushing</i> • Only effective when the oil is fluid and adheres loosely to the sediments • Optimize pressure to minimize the amount of sand washed downslope <i>Vacuum</i> • Early use of vacuum on pooled, liquid oil can prevent deeper penetration • Will minimize amount of sorbent waste when used with flushing efforts • Can vacuum heavy, non-sticky oil from sand substrates completely, but slowly <i>Sediment Reworking</i> • Appropriate for lightly oiled and stained sediments, to speed removal rates, and as a final step to polish recreational beaches • Because gasoline tends to quickly evaporate, habitat disruption, worker safety concerns, and waste generated from sediment reworking are not balanced by benefits in removing oil <i>Nutrient Enrichment</i> • Potentially effective for lighter oils that leave thin residues; less effective for thick, weathered oil residues • May be concern about nutrient overloading in poorly flushed areas • Not applicable to gasoline spills because they rapidly evaporate <i>Shoreline Cleaning Agents</i> • May be only technique to remove viscous oils without removing sediment • Individual products vary in their toxicity and ability to recover the treated oil <i>Solidifiers</i> • Not applicable to gasoline spills because they rapidly evaporate • Early use may prevent pooled oil from penetrating deeper • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil <i>In-Situ Burning</i> • Can effectively remove pooled surface oil accumulations • Concerns about air pollution, physical nature of the residue, and thermal impact on biota • May have to dig trenches to accumulate oil in pools • Lighter oils will penetrate the sand, leaving insufficient surface concentrations to burn
Probable Adverse Habitat	<i>Low-Pressure, Hot-Water Flushing</i> • May be needed to soften and lift sticky oil off the sand surface • Any organisms present will be adversely affected by hot water

<i>Impact</i>	
<i>Most Adverse Habitat Impact</i>	<i>High-Pressure, Cold-Water Flushing And High-Pressure, Hot-Water Flushing</i> • High-pressure water jets will fluidize sand-sized sediments, erode the beach, and wash the oiled sediment into nearshore habitats
<i>Insufficient Information</i>	<i>Chemical Shoreline Pretreatment</i> • More information needed on available products, their effectiveness, and impact <i>Natural Microbe Seeding</i> • There is insufficient information on impact and effectiveness in freshwater habitats

MIXED SAND AND GRAVEL HABITATS (ESI = 3, 5)

Habitat Description	Mixed sand and gravel habitats are characterized by a substrate that is composed predominantly of a mixture of sand- to cobble-sized sediments. These habitats may vary from a well-sorted cobble layer overlying finer-grained (sand-sized) sediments to mixtures of sand, pebble, and cobble. Typically, well-sorted beaches are exposed to some wave or current action that separates and transports finer-grained sediments; however, the sediment distribution does not necessarily indicate the energy at a particular shoreline. On depositional beaches multiple berms can be formed at the different water levels generated during storms. In glaciated areas, the gravel component can include very large boulders. Natural replenishment rates are very slow for gravel, compared to sand. Mixed sand and gravel habitats occur as beaches along the Great Lakes and as point bars along rivers and streams.
Sensitivity	Mixed sand and gravel habitats have medium sensitivity to oil spills. Biological communities are very sparse because of sediment mobility, desiccation, and low organic matter. Most invertebrates living in this habitat are deep burrowers, such as some oligochaete worms and insect larvae. Characteristic insects are mayflies, stoneflies, caddisflies, and midges, although mayflies and stoneflies are scarce or absent where silt is present. The nearshore habitat is used by fish for spawning and protects fry and larvae. There are also limited numbers of birds and mammals. Viscous oils reaching these habitats may not penetrate into the sediments because the pore spaces between sediments are filled with sand. Therefore, deep oil penetration and long-term persistence are lower than on gravel substrates. However, oil can still occur at depths below those of annual reworking, particularly if the oil is deposited high on the beach out of the reach of normal wave activity or is rapidly buried. Erosion can be a concern when large quantities of sediment are physically removed. In more sheltered areas, asphalt pavements can form if heavy surface oil deposits are not removed. Once formed, these pavements are very stable and can persist for years.

Environmental impact from response methods for MIXED SAND and GRAVEL habitats (ESI = 3, 5).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

<i>Response Method</i>	<i>Gasoline Products</i>	<i>Diesel Products</i>	<i>Medium Oils</i>	<i>Heavy Oils</i>
Debris Removal	-	A	A	A
Flooding	A	A	A	C
Natural Recovery	A	A	B	B
Low-Pressure, Cold-Water Flushing	B	A	A	B
Sorbents	-	A	A	B
Vacuum	-	B	B	B
Manual Oil Removal/Cleaning	D	B	A	A
Sediment Reworking	D	B	B	B
Mechanical Oil Removal	D	C	B	B
Shoreline Cleaning Agents	-	-	B	B
Nutrient Enrichment	-	B	B	C
In-Situ Burning	-	-	B	B
Solidifiers	-	-	B	-
High-Pressure, Cold-Water Flushing	C	C	C	C
Low-Pressure, Hot-Water Flushing	D	C	C	B
High-Pressure, Hot-Water Flushing	D	C	C	C
Steam Cleaning	-	D	D	D
Chemical Shoreline Pretreatment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: MIXED SAND AND GRAVEL HABITATS	
Least Adverse Habitat Impact	<i>Debris Removal</i> • Degree of oiling that warrants debris removal and disposal depends on amount of use by humans and sensitive resources <i>Flooding</i> • Most effective when the oil is fluid and adheres loosely to the sediments • Use on heavy oils is likely to leave large amounts of residual oil in the environment <i>Natural Recovery</i> • Least impact for small spills, lighter oil types, and remote areas <i>Low-Pressure, Cold-Water Flushing</i> • Most effective when the oil is fluid and adheres loosely to the sediments • Excessive pressures can cause erosion • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats <i>Sorbents</i> • Overuse generates excess waste • Useful for recovering sheens, even for gasoline spills • Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents
	<i>Vacuum</i> • Early use of vacuum on pooled, liquid oil can prevent deeper penetration <i>Manual Oil Removal/Cleaning</i> • Gasoline tends to evaporate quickly; therefore manual cleanup causes habitat disruption, worker safety concerns, and generates waste with no benefits due to removing oil • Minimizes sediment removal and problems of erosion and waste disposal • Preferable when oil is mostly on the surface, not deeply penetrated or buried <i>Sediment Reworking</i> • Use to break up heavy surface oil or expose persistent subsurface oil deposits, particularly where sediment removal will cause erosion • Use where there is sufficient exposure to waves to rework the sediments into their original profile and distribution • Gasoline tends to evaporate quickly; therefore sediment reworking causes habitat disruption, worker safety concerns, and generates waste with no benefits due to removing oil <i>Mechanical Oil Removal</i> • Tends to remove large amounts of sediment with the oil • Applicable for heavier oil types, which are difficult to remove otherwise • Gasoline tends to evaporate quickly; therefore mechanical cleanup causes habitat disruption, worker safety concerns, and generates waste with no benefits from removing oil <i>Shoreline Cleaning Agents</i> • May be only technique to remove viscous oils without removing sediment • Individual products vary in their toxicity and ability to recover the treated oil <i>Nutrient Enrichment</i> • Not applicable to gasoline spills because they rapidly evaporate • Potentially effective for lighter oils that leave thin residues; less effective for thick, weathered oil residues • Most applicable as a secondary technique after gross oil removal • Concerns about nutrient overloading in poorly flushed areas <i>In-Situ Burning</i> • Can effectively remove pooled surface oil accumulations • Concerns about air pollution, physical nature of the residue, and thermal impact on biota • May have to dig trenches to accumulate oil in pools • Lighter oils will not remain on the sediment surface <i>Solidifiers</i> • Early use may prevent pooled oil from penetrating deeper • Not applicable to gasoline spills because they rapidly evaporate • May be useful in recovering sheens when deployed as booms and pillows • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil.

Probable Adverse Habitat Impact	<i>High-Pressure, Cold-Water Flushing</i> • High-pressure water jets will flush oiled sediments into nearshore habitats • Excessive pressures can cause erosion if large amounts of sand are present <i>Low-Pressure, Hot-Water Flushing</i> • Any organisms present will be affected by hot water • Use on gasoline spills may transport the oil to more sensitive habitats
Most Adverse Habitat Impact	<i>High-Pressure, Hot-Water Flushing</i> • Will flush oiled sand into nearshore zone and affect any organisms present <i>Steam Cleaning</i> • Highly intrusive technique; will kill any organisms present • Potential for released oil to penetrate deeper into the sediments
Insufficient Information	<i>Chemical Shoreline Pretreatment</i> • Need more information on available products, their effectiveness, and impact <i>Natural Microbe Seeding</i> • There is insufficient information on impact and effectiveness in freshwater habitats

GRAVEL HABITATS (ESI = 6A)

Habitat Description	Gravel habitats are characterized by a substrate that is composed predominantly of gravel-sized sediments. By definition, gravel includes sediments ranging in size from granules (greater than 2 millimeters) to boulders (greater than 256 millimeters). The sand fraction on the surface is usually less than ten percent, although the sand content can increase to 20 percent with depth. These sediments are highly permeable because there are few sand-sized sediments to fill the pore spaces between the individual gravel particles. Gravel substrates may also have low bearing capacity and, consequently, may not support vehicular traffic. Typically, well-sorted beaches are exposed to some wave or current action that reworks the sediments and removes the finer-grained sediments. However, the sediment distribution does not necessarily indicate the energy setting at a particular shoreline; sheltered beaches can still have a large gravel source. In glaciated areas, the gravel can include very large boulders. On depositional beaches, zones of pure pebbles or cobbles can form into multiple berms at the different water levels generated during storms. Gravel shorelines tend to be steeper than those composed of sand or mud. Natural replenishment rates are very slow for gravel compared to sand. Gravel habitats occur as beaches along the Great Lakes and as bars along rivers and streams.
Sensitivity	Gravel habitats have medium sensitivity to oil spills. Biological communities are very sparse because of sediment mobility, desiccation, and low organic matter. Characteristic insects are mayflies, stoneflies, caddisflies, and midges, all with larvae living among the sediments. Flatworms, leeches, and crustaceans may be found on the gravel undersides. The nearshore habitat is used by fish for spawning and provides protection for fry and larvae. Gravel habitats are ranked higher in sensitivity than sand and gravel habitats because deep penetration of stranded oil into the permeable substrate is likely. Oil can penetrate to depths below those of annual reworking, resulting in long-term persistence of the oil. The slow replenishment rate makes removing oiled gravel highly undesirable. Also, formation of persistent asphalt pavements is likely where there is high accumulation of persistent oils.

**Environmental impact from response methods for GRAVEL habitats
(ESI = 6A).**

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

<i>Response Method</i>	<i>Gasoline Products</i>	<i>Diesel Products</i>	<i>Medium Oils</i>	<i>Heavy Oils</i>
Debris Removal	-	A	A	A
Low-Pressure, Cold-Water Flushing	A	A	A	B
Flooding	A	A	A	C
Natural Recovery	A	A	B	B
Sorbents	-	A	A	B
Vacuum	-	B	B	B
High-Pressure, Cold-Water Flushing	C	B	B	B
Nutrient Enrichment	-	B	B	C
Manual Oil Removal/Cleaning	D	B	B	A
Sediment Reworking	D	B	B	B
Shoreline Cleaning Agents	-	-	B	B
In-Situ Burning	-	-	B	B
Solidifiers	-	-	B	-
Low-Pressure, Hot-Water Flushing	D	C	C	B
Mechanical Oil Removal	D	D	C	C
Steam Cleaning	-	D	D	D
Chemical Shoreline Pretreatment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: GRAVEL HABITATS	
Least Adverse Habitat Impact	<i>Debris Removal</i> • Degree of oiling that warrants debris removal and disposal depends on use by humans and sensitive resources <i>Low-Pressure, Cold-Water Flushing</i> • Only effective when the oil is fluid and loosely adheres to the sediments • Usually used in conjunction with vacuum and sorbents • Use on heavy oils is likely to leave large amounts of residual oil in the environment <i>Flooding</i> • Only effective when the oil is fluid and adheres loosely to the sediments • Usually used with various flushing techniques • Use on heavy oils is likely to leave large amounts of residual oil in the environment <i>Natural Recovery</i> • Least impact for small spills, lighter oil types, remote areas, and eroding areas <i>Sorbents</i> • Overuse generates excess waste • Useful for recovering sheens, even for gasoline spills • Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents
Some Adverse Habitat Impact	<i>Vacuum</i> • Early use of vacuum on pooled, liquid oil can prevent deeper penetration <i>High-Pressure, Cold-Water Flushing</i> • High-pressure water jet is likely to flush finer sediments into nearshore submerged habitats • Very viscous oils will require extremely high pressure to mobilize them <i>Nutrient Enrichment</i> • Not applicable to gasoline spills because they rapidly evaporate • Concerns about nutrient overloading in poorly flushed areas or where nutrient toxicity, especially ammonia, might be significant • Potentially effective for lighter oils that leave thin residues; less effective for thick, weathered oil residues <i>Manual Oil Removal/Cleaning</i> • Gasoline tends to quickly evaporate; therefore manual cleanup causes habitat disruption, worker safety concerns, and generates waste with no benefits from removing oil • Minimizes sediment removal and problems of erosion and waste disposal • Deep penetration of oil in porous gravel reduces effectiveness <i>Sediment Reworking</i> • Used where gravel removal is not feasible because of erosion concerns • Sufficient exposure to waves is required to rework the sediments into their original profile and distribution • Gasoline tends to evaporate quickly; therefore sediment reworking causes habitat disruption, worker safety concerns, and generates waste with no benefits from removing oil <i>Shoreline Cleaning Agents</i> • May be only technique to remove viscous oils without removing sediment or using hot-water flushing • Individual products vary in their toxicity and ability to recover the treated oil <i>In-Situ Burning</i> • Can effectively remove pooled surface oil accumulations • May have to dig trenches to accumulate oil in pools • Lighter oils will not remain on the sediment surface • Concerns about air pollution, physical nature of the residue, and thermal impact on biota <i>Solidifiers</i> • Early use may prevent pooled oil from penetrating deeper • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil • May be useful in recovering sheens when deployed as booms and pillows

Probable Adverse Habitat Impact	<i>Low-Pressure, Hot-Water Flushing</i> • May be needed to flush viscous or deeply penetrated oil • Any organisms present will be adversely affected by hot water <i>Mechanical Oil Removal</i> • Likely to remove large amounts of gravel with the oil • Foot and vehicular traffic on gravel could mix oil deeper into the sediments
Most Adverse Habitat Impact	<i>High-Pressure, Hot-Water Flushing</i> • High-pressure water jets are likely to flush oiled sediments into nearshore submerged habitats • Any organisms present will be adversely affected by hot water and high pressure <i>Steam Cleaning</i> • Highly intrusive technique; will kill any organisms present • Potential for released oil to penetrate deeper into the porous sediments
Insufficient Information	<i>Chemical Shoreline Pretreatment</i> • Need more information on available products, their effectiveness, and impact <i>Natural Microbe Seeding</i> • There is insufficient information on impact and effectiveness in freshwater habitats

VEGETATED SHORELINE HABITATS (ESI = 9A)

Habitat Description	Vegetated shoreline habitats consist of the non-wetland vegetated banks that are common features of river systems and lakes. Bank slopes may be gentle or steep, and the vegetation consists of grasses, bushes, or trees common to the adjacent terrestrial habitats. The substrate is not water-saturated and can range from clay to gravel. The banks may flood seasonally and are exposed to relatively high-energy removal processes, at least periodically. Along undeveloped shorelines, there can be leafy litter and woody debris trapped among the vegetation. In developed areas, yards and gardens may abut the lake or river.
Sensitivity	Vegetated shoreline habitats are considered to have medium to high sensitivity to oil spills. They are not particularly important habitats for sensitive animals and plants, although many animals use vegetated banks for drinking, washing food, crossing bodies of water, and feeding. Bank plants oiled during a flood period could be susceptible, especially if the flood rapidly subsides, allowing oil to penetrate into bank sediments and to contact root systems. Small plants, particularly annuals, are likely to be most damaged. Stranded oil could remain in the habitat until another flood reaches the same level and provides a mechanism for natural flushing. On steep banks, the oil is likely to form a band, or multiple bands, at the waterline. On gentle banks, there is a greater potential for oil to accumulate in pools, penetrate the substrate, and coat large areas of vegetation, thus raising the issue of shoreline cleanup. In developed urban and suburban areas, human use and aesthetics would be the main reasons for cleanup.

Environmental impact from response methods for VEGETATED SHORELINE habitats (ESI = 9A).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

<i>Response Method</i>	<i>Gasoline Products</i>	<i>Diesel Products</i>	<i>Medium Oils</i>	<i>Heavy Oils</i>
Natural Recovery	A	A	B	B
Flooding	B	A	A	B
Low-Pressure, Cold-Water Flushing	B	A	A	B
Sorbents	-	A	B	B
Manual Oil Removal/Cleaning	D	B	B	B
Debris Removal	-	B	B	B
Vacuum	-	B	B	B
Vegetation Removal	D	B	B	B
Nutrient Enrichment	-	B	B	B
In-Situ Burning	-	B	B	B
High-Pressure, Cold-Water Flushing	D	C	C	D
Mechanical Oil Removal	D	C	C	C
Low-Pressure, Hot-Water Flushing	D	D	D	D
High-Pressure, Hot-Water Flushing	D	D	D	D
Sediment Reworking	D	D	D	D
Sorbents	-	B	B	B
Chemical Shoreline Pretreatment	-	I	I	I
Shoreline Cleaners	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: VEGETATED SHORELINE HABITATS	
Least Adverse Habitat Impact	<i>Natural Recovery</i> • Low impact for small or moderate-size spills and lighter oils • More impact for large spills of medium - or high-viscosity oils <i>Flooding</i> • Operationally difficult and marginally effective for steep banks • Appropriate for gentle banks where persistent oil has pooled, assuming that the released oil can be directed towards recovery devices or sorbents • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats <i>Low-Pressure, Cold-Water Flushing</i> • Effective for washing oil stranded on the banks into the water for recovery • Vegetation cover minimizes the potential for sediment erosion from flushing • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats
Some Adverse Habitat Impact	<i>Sorbents</i> • Useful for recovering sheens, even for gasoline spills • Physical removal rates of medium and heavy oils will be slow, so less oil will be mobilized for recovery by sorbents • Overuse generates excess waste <i>Manual Oil Removal/Cleaning</i> • Some mixing of oil into the substrate and trampling of vegetation is unavoidable with foot traffic in oiled areas • Gasoline tends to quickly evaporate; therefore habitat disruption, worker safety concerns, and waste generated by manual cleanup are not balanced by benefits in removing oil <i>Debris Removal</i> • Degree of oiling that warrants debris removal and disposal depends on use by humans and sensitive resources • Minimal concerns where substrate is firm or work is conducted from boats <i>Vacuum</i> • Potential damage where substrate will not support vehicular traffic • Most effective where access is good and substrate can support vehicles • Only useful when oil is pooled <i>Vegetation Removal</i> • Usually not necessary to reduce oil impact on vegetation • May be required in areas used by sensitive animals <i>Nutrient Enrichment</i> • Applicable where nutrients are a limiting factor for oil degradation • More effective after gross oil removal is completed • Not applicable to gasoline spills because they rapidly evaporate <i>In-Situ Burning</i> • May be the least physically damaging means of oil removal from the banks • Least impact for grassy areas versus banks covered with trees and shrubs
Probable Adverse Habitat Impact	<i>High-Pressure, Cold-Water Flushing</i> • High-pressure water spray will disturb plants and erode sediments • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats <i>Mechanical Oil Removal</i> • Excessive physical disruption likely from use of equipment

<i>Most Adverse Habitat Impact</i>	<i>Low-Pressure, Hot-Water Flushing</i> • Hot water could kill plants and potentially erode and degrade habitat <i>High-Pressure, Hot-Water Flushing</i> • Combination of high pressure and hot water poses high risk of sediment and vegetation loss <i>Sediment Reworking</i> • Will result in extensive habitat disruption <i>Solidifiers</i> • Not applicable to gasoline spills because they rapidly evaporate • Application of loose particulates may impede removal of oil mixed with, and adhered to, vegetation, litter, and debris • May be useful in recovering sheens when deployed as booms and pillows • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil or penetrate netting or fabric encasing the loose particulates
<i>Insufficient Information</i>	<i>Chemical Shoreline Pretreatment</i> • There is insufficient information on impact and effectiveness in freshwater vegetation <i>Shoreline Cleaning Agents</i> • More information needed on available products, their effectiveness, and impact of use on vegetated bank habitats • Individual products vary in their toxicity and ability to recover the treated oil <i>Natural Microbe Seeding</i> • There is insufficient information on impact and effectiveness in freshwater vegetated shorelines

MUD HABITATS (ESI = 9B)

Habitat Description	Mud habitats are characterized by a substrate composed predominantly of silt and clay sediments, although they may be mixed with varying amounts of sand or gravel. The sediments are mostly water saturated and have low bearing strength. In general, mud shorelines have a low gradient, although some steep banks also may consist of mud. The mud habitats generally are low energy and sheltered from wave action and high currents. Adjacent nearshore areas are usually shallow with muddy sediments. These fine-grained habitats often are associated with wetland. Bare or sparsely vegetated mud substrates are rare along Great Lake shorelines. However, they commonly occur along river floodplains and lake bottoms, where they can be exposed during seasonal low water levels.
Sensitivity	Mud habitats are highly sensitive to oil spills and subsequent response activities. Shoreline sediments are likely to be rich in organic matter and support an abundance of infauna. Muddy habitats are important feeding grounds for birds and rearing areas for fish. Oil will not penetrate muddy sediments because of their low permeability and high water content, except through decaying root and stem holes or animal burrows. There can be high concentrations and pools of oil on the surface. Natural removal rates can be very slow, chronically exposing sensitive resources to the oil. The low bearing capacity of these shorelines means that response actions can easily leave long-lasting imprints, cause significant erosion, and mix the oil deeper into the sediments. When subsurface sediments are contaminated, oil will weather slowly and may persist for years. Response methods may be hampered by limited access, wide areas of shallow water, fringing vegetation, and soft substrate.

Environmental impact from response methods for MUD habitats (ESI= 9B).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

<i>Response Method</i>	<i>Gasoline Products</i>	<i>Diesel Products</i>	<i>Medium Oils</i>	<i>Heavy Oils</i>
Natural Recovery	A	A	A	B
Flooding	B	A	A	A
Sorbents	B	A	A	B
Debris Removal	-	B	B	B
Vacuum	-	C	B	B
In-Situ Burning	C	C	C	C
Low-Pressure, Cold-Water Flushing	D	C	C	C
Manual Oil Removal/Cleaning	D	D	C	C
Low-Pressure, Hot-Water Flushing	D	D	C	C
Solidifiers	D	D	C	-
Mechanical Oil Removal	D	D	D	D
High-Pressure, Cold-Water Flushing	D	D	D	D
High-Pressure, Hot-Water Flushing	D	D	D	D
Sediment Reworking	D	D	D	D
Shoreline Cleaning Agents	-	D	D	D
Natural Microbe Seeding	-	I	I	I
Nutrient Enrichment	-	I	I	I
Chemical Shoreline Pretreatment	I	I	I	I

RESPONSE METHODS: MUD HABITATS	
Least Adverse Habitat Impact	<i>Natural Recovery</i> • Least impact for small spills and lighter oils, to prevent disruptions associated with cleanup efforts • For large spills or heavy oils, expect long-term persistence in low-energy settings <i>Flooding</i> • Effective only for fresh, fluid oils • Local topography may limit the ability to control where the water and released oil flow and effectiveness of recovery • Use on gasoline spills may transport the oil to more sensitive habitats <i>Sorbents</i> • Useful as long as the oil is mobilized and recovered by the sorbent • Overuse generates excess waste • Careful placement and recovery is necessary to minimize substrate disruption
Some Adverse Habitat Impact	<i>Debris Removal</i> • Degree of oiling that warrants debris removal and disposal depends on use by sensitive resources • Extensive disruption of soft substrate likely <i>Vacuum</i> • Not applicable to gasoline spills because of safety concerns • Use to remove oil pooled on the surface • Avoid digging trenches to collect oil because they can introduce oil deeper into the sediment • Disruption of soft substrates can be limited by placing boards on the surface and controlling access routes
Probable Adverse Habitat Impact	<i>In-Situ Burning</i> • Heat may impact biological productivity of habitat, especially where there is no standing water to act as a heat sink on top of the mud <i>Low-Pressure, Cold-Water Flushing</i> • Mud is readily suspended if substrate is not firm • Not effective for higher-viscosity oils that will not move with low pressure • Local topography may limit the ability to control where the water and released oil flow and effectiveness of recovery • Use on gasoline spills may transport the oil to more sensitive habitats <i>Manual Oil Removal/Cleaning</i> • Use where persistent oil occurs in moderate to heavy amounts, or where sensitive resources must be protected • Response crews may trample soft substrates, mix oil deeper into the sediments, and contaminate clean areas <i>Low-Pressure, Hot-Water Flushing</i> • Physical and thermal impacts to habitat likely

<i>Most Adverse Habitat Impact</i>	<i>Solidifiers</i> • High likelihood of disruption and mixing of oil deeper into the substrate during application and retrieval • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil <i>Mechanical Oil Removal</i> • Soft substrate will not support vehicular traffic • Will probably cause extensive physical habitat disruption <i>High-Pressure, Cold-Water Flushing and High-Pressure, Hot-Water Flushing</i> • High-pressure water will cause extensive sediment suspension and erosion • Potential for burial of oiled sediments and transport of oil to adjacent areas <i>Sediment Reworking</i> • Will extensively disrupt physical habitat • Increases oil penetration, burial, and persistence <i>Shoreline Cleaning Agents</i> • Current products are designed for use with high-pressure flushing; since used with flushing, water pressure needs to be considered • Individual products vary in their toxicity and ability to recover the treated oil
<i>Insufficient Information</i>	<i>Natural Microbe Seeding and Nutrient Enrichment</i> • Not applicable to gasoline spills because they rapidly evaporate • There is insufficient information on impact and effectiveness in mud habitats <i>Chemical Shoreline Pretreatment</i> • There is insufficient information about direct toxicity of the products, disturbances resulting from application and retrieval, effectiveness, and net benefit

WETLAND HABITATS (ESI = 10A, 10B)

Habitat Description	Wetlands are characterized by water, unique soils that differ from adjacent upland areas, and vegetation adapted to wet conditions. Wetlands include a range of habitats such as marshes, bogs, bottomland hardwood forests, fens, playas, prairie potholes, and swamps. Substrate, vegetation, hydrology, seasonality, and biological use of inland wetlands are highly variable, making characterization difficult. The surfaces of wetlands usually have a low gradient and vegetated areas are typically at or under the water level. There can be distinct channels or drainages with flowing water, except at the exposed outer fringe; however, natural physical processes are minimal. Water levels may vary seasonally, and the wetland may be simply a zone of water-saturated soils during the dry season.
Sensitivity	Wetlands are highly sensitive to oil spills. The biological diversity in these habitats is significant and they provide critical habitat for many types of animals and plants. Oil spills affect both the habitat (vegetation and sediments) and the organisms that directly and indirectly rely on the habitat. Surprisingly little is known about oil impact on freshwater plants, although there are likely differences between robust perennials with substantial underground systems and cycles of winter die-back, and annuals that lack underground nutrient reserves. Detritus-based food webs are fundamentally important in wetlands; oil could possibly affect these by slowing decomposition rates of plant material. Wetlands support populations of fish, amphibians, reptiles, birds, and mammals, with many species reliant upon wetlands for their reproduction and early life stages when they are most sensitive to oil. Many endangered animals and plants occur only in wetlands, and spills in such areas would be of particular conservation concern. Migratory waterbirds depend heavily on wetlands as summer breeding locations, migration stopovers, and winter habitats. The threat of direct oiling of animals using the wetland often drives efforts to remove the oil. If oil and/or cleanup efforts causes a loss of the more sensitive plants or modifies the ecosystem structure, then feeding and breeding of dependent wildlife may be affected.

Environmental impact from response methods for WETLAND habitats (ESI = 10A, 10B).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

<i>Response Method</i>	<i>Gasoline Products</i>	<i>Diesel Products</i>	<i>Medium Oils</i>	<i>Heavy Oils</i>
Natural Recovery	A	A	A	B
Sorbents	C	A	A	A
Flooding	B	A	A	B
Low-Pressure, Cold-Water Flushing	B	A	A	B
In-Situ Burning	B	B	B	B
Vacuum	-	B	B	B
Debris Removal	-	B	B	B
Vegetation Removal	D	C	C	C
Manual Oil Removal/Cleaning	D	D	C	C
High-Pressure, Cold-Water Flushing	D	D	D	D
Low-Pressure, Hot-Water Flushing	D	D	D	D
High-Pressure, Hot-Water Flushing	D	D	D	D
Mechanical Oil Removal	D	D	D	D
Sediment Reworking	D	D	D	D
Solidifiers	D	D	D	-
Shoreline Cleaning Agents	-	I	I	I
Nutrient Enrichment	-	I	I	I
Natural Microbe Seeding	-	I	I	I
Chemical Shoreline Pretreatment	-	I	I	I

RESPONSE METHODS: WETLAND HABITATS	
Least Adverse Habitat Impact	<i>Natural Recovery</i> • Least impact for small to moderate spills and lighter oils; avoids damage often associated with cleanup activities • Some cleanup may be warranted where large numbers of animals are likely to become oiled during wetland use <i>Sorbents</i> • Care is necessary during placement and recovery to minimize disturbance of substrate and vegetation • Overuse generates excess waste <i>Flooding</i> • Erosion of substrate and vegetation may be a problem • Can be used selectively to remove localized heavy oiling • Can be difficult to direct water and oil flow towards recovery devices • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats <i>Low-Pressure, Cold-Water Flushing</i> • If water pressures are too high, the substrate and vegetation may be disturbed • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats
Some Adverse Habitat Impact	<i>In-Situ Burning</i> • May be one of the least physically damaging means of heavy oil removal • Presence of a water layer on marsh surface can protect roots • Time of year (vegetation growth stage) is important consideration • May be appropriate for gasoline spills trapped in ice <i>Vacuum</i> • Can be effective in removal of pooled oil from the marsh surface • Trampling of vegetation and substrate can be limited by placing boards on the surface and limiting traffic <i>Debris Removal</i> • The removal of heavily oiled and mobile debris may reduce the tracking of oil off-site and contamination of wildlife
Probable Adverse Habitat Impact	<i>Vegetation Removal</i> • Used to prevent oiling of sensitive animals using the wetland • Most appropriate for oils that form a thick, sticky coating on the vegetation, such as medium and heavy oils • May delay recovery of the vegetation due to both oil impact and physical destruction by cleanup crews • Trampling of vegetation may be reduced by controlling access routes, using boards placed on surface, or conducting operations from boats <i>Manual Oil Removal/Cleaning</i> • Used where persistent oil occurs in heavy amounts and where sensitive resources using the wetlands are likely to be oiled • Response crews may trample roots and mix oil deeper into the sediments
Most Adverse Habitat Impact	<i>High-Pressure, Cold-Water Flushing</i> • High-pressure spray will disrupt sediments, root systems, and animals <i>Low-Pressure, Hot-Water Flushing and High-Pressure, Hot-Water Flushing</i> • Hot water will likely kill the vegetation <i>Mechanical Oil Removal</i> • Using vehicles in soft substrate will probably cause extensive physical disruption • Can completely alter the marsh substrate, hydrology, and vegetation patterns for many years • Use in heavily oiled wetlands when all other techniques have failed and there is an overriding reason for oil removal <i>Sediment Reworking</i> • No benefit from mixing oil deeper into fine-grained and organic soils <i>Solidifiers</i> • Not applicable to gasoline spills because they rapidly evaporate

	• Use likely to increase adherence to vegetation and slow weathering/removal rates of residual oil • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil
<i>Insufficient Information</i>	<i>Shoreline Cleaning Agents</i> • More information needed on available products, their effectiveness, and impact of use on vegetated bank habitats • Individual products vary in their toxicity and recoverability of the treated oil <i>Nutrient Enrichment and Natural Microbe Seeding</i> • Not applicable to gasoline spills because they rapidly evaporate • Concerns include eutrophication and acute toxicity, particularly from ammonia, because of shallow waters and low mixing rates • There is insufficient information on impact and effectiveness in wetlands <i>Chemical Shoreline Pretreatment</i> • There is insufficient information about product toxicity, disturbances resulting from application and retrieval, effectiveness, and net benefit

Appendix F

SMT Activity Checklists

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1. Incident Commander

The Incident Commander is responsible for the overall management of the incident. The Incident Commander directs incident activities, including development and implementation of strategic decisions and approves ordering and releasing of resources.

- ? A. Call Incident Management Team (IMT) Section Chiefs to Incident Command Post.
 - ___ 1. Distribute Incident Report and brief IMT regarding the incident.
 - ___ 2. Ensure Command Staff and Section Chief positions are filled.
- ? B. Assess/discuss the situation. Establish immediate priorities.
 - ___ 1. Safety of personnel (field, responders, surrounding population) and Site Safety Plan development
 - ___ 2. Source control
 - ___ 3. Agency notifications
 - ___ 4. Off-site impact
 - ___ 5. Identification and protection of sensitive areas
 - ___ 6. Continued surveillance of the situation
 - ___ 7. Determine response strategies.
- ? C. Initiate internal/external notification process
- ? D. Conduct Planning/Assessment meetings on a regular basis.
 - ___ 1. Evaluate and adjust strategic and tactical objectives, as well as response priorities based upon input from IMT and Government agencies.
 - ___ 2. Relay critical information to appropriate Sections and IMT.
- ? E. Coordinate IAP development based upon objectives and priorities identified.
- ? F. Implement a Unified Command System with agency responders, if requested.
 - ___ 1. Determine location of the Incident Command Post and which IMT members need to mobilize if necessary.
- ? G. Approve requests for additional resources and for release of resources.
- ? H. Decide on the use of trainees, volunteers, and auxiliary personnel.
- ? I. Review the accuracy of information prior to release to the public. Be available for technical, incident-related questions, if necessary.
- ? J. Review and approve written reports prior to submittal to regulatory agencies.
- ? K. Coordinate with Finance Section Chief to:
 - ___ 1. Develop and review delegations of authority and expenditure approval limits.

1. Incident Commander

___ 2. Provide effective accounting, cost control and office support functions for the response operation.

- ? L. Provide relief personnel for essential IMT assignments.
- ? M. Seek appropriate legal counsel.
- ? N. Order the demobilization of the incident when appropriate.

2. Safety Officer

The Safety Officer is responsible for monitoring and assessing hazardous and unsafe situations, in addition to developing measures for assurance of personnel safety.

- ? A. Obtain briefing from Incident Commander.
 - ___ 1. Coordinate Search and Rescue Operations.
 - ___ 2. Follow up on evacuated personnel until they reach safe harbor. Consider:
 - ___ a. Debrief Team
 - ___ b. Drug testing, if appropriate
 - ___ 3. Contact contractor for safety support, if necessary.
- ? B. Consider safety of personnel at site, responders and surrounding population.
 - ___ 1. Establish Safety Zone as necessary.
 - ___ 2. Evaluate and monitor the following:
 - ___ a. Oxygen levels
 - ___ b. Explosive character
 - ___ c. Toxicity of the air on scene
 - ___ d. Splash and ingestion hazards
 - ___ 3. Determine if offset operators or public could be affected by the incident.
- ? C. Ensure the preparation and implementation of a Site Safety Plan.
 - ___ 1. Establish First Aid Posts.
 - ___ 2. Conduct Safety Inspections.
 - ___ 3. Verify personnel have correct PPE.
 - ___ 4. Monitor personnel for conformance with Site Safety Plan.
- ? D. Assist Service Branch Director (Logistics) with Medical Plan, if requested.
- ? E. Ensure response operations are conducted in compliance with safety requirements.
- ? F. Exercise emergency authority to stop and prevent unsafe acts, if necessary.
- ? G. Develop and issue safety bulletins, alerts, etc. on issues affecting or likely to affect worker safety.
- ? H. Investigate, report and record safety-related accidents that occur during response operations. Develop remedial actions to avoid future occurrences.
- ? I. Demobilize as ordered.
- ? J. Assist with investigation of cause of incident.

3. Liaison Officer

The Liaison Officer notifies Government agencies of incident and remains the point of contact for personnel assigned to the incident from assisting or cooperating agencies.

- ? A. Obtain briefing from Incident Commander.
- ? B. Notify Government Agencies as outlined.
 - ___ 1. Record names of agency personnel notified
 - ___ 2. Record time/date of each call, and appropriate incident # assigned to the incident.
(ICS Notification Status Report)
 - ___ 3. Advise each agency that you will be the Responsible Party Contact.
 - ___ 4. Respectfully request review of all public statements prior to issuance by agencies, in order to ensure accuracy of data.
- ? C. Request agencies issue the following:
 - ___ 1. One mile Safety Zone in water
 - ___ 2. Five mile Safety Zone in air
 - ___ 3. Notice to Mariners (if offshore)
- ? D. Identify representatives from each agency, including communications link and location.
- ? E. If requested by Planning Section Chief, contact Government agencies for response approval.
- ? F. Participate in planning meetings. Provide current agency resource status information.
- ? G. Prepare "Initial" written reports to agencies as required. Obtain approval from Legal Officer and Incident Commander prior to submittal to agencies.
- ? H. Work with Logistics Section Chief to arrange tours and briefings for elected officials, if appropriate.
- ? I. After response operations cease, obtain composite log from Documentation Unit Leader and prepare final written reports to agencies as required. Obtain approval from Incident Commander and Legal Officer prior to submittal to agencies.

4. Information Officer

The Information Officer is responsible for developing and releasing information about the incident to the news media, incident personnel, as well as other appropriate agencies and organizations.

- ? A. Obtain briefing and special instructions from Incident Commander
- ? B. Establish procedures for handling media relations and distribute guidelines to the Incident Management Team.
- ? C. Notify joint partners of incident.
 - ___ 1. Update partners on regular basis.
- ? D. Establish a single information center with agencies. This may be called the Joint Information Center (JIC).
 - ___ 1. Gather information.
 - ___ 2. Resolve conflicting information
 - ___ 3. Staff telephone banks to accept and respond to media queries.
 - ___ 4. Prepare staff for walk-in questions and contacts.
- ? E. Arrange for necessary work space, materials, telephones, and staffing.
- ? F. Obtain copies of current incident reports.
- ? G. Counsel the Incident Commander on expected media interest, how media may perceive data.
- ? H. Identify community concerns.
 - ___ 1. Prepare for response to phoned in citizens' questions
 - ___ 2. Provide speakers to citizen groups as necessary and/or requested.
 - ___ 3. Hold informational public meetings as deemed necessary.
 - ___ 4. Track community attitudes. Advise Incident Commander and address problems as needed.
- ? I. Prepare public statements, press releases and information on the incident. Obtain approval from Incident Commander before releasing information.
 - ___ 1. Prepare Incident Commander for his role as chief spokesman.
 - ___ 2. Observe constraints on the release of information imposed by Incident Command.
- ? J. Prepare and disseminate news releases and Fact Sheets.
 - ___ 1. Use recording devices when talking to media.
- ? K. Attend planning and briefing meetings to update information releases.
- ? L. Plan and execute news conferences between media and incident personnel.
- ? M. Work with Logistics Section Chief to organize media visits to operational sites, if necessary (or appropriate).
 - ___ 1. Provide escort service and ensure media personnel / VIPs

4. Information Officer

have proper PPE.

- ? N. Select, retain and supervise public relations specialists as needed.
- ? O. Respond to special requests for information.
- ? P. Maintain a record of newspaper articles, radio and television broadcasts, press conferences and briefings. Submit the record to Documentation Unit Leader.
- ? Q. Ensure conflicting information is resolved, and bring media concerns to Incident Commander
- ? R. Demobilize as ordered.

5. Legal Officer

The Legal Officer is responsible for reviewing and advising the Incident Commander regarding matters pertinent to any liability, admission, or actions assumed or taken during incident response.

- ? A. Obtain briefing and special instructions from Incident Commander.
- ? B. Determine applicability of laws, legal exposures and appropriate legal defense strategies.
- ? C. Ensure that representatives of the Legal Department are available to de-brief field personnel on events leading up to incident.
- ? D. Determine company's legal relationship with all involved parties.
- ? E. Advise Documentation Unit Leader regarding data gathered and preserved relevant to defense or settlement of future claims or litigation.
- ? F. Determine photographic recording requirements.
- ? G. Assist the Information Officer and the Finance Section Chief.
- ? H. Prepare responses to inquiries, claims and other legal matters.
- ? I. Assist Finance with issuance of public advertisements, if required.
- ? J. Prepare summary reports examining legal situation, key issues associated with the incident. Determine options and courses of action to be followed.
- ? K. Review contracts prior to execution as required.
- ? L. Provide the Incident Commander with legal advice on response and mitigation techniques, as appropriate.
- ? M. Ensure contract response personnel are cognizant of communications restriction to outside agencies, the media, environmental groups and the general public.

6. Human Resources Officer

The Human Resources Officer is responsible for reviewing and advising the Incident Commander regarding matters pertinent to any personnel issue during an incident response.

- ? A. Obtain briefing and special instructions from Incident Commander
- ? B. In the event of personnel injuries or fatalities:
 - ___ 1. If it is a company employee, initiate and maintain contact with the injured person(s) and their family.
 - ___ 2. If it is Contractor personnel, initiate and maintain contact with their employer.
 - ___ 3. Ensure that the name(s) of the injured or deceased WILL NOT BE released until families have been notified.
- ? C. Coordinate volunteer requests and activities.
 - ___ 1. Support of volunteers (coordinate with Logistics):
 - ___ a. Berthing
 - ___ b. Food while at work location
 - ___ c. Personal protective equipment
 - ___ d. Medical assistance
 - ___ e. Transportation
 - ___ f. Training
 - ___ 2. Maintain a record of all volunteers:
 - ___ a. Names
 - ___ b. Addresses and phone numbers
 - ___ c. Assignments
 - ___ d. Training received
- ? D. Coordinate Drug and Alcohol testing, if instructed to do so by the Incident Commander.
- ? E. Evaluate temporary personnel requirements.
- ? F. Coordinate establishing a "Spouse" hotline for responders.

7. Operations Section Chief

The Operations Section Chief activates and supervises tactical response operations in the field. He activates and executes the Site Safety Plan.

- ? A. Obtain briefing and special instructions from Incident Commander, regarding:
 - ___ 1. Status of incident
 - ___ a. Assist with personnel safety.
 - ___ b. Notify offset operators.
 - ___ c. Notify affected pipeline companies.
 - ___ 2. Objectives
 - ___ 3. Resources already called out
- ? B. Send representative to field.
- ? C. Establish surveillance program.
 - ___ 1. Track incident by use of small aircraft, helicopter, crew boat and/or supply vessels.
 - ___ 2. Work with Logistics Section Chief to obtain resources necessary to support surveillance ops, including aircraft, maps, and communications equipment.
 - ___ 3. Advise Planning Section of status as appropriate.
- ? D. Contact response organizations to discuss strategy, availability and location of equipment. Mobilize equipment and personnel. Advise contract personnel of the following:
 - ___ 1. Type of product involved; health/safety hazards associated with product
 - ___ 2. Location of the MSDS(s); details of the Site Safety Plan
 - ___ 3. Location of the first aid station
 - ___ 4. Personal protection equipment required
 - ___ 5. Potential environmental and physical hazards
 - ___ 6. Job tasks and objectives
- ? E. Contact response contractors to discuss mobilization of resources if required.
- ? F. Obtain samples of spilled material if requested.
- ? G. Work with Consultants to develop and implement response strategies.
- ? H. Request resources needed to implement the Operations tactics as part of the Incident Action Plan development.
- ? I. Identify shoreline sites for immediate pre-cleaning. Requisition personnel to conduct pre-cleaning operations.
- ? J. Participate in planning meetings as required.
- ? K. Supervise the execution of the Incident Action Plan for Operations.
- ? L. Coordinate operations with those conducted by Government agencies.

7. Operations Section Chief

? M. Make or approve expedient changes to the Incident Action Plan during the operational period as necessary. ? N. Submit daily summary for each location to Situation Unit Leader. ? O. Work with Planning to de-mobilize equipment not in use. ? P. Assist in investigating the cause of the incident and the effectiveness of the incident response operations. ? Q. Provide relief for essential employee assignments. ? R. Do not use collecting agent or dispersant without express approval from the Incident Commander.	

8. Staging Area Manager

The Staging Area Manager is responsible for managing all activities within the designated staging areas.

? A. Obtain briefing from Operations Section Chief. ? B. Identify appropriate sites for staging areas: ___ 1. Offshore equipment ___ 2. Well control equipment ___ 3. Shoreline / Inland equipment ___ 4. Dispersant operations ___ 5. Wildlife rehab center ___ 6. Decontamination area ? C. Work with Logistics to identify appropriate facilities for Staging Areas. ? D. As requested by Incident Commander, provide information on Staging Area(s) (i.e., sq. footage, parking, access to public, etc.). ? E. Post signs, prepare maps for identification. ? F. Establish check-in/check-out function as appropriate. ___ 1. Maintain a record of equipment, materials and supplies received/assigned. ___ 2. Maintain a record of persons checking in/checking out at Staging Area. (ICS 211) ? G. Demobilize or reposition staging areas as needed.	

9. Planning Section Chief

The Planning Section Chief is responsible for the collection, evaluation, dissemination and use of information about the development of the incident and use of resources. Information is needed to 1) understand the current situation, 2) predict probable course of incident events, and 3) determine available strategies for the incident.

- ? A. Obtain briefing from Incident Commander.
- ? B. Activate Planning Section Units as necessary to support planning needs.
 - ___ 1. Request trajectories from J. Connor Consulting.
 - ___ 2. Determine sensitive areas.
 - ___ 3. Consider available strategies.
 - ___ 4. Gather/display incident information.
- ? C. Consider submission for dispersant approval.
- ? D. Collect and process situation information about the incident.
 - ___ 1. Monitor Situation Status Report prepared by Situation Unit Leader.
- ? E. Prepare ICS 201/202.
- ? F. Supervise preparation of the Incident Action Plan, if required.
- ? G. Develop short range and long range tactical plans.
- ? H. Participate in Planning and other meetings as required.
- ? I. Establish information requirements and reporting schedules for all ICS organizational elements for use in preparing the Incident Action Plan.
- ? J. Call out and assign Technical Specialists where needed.
 - ___ 1. Legal Specialist
 - ___ 2. Resources at Risk (RAR) Technical Specialists
 - ___ 3. Trajectory Analysis Specialist
 - ___ 4. Sampling Specialist
 - ___ 5. Responder Training Specialist
 - ___ 6. Disposal (Waste Management Specialist)
 - ___ 7. Alternative Response Technologies (ART) Specialist
- ? K. Assemble information on available strategies.
- ? L. Provide periodic predictions on incident potential.
- ? M. Prepare and distribute orders from Incident Command.
- ? N. Instruct Planning Section Units in distribution and routing of incident information.
- ? O. Ensure that information collection and reporting requirements are being met.
- ? P. Prepare recommendations for release of resources for submission to members of Incident Command.
- ? Q. Maintain Section records.
- ? R. Demobilize in accordance with the Demobilization Plan.

10. Situation Unit Leader

The Situation Unit Leader is responsible for the collection and evaluation of information about the current and possible future status of the incident and the incident response operations.

? A. Obtain briefing and special instructions from the Planning Section Chief ? B. Collect, maintain and display data for duration of incident. ___ 1. Weather, surveillance, trajectory. ___ 2. Maps depicting incident area, spill trajectories. ___ 3. Provide updated incident surveillance data to trajectory Specialist as necessary. ? C. Collect, maintain and display incident response data including: ___ 1. Incident Report. ___ 2. Frequently used phone numbers. ___ 3. Maps depicting response operations, staging areas, and other information as necessary. ___ 4. Coordinate with appropriate Response Team Personnel to gather information for Incident Status Reports and Equipment Status Board. ___ a. Status of manpower and equipment resources currently assigned, available and/or out of service. ___ b. Maps showing environmentally sensitive areas, protection strategies ___ c. Status of oily waste management operations, including quantity of oil spilled and quantity of oil, oily water, and debris recovered ___ d. Status of shoreline impacts ? D. Prepare the Incident Status Summary (ICS 209). ? E. Provide status reports to appropriate requesters.	

11. Resource Unit Leader

The Resource Unit Leader is responsible for maintaining the status of all resources (primary and support) at an incident. This unit is also responsible for preparing parts of the Incident Action Plan (ICS 203, 204), compiling the entire plan in conjunction with other members of the ICS, (e.g. Situation Unit, Operations, Logistics) and determining the availability of resources.

- ? A. Obtain briefing and special instructions from the Planning Section Chief.
- ? B. Establish check-in function for equipment and personnel at incident locations.
- ? C. Prepare and maintain the Command Post display organization chart and resource allocation and deployment sections of display)
- ? D. Establish contacts with incident facilities by telephone, electronic means or fax and begin maintenance of resource status.
- ? E. Gather, post, and maintain incident resource status.
- ? F. Maintain master roster of all resources checked in at the incident.
- ? G. Prepare Organization Assignment List (ICS 203) and ICS Organization Chart.
- ? H. Prepare appropriate parts of assignment lists (ICS 204).
- ? I. Provide status reports to appropriate requesters.

12. Documentation Unit Leader

The Documentation Unit Leader is responsible for the maintenance of accurate, up-to date incident files. The Documentation Unit also provides duplication and copying services.

- ? A. Obtain briefing and special instructions from the Planning Section Chief.
- ? B. Work with the Financial Section Chief, Planning Section Chief, Command Staff and Incident Commander to develop special documentation guidelines for use by appropriate response personnel. Distribute guidelines.
- ? C. Assist Incident Commander in maintaining accurate records of incident response decisions and actions.
- ? D. Record the incident as it develops and identify, in detail, the actions taken, resources committed, and any problems encountered. The format of this report shall be as follows:
 - ___ 1. Summary of Events – A chronological narrative of all events, including:
 - ___ a. The location of the incident.
 - ___ b. The cause of the incident.
 - ___ c. The initial situation.
 - ___ d. Efforts to initiate response.
 - ___ e. The organization of the response, including Government participation.
 - ___ f. The resources committed.
 - ___ g. Treatment/disposal/alternative technology approaches pursued and followed.
 - ___ h. Public information/community relations activities.
 - ___ i. All directives or major actions instituted by Incident Commander.
 - ___ 2. Effectiveness of Mediation Actions by:
 - ___ a. Company
 - ___ b. Government and local forces
 - ___ c. Government agencies and special teams
 - ___ d. Contractors, private groups, and volunteers
 - ___ 3. Difficulties encountered – A list of problems affecting response.
 - ___ 4. Recommendations:
 - ___ a. Means to prevent a recurrence of the incident.
 - ___ b. Improvement of response actions.
 - ___ c. Any recommended changes in the Emergency Response Plan.
 - ___ 5. The following will be included as enclosures to the report:
 - ___ a. Maps, charts, photographs, or diagrams of the

12. Documentation Unit Leader

areas affected by the incident. ___ b. Radio, telephone, and other applicable logs. ___ c. Photographic documentation of the response, arranged chronologically. ___ d. Any other documentation necessary to supplement information in the report. ___ 6. A copy of this report shall be forwarded to the Incident Commander. ? E. Establish and organize incident files. ? F. Establish duplication service and respond to requests. ? G. File copies of all official forms, reports and news articles. ? H. Maintain a file for newspaper articles, radio and television broadcasts, press conferences and briefings as provided by Information Officer. ? I. Provide incident documentation to appropriate requesters. Obtain approval from Incident Commander before release of information.	

13. Technical Specialists

Technical Specialists are advisors with special skills needed to support the incident and may be assigned anywhere in the ICS organization. If necessary, Technical Specialists may be formed into a separate unit. The Planning Section will maintain a list of available specialists and will assign them where needed.

The following are example position descriptions for Technical Specialists that might be utilized during an oil spill response.

- ? A. Resources at Risk (RAR) Technical Specialists are responsible for the identification of resources thought to be at risk from exposure to the spilled oil through the analysis of known and anticipated oil movement and the location of natural, cultural, and economic resources. The RAR Technical Specialists consider the relative importance of the resources and the relative risk to develop a priority list for protection.
- ? B. The Trajectory Analysis Specialist is responsible for providing to the Unified Command projections and estimates of the movement and behavior of the spill. The specialist will combine visual observations, remote sensing information, computer modeling as well as observed and predicted tidal, current and weather data to form these analyses. Additionally, the specialist is responsible for interfacing with local experts (weather service, academia, researchers, etc.) in formulating these analyses. Trajectory maps, overflight maps, tides and current data, and weather forecasts will be supplied by the specialist to the Situation Unit for dissemination throughout the Command Post.
- ? C. The Natural Resource Damage Assessment (NRDA) Representative is responsible for coordinating NRDA needs and activities as they relate to ICS spill response operations. This includes close coordination with the trustee team for advising timely information on the spill and injuries to natural resources. Consult with Legal Specialist(s) and contact the trustees for possible coordination of NRDA or injury determination activities.
- ? D. The Sampling Specialist(s) are responsible for sampling plans for the coordinated collection, documentation, storage, transportation and submittal to appropriate laboratories for analysis or storage as is appropriate of samples collected at spill sites.
- ? E. The Responder Training Specialist(s) ensures implementation of training assignments, monitors operational procedures, and evaluates training needs.
- ? F. The Disposal (Waste Management) Specialist is responsible for providing the Planning Section Chief with a Disposal Plan that details the collection, sampling, monitoring, temporary storage, transportation, and disposal of all anticipated response wastes.
- ? G. The Alternative Response Technologies (ART) Specialist(s) is responsible for evaluating the opportunities to use ART, including dispersant or other chemical counter measures, in-situ burning, and bioremediation. The specialist(s) will conduct the consultation and planning required to deploy a specific ART, and articulate the

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13. Technical Specialists

environmental tradeoffs of using or not using a specific ART.

14. Logistics Section Chief

The Logistics Section Chief is responsible for all of the services and support needs of an incident, including obtaining and maintaining essential personnel, facilities, equipment and supplies as requested by, or in support of Incident Commander, Operations and/or Planning.

- ? A. Obtain briefing from Incident Commander.
- ? B. Locate and mobilize equipment, personnel and transportation as requisitioned by IMT.
- ? C. Identify service and support requirement for planned and expected operations.
 - ___ 1. Advise Operations of types and capabilities of on-site equipment, personnel, and material assets.
 - ___ 2. Advise Operations of characteristics and capabilities of available equipment, personnel, and material assets.
 - ___ 3. Inform Operations of logistics shortfalls.
 - ___ 4. Inform Operations of assets received into/released out of operating area.
 - ___ 5. Communicate directly with contractors in the field to identify and resolve logistics requirements.
 - ___ 6. Support decontamination, reconstitution, and redeployment of equipment resources.
- ? D. Provide input to and review Communications Plan (ICS 205), and Medical Plan (ICS 206).
- ? E. Review Incident Action Plan and estimate Section needs for next operational period.
- ? F. Ensure Incident Communications Plan is prepared.
- ? G. Prepare service and support elements of the Incident Action Plan.
- ? H. Receive Demobilization Plan from Planning Section.
- ? I. Recommend release of unit resources in conformance with Demobilization Plan.

15. Service Branch Director

The Service Branch Director, when activated, is under the supervision of the Logistics Section Chief, and is responsible for the management of all service activities at the incident including Communication, Medical, Food, Housing, Fueling, Water, Sanitation facilities, and Security.

- ? A. Obtain briefing from Logistics Section Chief.
- ? B. Determine level of service required to support operations.
 - ___ 1. Prepare Medical Emergency Plan (ICS 206).
 - ___ 2. Personnel
 - ___ a. Provide field personnel with food and drink.
 - ___ b. Secure lodging.
 - ___ c. Assure sufficient potable water.
 - ___ d. Stock additional clothing.
 - ___ e. Provide restrooms, decontamination.
 - ___ 3. Security
 - ___ a. Arrange for security at the following locations:
 - Spill site
 - Field operations sites
 - Staging area(s)
 - Warehouse(s)
 - Wildlife rescue center(s)
 - Other facilities, as necessary
 - Provide executive protection as required
 - ___ b. Obtain and supervise contract security personnel. Coordinate security operations with local law enforcement.
 - ___ c. Establish a procedure to ensure rapid access to secured facilities for authorized personnel and vehicles.
 - ___ d. Maintain a record of all visitors to secured facilities.
- ? C. Assign work locations and preliminary work tasks to Section personnel.
- ? D. Provide input to and review Communications Plan, Medical Plan, Traffic Plan and Vessel Routing Plan.
- ? E. Coordinate and process requests for additional resources.
- ? F. Review Incident Action Plan and estimate Section needs for next operational period.
- ? G. Advise on current service and support capabilities.
- ? H. Prepare service and support elements of the Incident Action Plan.
- ? I. Estimate future service and support requirements.
- ? J. Receive Demobilization Plan (ICS 221) from Planning Section.
- ? K. Recommend release of unit resources in conformance with Demobilization Plan.

16. Support Branch Director

The Support Branch Director, when activated, is under the direction of the Logistics Section Chief, and is responsible for development and implementation of logistics plans in support of the Incident Action Plan, including providing personnel, equipment, facilities, and supplies to support incident operations.

- ? A. Obtain briefing from Logistics Section Chief.
- ? B. Determine initial support operations in coordination with Logistics Section Chief and Service Branch Director.
- ? C. Source and mobilize response equipment as requisitioned. OPS Section Chief may have made an initial call out of equipment – Do not duplicate.
- ? D. Source and mobilize trained personnel.
 - ___ 1. Only trained personnel are authorized to perform containment and cleanup operations.
 - ___ 2. Determine:
 - ___ a. Number of personnel available
 - ___ b. Where are they coming from
 - ___ c. Estimated time to arrive at staging area
 - ___ d. Transportation necessary to get to staging area
 - ___ 3. Maintain information on all contract personnel:
 - ___ a. Date contracted
 - ___ b. Work performed
 - ___ c. Work location
 - ___ d. Training records
 - ___ e. Compensation rate/amount
 - ___ f. Date released
- ? E. Source and mobilize transportation.
 - ___ 1. Motor vessels
 - ___ 2. Utility boats
 - ___ 3. Crew boats
 - ___ 4. Tug boats
 - ___ 5. Jackup boats for housing
 - ___ 6. Storage barges for temporary disposal
 - ___ 7. Aircraft for transporting IMT cleanup personnel, surveillance and spotter.
- ? F. Provide transportation for moving personnel and equipment from the staging area to the incident site. This may include:
 - ___ 1. Helicopters
 - ___ 2. Airplanes, amphibious aircraft
 - ___ 3. Vessels
 - ___ 4. Cars, vans, trucks
- ? G. As needed, provide transportation services at the spill site for

16. Support Branch Director

operations such as wildlife rescue, surveillance, salvage, waste disposal, etc.

- ? H. Track movement of equipment, personnel, and material resources deploying to, operating within, and deploying from staging area. Maintain Equipment Status Board and provide as required to Situation Unit Leader.
- ? I. Manage equipment maintenance (scheduled/unscheduled) capability including spare parts inventory, mechanics.
- ? J. Coordinate availability of remote sensing capability.
- ? K. Maintain ready access to load limit information for aircraft and airfields. Ensure that adequate and appropriate loading/ unloading equipment is available.
- ? L. Locate and activate Staging Areas, Field Command Posts, Incident Command Center, Wildlife Rehab Centers with Staging Area Manager (Ops).
 - ___ 1. Set up Command Center considering the following:
 - ___ a. Telephones and service
 - ___ b. Radios
 - ___ c. Sewage / wastewater
 - ___ d. Catering
 - ___ e. Video equipment
 - ___ f. Computers
 - ___ g. Tables / Chairs
 - ___ h. Consider Media Room separate from main Command Center
 - ___ i. Consider Mobile Offices
 - ___ j. Parking
 - ___ k. Electrical service
 - ___ l. Security
 - ___ m. Helicopter landing pad
 - ___ n. Documentation forms
 - ___ o. Case logbooks
 - ___ p. Status board
 - ___ q. Charts / maps / reference publications
 - ___ r. Briefing area
 - ___ 2. Provide services, i.e. lighting, portable generators, heaters.
 - ___ 3. Advise IMT of the following:
 - ___ a. Name of facility
 - ___ b. Address
 - ___ c. Phone number
 - ___ d. Description
 - ___ e. Written directions to location.
- ? M. If requested, arrange for video and photographic documentation of area before, during and post response. Obtain a helicopter for photographer and coordinate with Operations Section Chief.
- ? N. Determine if assigned Branch resources are sufficient.

16. Support Branch Director

? O. Maintain surveillance of assigned unit work progress and inform Logistics Section Chief of activities.	

17. Communications Unit Leader

The Communications Unit Leader is responsible for developing plans for the effective use of incident communications equipment and facilities; installing and testing of communications equipment; supervision of the incident communications equipment; distribution of communications equipment to incident personnel; and the maintenance and repair of communications equipment.

- ? A. Obtain briefing from Service Branch Director or Logistics Section Chief.
- ? B. Determine level of service required to support operations. Source and mobilize as necessary:
 - ___ 1. Setup field communications.
 - ___ 2. Establish Incident Communications Center and Message Center.
 - ___ 3. Setup phone system in Command Center.
 - ___ 4. Maintain radio logs.
 - ___ 5. Ensure accountability for communications equipment (log).
- ? C. Advise communications capabilities/limitations.
- ? D. Prepare and implement the incident Communications Plan (ICS 205).
- ? E. Prepare telephone directory.
- ? F. Initiate request to FCC for temporary radio frequencies.
- ? G. Determine requirements and provide communications equipment for Security personnel.
- ? H. Implement request to establish 800 number access for Claims and Public Relations.
- ? I. Establish appropriate communications distribution/maintenance locations.
- ? J. Ensure communications systems are installed and tested.
- ? K. Ensure an equipment accountability system is established.
- ? L. Distribute communications plans to field personnel.
- ? M. Ensure personal portable radio equipment is distributed per radio plan.
- ? N. Recover equipment from relieved or released units and decon as necessary.

18. Finance Section Chief

The Finance Section Chief is responsible for all financial and cost analysis aspects of the incident and for supervising members of the Finance Section.

- ? A. Obtain briefing from Incident Commander.
- ? B. Attend planning meeting to gather information on overall strategy.
- ? C. Establish AFE # for response.
- ? D. Identify and order supply and support needs for Finance
- ? E. Develop and operating plan for the Finance Section
 - ___ 1. Ensure that a system is in place to properly manage the financial aspects of equipment acquisition and to account for expenditures.
 - ___ 2. Coordinate invoice verification, appropriate charge coding and system input for complete processing and payment.
 - ___ 3. Work with the Logistics Section Chief to coordinate needs for purchase orders, verification of receipts, invoices, and special payments.
 - ___ 4. Establish a cash working fund and activate a special checking account for required manual payments and local requirements.
- ? F. Prepare work objectives for subordinates, brief staff, make assignments, and evaluate performance.
- ? G. Inform members of the Unified Command and General Staff when Section is fully operational.
- ? H. Meet with assisting cooperating agency representatives as required.
- ? I. Provide input in all planning sessions on financial and cost analysis matters.
- ? J. Participate in all demobilization planning.

19. Procurement Unit Leader

The Procurement Unit Leader is responsible for administering all financial matters pertaining to vendor contracts.

- ? A. Obtain briefing from Finance Section Chief.
- ? B. Contact appropriate unit leaders on incident needs and any special procedures.
- ? C. Coordinate with local jurisdictions on plans and supply sources.
- ? D. Develop Incident Procurement Plan.
- ? E. Prepare and sign contracts and land use agreements as needed.
- ? F. Establish contracts with supply vendors as required.
- ? G. Interpret contracts/agreements and resolve claims or disputes within delegated authority.
- ? H. Coordinate with Compensation/Claims Unit on procedures for handling claims.
- ? I. Finalize all agreements and contracts.
- ? J. Coordinate use of cash funds as required.
- ? K. Complete final processing of invoices and send documents for payment.
- ? L. Coordinate cost data in contracts with Cost Unit Leader.

20. Compensation/Claims Unit Leader

The Compensation/Claims Unit Leader is responsible for the overall management and direction of all Compensation for Injury Specialist and Claims Specialists assigned to the incident.

- ? A. Obtain briefing from Finance Section Chief.
- ? B. Establish contact with incident Safety Officer and Liaison Officer or Agency Representatives if no Liaison Officer is assigned.
- ? C. Prepare responses to inquiries, claims and other legal matters.
- ? D. Issue Public Advertisements as required.
- ? E. Determine the need for Compensation for Injury and Claims Specialists and other personnel if needed.
- ? F. Obtain a copy of the Incident Medical Plan.
- ? G. Periodically review all logs and forms produced by Compensation/Claims Specialists to ensure that entries are thorough, accurate, timely, and in compliance with requirements and policies.
- ? H. Keep Finance Section Chief briefed on unit status and activity.
- ? I. Demobilize unit in accordance with Demobilization Plan.
- ? J. Coordinate insurance claims processing.
- ? K. Notify appropriate insurance underwriters.
 - ___ 1. Determine insurance coverage limits and estimated insurance recovery of incident response costs.
 - ___ 2. Supervise processing and investigation activities for claims.
 - ___ 3. Determine documentation requirements with underwriters.
- ? L. Maintain claims data to include settlement costs, number of claims, and potential future indemnities.
- ? M. Establish claims office and hotline if necessary.

21. Cost Unit Leader

The Cost Unit Leader is responsible for collecting all cost data, performing cost effectiveness analyses, and providing cost estimates and cost saving recommendations for the incident.

? A. Obtain briefing from Finance Section Chief. ? B. Obtain and record all cost data. ? C. Prepare incident cost summaries. ? D. Prepare resources-use cost estimates for Planning. ? E. Make recommendations for cost savings to Finance Section Chief. ? F. Maintain cumulative incident cost records. ? G. Ensure that all costs documents are accurately prepared. ? H. Complete all records prior to demobilization. ? I. Provide reports to Finance Section Chief.	

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Abnormal Incident Report
(To Be Completed By Operator)

Name	Social Security Number	Age	Incident Date	Time		AM PM
Description of incident: Describe work being done prior to incident and how the incident happened.						
Describe all facts, conditions, or other factors which you think caused the incident.						
In your opinion, what can you do to prevent this type of accident in the future?						
Signature			Job classification		Date	
To Be Completed by Supervisor						
Name			Date			AM PM
Date you were notified	Time you were notified		AM PM	Investigation: Did incident result in shutdown?		
Was operations at time of incident normal?			Was special task being done?			
What mechanical, physical, or environmental conditions were present at the time of the incident?						
List persons in or near area at the time of the incident.						
What action of operator contributed to incident?						
How did the incident occur?						
List any loss of production.						
List action taken to prevent recurrence of similar incident.						
Operator's full name		Field location		Date		
Length of company service		Length of time in present job		Number of previous incidents		
How many of the previous incidents resulted in:						
No lost production:			Lost Production:			
Incident location	Incident date	Day of week		Time		AM PM
Reviewed by Manager						
Signature				Date		

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Spill Report Form
(Page 1 of 2)

☐ Drill ☐ Actual Spill		NRC Number: _____	
Responsible Party	Reporting party:		Suspected responsible party:
	Name: _____		Company: _____
	Phone: _____		Phone: _____
	Company: _____		Address: _____
	Address: _____		_____
Time and Location	Date/time incident occurred: _____		Date/time incident reported to QI/IC: _____
	Facility/Source: _____		
	Latitude: _____		Longitude: _____
	Nearest city and distance: _____		
	Reason of discharge: _____		

	Capacity of tank(s) involved: _____		
Materials Discharged	Quantity: _____ gals/bbls Material: _____ API Gravity: _____		
	Quantity in Water: _____ gals/bbls Length: _____ ft/mi Width: _____ ft/mi		
	Estimated percentage of area covered by slick = _____		
	Color of slick (that is, 20% brightly colored; 80% dull; to total 100%)		
	Appearance %: ☐ barely visible ☐ silvery ☐ slightly colored ☐ brightly colored ☐ dull ☐ dark		
Weather	Air temp: _____ °F Water temp: _____ °F		
	Ceiling: _____ ft Visibility: _____ mi Seas: _____ ft		
	Wind direction/velocity: _____ From: _____ @ _____ kts/mph		
	Current direction/velocity: _____ To: _____ @ _____ kts/mph		
Response Action	Actions taken to correct/mitigate incident: _____		
Additional Information	Injuries: _____ Fatalities: _____		
	Evacuated: _____		
	Damage: _____		

DO NOT DELAY REPORTING PENDING ADDITIONAL INFORMATION—CALL THE NRC AT (800) 424-8802.			

I am _____ representing _____
(name and title)

_____. At approximately _____
(company name) (time and date)

we had a (characterize incident) _____ (characterize incident)

(Note: Do not speculate. If you do not know the answer to a question, say “I do not know.” Refer requests for additional information to the designated contact.)

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Site Safety Assessment
(Page 1 of 3)

Applies to Site:																									
Date:		Incident:																							
Products:		(Attach MSDS)																							
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Air Monitoring																									
%LEL _____ %O2 _____ PPM Benzene _____ PPM H ₂ S _____ Other (specify) _____																									

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Site Safety Assessment
(Page 2 of 3)

Control Measures**Engineering Controls**

- ☐ Source of release secured ☐ Valve(s) closed ☐ Facility shut down
☐ Site secured ☐ Energy sources locked/tagged out
☐ Other _____

Personal Protective Equipment (PPE)

- ☐ PVC suits ☐ PE/TYVEK suits ☐ Respirator _____
☐ Nitrile gloves ☐ PVC gloves ☐ Other _____
☐ Rubber boots ☐ Hardhats ☐ Eye protection

Decontamination

Stations established _____

Sanitation

Facilities provided per OSHA 1910.120(n).

Illumination

Facilities provided per OSHA 1910.120(m).

Medical Surveillance

Will be provided per OSHA 1910.120(f).

Work Plan (Buddy system must be used.)

- ☐ Booming ☐ Skimming ☐ Vacuum trucks ☐ Pumping ☐ Excavation
☐ Heavy equipment ☐ Sorbent pads ☐ Patching ☐ Hot work ☐ Shoring
☐ Appropriate permits issued
☐ Other (describe): _____

Training

Verified site workers trained per OSHA 1910.120.

Organization

Incident Commander: (D) _____ Radio/telephone: _____
(N) _____
Deputy IC: (D) _____ Radio/telephone: _____
(N) _____
Safety Officer: (D) _____ Radio/telephone: _____
(N) _____
Public Affairs Officer: _____ Radio/telephone: _____

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Site Safety Assessment
(Page 3 of 3)

Emergency Plan

Alarm system: _____

Evacuation plan: _____

First aid locations: _____

Notify the following as soon as possible:☐ Hospital: _____ Phone: _____☐ Ambulance: _____ Phone: _____☐ Air ambulance: _____ Phone: _____☐ Fire: _____ Phone: _____☐ Police: _____ Phone: _____**PRE-ENTRY BRIEFING:**☐ Date/time completed: _____ By: _____☐ Hazards discussed (attach training documentation): _____☐ Other topics: _____

Date/Time Plan Completed: _____ By: _____

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Waste Management Form
(Page 1 of 5)

- Always work safely in an environmentally sound manner.
- Minimize waste.
- Consider waste management and generation in all actions.
- Never mix waste; always segregate.
- Report any accident or incident to your supervisor immediately.
- Reference the Waste Management Plan for specific process required for each waste type.

A. Introduction

Incident Name: _____

Date of Incident: _____

Time of Incident: _____

Individual in Charge of Site: _____

B. Site Description

Location of Site: _____

Description of Site Including
Surrounding Area (shoreline, marsh,
etc. – attach maps): _____

Access/Limitations (highway/bridge
limitations, boat/shallow water, etc. -
attach maps): _____

Any Additional Information /
Considerations: _____

Present Weather Conditions: _____

12-Hour Forecast: _____

24-Hour Forecast: _____

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Waste Management Form
(Page 2 of 5)

C. Site Specific Safety Plan

This plan must be completed and attached before starting any physical work. One plan must be completed for each waste handling/storage area.

D. Type of Waste Generated from Response Operations

Wastes generated by oil spill cleanup fall into several different types. Use the following to identify your wastes. Remember—never mix wastes!

Waste Stream	Sources
<u>Non-Hazardous</u>	
Oilly Liquid	Recovery operations; vessels, vehicle, aircraft and equipment operations; personnel and equipment decontamination operations; waste storage and disposal area storm water runoff control operations; wildlife washing operations; equipment demobilization operations.
Non-Oily Liquid	Sewage collection operations; gray water collection operations; laundry operations; oil/water separation operations; wildlife rehabilitation operations.
Oil Solids	Recovery operations; debris removal operations; in-situ burning operations; site restoration operations; personnel and equipment decontamination operations; equipment demobilization operations; wildlife capture, cleaning and rehabilitation operations.
Non-Oily Solids	Recovery operations; debris removal operations; garbage collection operations; construction operations; site restoration operations; wildlife capture, cleaning and rehabilitation operations; equipment demobilization operations.
<u>Hazardous</u>	
	Vessels, vehicle, aircraft and equipment operations; dispersant use operations; wildlife rehabilitation operations.

E. Containerized and Stored=Waste

Waste accumulated at spill cleanup sites will have to be containerized and stored. Note that each waste stream will have to be classified as to its hazardous nature. Additionally, each container will have to be properly identified and marked for hazard communications as well as properly marked and labeled to meet Department of Transportation requirements before shipment. All hazardous waste must be transported immediately to the nearest shore base for continued storage.

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Waste Management Form
(Page 3 of 5)

- F. Temporary waste sites will have to be identified and established. These sites will need to be in close proximity to the cleanup site. Security requirements must be considered along with the access to outside transportation. These storage areas should be established with the following being considered: distance to living/working areas (cleanup operations as well as the general public), local wildlife impact, security, cleanup of spilled product and rainwater runoff. The following section should be completed for each temporary storage site. To establish security, contact the Logistics Section Chief.

Site Location	Security	Access

- G. Company-approved treatment, recycling and disposal facilities are listed below. Prior contact must be made with the facility as soon as the waste is identified and an estimated volume is established.

Company Name, Address, Phone Number	Contact (Complete When Called)	Type Waste Approved For

- H. Company-approved waste transporters should be used to haul all waste. The following is a list of transporters presently being used to transport wastes. The shipper must ensure that all Department of Transportation requirements are met. Additionally, all waste must be accompanied by a properly completed manifest or shipping paper. All containers must be secure and strong. All dump trucks or rolloff bins should be lined to prevent spillage or contamination of other areas.

Company Name, Address, Phone Number	Contact (Complete When Called)	Type Waste Approved For

- [illegible]

- 11

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Waste Management Form
(Page 5 of 5)

- K. Equipment, manpower, and expenditures must be controlled and documented. The following can be used for this purpose. If additional assistance is required in cost control, contact the Finance Section Chief. If additional assistance is required in purchasing or locating equipment or supplies, contact the Logistics Section Chief.

Equipment					
Waste Handling Equipment	Vendor	S.O. Number	Days Used	Cost Per Day	Total Cost

Manpower					
Waste Handling Equipment	Vendor	S.O. Number	Days Used	Cost Per Day	Total Cost

Other costs (Fuel, Tools, Repair, Container Rental/Purchase)					
Waste Handling Equipment	Vendor	S.O. Number	Days Used	Cost Per Day	Total Cost

Total Cost =

- L. Waste management sites are identified in this Section.
- M. Report all accidents/incidents immediately to your supervisor. Always work safely and in an environmentally sound manner.

Nautilus Pipeline Company, L.L.C.
Weekly Inspection Log – Page 1 of 2

Field/Facility: Nautilus Facility		Inspection Date:	
Inspection	Acceptable	Unacceptable	Not Applicable
Inspect all vessels for proper operation and condition including:			
Gauges			
Sight glasses			
Level controls			
Pressure controls			
Connection leaks			
Remarks:			
Inspect for leaks on:			
Control valve packing and pumps			
Block valves			
Unions			
Flange connections			
Piping			
Remarks:			
Inspect all traps, drains and sumps for oil accumulation			
Inspect all traps, drains and sumps for proper operation of level controls and pumps			
Remarks:			
Inspect tank seams, tank surfaces and base of tanks for leaks and external corrosion			
Remarks:			
Evaluate field constructed tanks having undergone repair, alteration, reconstruction, or change in service for risk of failure due to brittle fracture			
Remarks:			
Inspect vent system outlets and sump piping or gutters to ensure they are not obstructed			
Remarks:			

Weekly Inspection Log – Page 2 of 2			
Inspection	Acceptable	Unacceptable	Not Applicable
Inspect area surround vessels, piping and facility for oil sheens or accumulations, spilled material, soil discoloration, or stressed vegetation			
Remarks:			
Inspect secondary containment systems for structural integrity and the presence of oil sheens or accumulations			
Remarks:			
Inspect area surrounding containment for presence of spilled material, debris, or stressed vegetation			
Remarks:			
Inspect the components of the saltwater disposal system to detect possible system upsets capable of causing a discharge			
Remarks:			

Signature _____

***Daily Visual Inspections**

Atmospheric storage tanks are equipped with automatic tank gauging devices and high liquid level sensing devices/alarms, and are gauged both daily and prior to unloading.

Daily visual inspections are conducted to check pumps, piping, and transfer areas for evidence of leaks, spills or corrosion and are in proper working order. Piping, valves, and pumps are located within containment areas or in areas where spillage can be easily collected by facility personnel.

Signature _____

Nautilus Pipeline Company, L.L.C.
Annual Inspection Log - (Page 1 of 2)

Field/Facility: Nautilus Facility	Inspection Date:		
Inspection	Acceptable	Unacceptable	Not Applicable
Tank Inspection			
Drip Marks			
Discoloration of tanks			
Puddles containing spilled or leaked materials			
Corrosion			
Cracks			
Localized dead vegetation			
Remarks:			
Foundation Inspection			
Cracks			
Discoloration			
Puddles containing spilled or leaked materials			
Settling			
Gaps between tank and foundation			
Damage caused by vegetation roots			
Remarks:			
Appurtenances Inspection			
Thief hatch and vent valves seal properly			
Overflow piping operational and in good condition			
Flame arrestor operational on vent line			
Tank supports, stairways/waterways integrity			
Remarks:			
Secondary containment Inspections			
Visible cracks or seepage in berm or containment			
Erosion or damage to berm or containment			
Spilled material or stressed vegetation surrounding area			
Storm water drain line valves locked			
Remarks:			

Nautilus Pipeline Company, L.L.C. Annual Inspection Log (Page 2 of 2)			
Inspection	Acceptable	Unacceptable	Not Applicable
Piping Inspections			
Droplets of stored materials			
Discoloration			
Corrosion			
Bowing of pipe between supports			
Evidence of stored materials seepage from valves or seals			
Localized dead vegetation			
Remarks:			
Miscellaneous Inspections			
Tankage cathodic protection system operational			
Pipeline cathodic protection system operational			
Storage capacity adequate for anticipated production			
Pressure Safety Valves			
Fire Extinguisher (3 rd Party Audit)			
Remarks:			

Signature _____

Nautilus Pipeline Company, L.L.C.
Equipment Inspection/Maintenance Record

Field/Facility/Well: Nautilus Facility
District/Division: _____

Equipment ID and Condition	Action Taken	Date Completed	Operator Initials

[illegible]

19

Nautilus Pipeline Company, L.L.C.
Nautilus Facility
Safe Operations Meetings Minutes

Date: _____
 Time: _____
 Location: _____
 Chairman: _____

Actual demonstration of the correct method of doing a job makes a lasting impression, and when possible should be made a part of each Loss Control Meeting.

1. Safety Topics Discussed and Items Emphasized:

2. Material Other Than Safety Topics Used:

3. Hazards, Accidents, Near Accidents, Fires or Potential Fires Discussed:

4. Demonstrations Conducted (Describe in Detail):

5. Safety Ideas Suggested – Action Taken Locally:

6. Safety Suggestions Requiring Division or Regional Office Action:

Employees Present:

Name

Social Security Number

Contract Employees and Guests:

Name

Social Security Number

Employees Absent:

Reason for Absence:

21

OIL SPILL RESPONSE CHECKLIST: IN-SITU BURNING**Nautilus Pipeline Company, L.L.C.****Nautilus Facility****1) SPILL DATA**

(to be completed by Responsible Party and submitted to FOSC)

- A) Name of Incident: _____
- B) Date and time of Incident: Mo/Day/Year: _____ Time: _____
- C) Incident Type: _____
 Transfer Operation _____ Blowout _____
 Pipeline Rupture _____ Explosion _____
 Storage Tank Failure _____ Other _____
- D) Did Spill Source Ignite? Yes: _____ No: _____
 Is Source Still Burning? Yes: _____ No: _____
- E) Spill Location: _____
 Latitude: _____ Longitude: _____
- F) Distance (miles) & Direction to Nearest
 Populated Area (Name of City/Town): _____
- G) Products Released: _____
- H) Product(s) Easily Emulsified? Yes: _____ No: _____
 Uncertain: _____
- I) Product(s) already Emulsified upon Release? No: _____
 Light Emulsion (0-20%) _____ Moderate Emulsion (21-50%) _____
 Heavy Emulsion (>5%) _____ Unknown Emulsion _____
- J) Estimated Volume(s) of Product Released: _____ Gals/bbls
 _____ Gals/bbls
- K) Estimated Volume(s) of Product that Could Still be Released:
 _____ gals _____ Bbls
 _____ gals _____ Bbls
- L) Release Status:
 Continuous: _____ Estimated Rate: _____
 Intermittent: _____ Estimated Rate: _____
 1 time only ("batch" spill); flow now stopped: _____
- M) Estimated Area of Spill:
 Approx. Date/Time: _____ Surface Area _____ Sq Miles (Stat _____ Naut. _____)
 Approx. Date/Time: _____ Surface Area _____ Sq Miles (Stat _____ Naut. _____)

2) WEATHER AND WATER CONDITIONS AT TIME & LOCATION OF SPILL

(To be completed by responding party and submitted to FOSC)

OIL SPILL RESPONSE CHECKLIST: IN-SITU BURNING**Nautilus Pipeline Company, L.L.C.****Nautilus Facility**

- A) Temperature: Air _____ (deg F) Water _____ (deg F)
- B) Weather: Clear _____ Partly Cloudy _____ Heavy Overcast _____
 Rain: Heavy _____ Moderate _____ Light _____
 Fog: _____ Type & Amount at Spill Source _____
 Type & Amount at Burn Site _____
- C) Wind Speed: _____ Knots Wind Direction (from) _____
- D) Other Considerations:
 General Visibility _____
 Flooding Potential _____
 Associated Debris _____
 Other Hazards _____

NOTE:

See Section 4) of this Checklist for Weather and Water Conditions Forecast (to be completed by NOAA Scientific Support Coordinator). See Section 5) of this Checklist for Predicted Oil Behavior (to be completed by NOAA Scientific Support Coordinator). Responding Party has option of also submitting information on Predicted Oil Behavior to FOSC.

3) PROPOSED BURNING PLAN (To be completed by Party Responding to Spill)

- A) Location of Proposed Burn with respect to Spill Source:

- B) Location of Proposed Burn with respect to nearest Ignitable Oil Slick(s):

- C) Location of Proposed Burn with respect to nearest Land:

- D) Location of Proposed Burn with respect to Commercial Fishing Activity, Vessel Traffic Lanes, Drilling Rigs and / or other Marine Activities / Facilities:

- E) Risk of Accidental (Secondary) Fires:

- F) Risk of Reducing Visibility at Nearby Airstrip(s) or Airport(s):

- G) Distance to, location and type of nearest Population Center(s) (e.g. Recreational Site, Town, City, etc.):

- H) Methods that will be used (prior to ignition) to Notify Residents in areas where smoke could conceivably drift into or over such areas:

- I) Type of Igniter proposed for use:

OIL SPILL RESPONSE CHECKLIST: IN-SITU BURNING
Nautilus Pipeline Company, L.L.C.
Nautilus Facility

J) Helicopter(s) needed to deploy igniters? Yes _____ No _____
 Name of Company and type of Helicopter to be used: _____

FAA approval already granted to Company for use of Igniter: Yes _____ No _____
 Awaiting FAA Approval or Verification of prior approval: Yes _____ No _____

K) Burning Promoters or Wicking Agents proposed for use? Yes _____ No _____
 If yes, give type and amount: _____

L) Describe proposed Method of Deployment for Igniter(s): _____

Burning Promoter(s): _____

Wicking Agent(s): _____

M) Describe Method for Containment, if any: _____

N) Proposed Location of Oil Containment relative to Spill Source: _____

O) Proposed Burning Strategy:
 _____ Immediate Ignition at or near Source
 _____ Ignition away from source after Containment and Movement to Safe Location
 _____ Ignition of uncontained slick(s) at a Safe Distance
 _____ Controlled Burning in Boom or natural collection site at / near Shore
 _____ Possible need for Multiple Ignition Attempts

P) Estimated Amount of Oil to be Burned: _____

Q) Estimated Duration of each Burn: _____
 Total Possible Burn Period: _____

R) Estimated Smoke Plume Trajectory: _____

S) Method for Collecting Burned Oil Residue: _____

T) Proposed Storage & Disposal of Burned Oil Residue: _____

OIL SPILL RESPONSE CHECKLIST: IN-SITU BURNING
Nautilus Pipeline Company, L.L.C.
Nautilus Facility

- B) Will the use of In-Situ Burning interfere with (or in any way reduce the effectiveness of) mechanical recovery and / or dispersant application? Yes _____ No _____

 If yes, do the potential Benefits of Burning outweigh the potential reductions in effectiveness of mechanical / dispersant use? Yes _____ No _____

- C) Can In-Situ Burning be used Safely, and with an anticipated overall Reduction in Environmental Impact (compared with the decision not to burn)? Yes _____ No _____

8) FEDERAL ON-SCENE COORDINATOR'S DECISION REGARDING IN-SITU BURNING
 (To be completed by FOSC)

- A) _____ Do not Conduct In-Situ Burn
- B) _____ In-Situ Burn may be Conducted in Limited or Selected Areas
- C) _____ In-Situ Burn may be Conducted as Requested

NOTE:

If the FOSC approved of In-Situ Burning, Local Media and Residents in Areas within the Potential Smoke Plume Trajectory must be Notified Prior to Initiating the Burn.

Signature of FOSC: _____

Printed Name of FOSC: _____

Time / Date of Decision: _____

**Nautilus Pipeline Company, L.L.C.
Nautilus Facility**

Request Format for Use of Alternative Response Technology

DATE: _____

TO: Region _____ Regional Response Team Members
SUBJECT: Request for Use of _____ Product(s) on the NCP
 Product Schedule

The purpose of this letter is to solicit approval from the Region VI Regional Response Team (RRT) for the use of _____ product or technology in treating the oil from the _____ spill in _____. The proposed use of this product or technology is outlined below, including conditions of use:

- Description of the cleanup problem to be addressed by use of the product:
- Outline why the product(s) or technology was selected:
- Summary of any toxicological or environmental data on the product, to assist in evaluation of its toxicity:
- Description of the general areas where the product will be used: [also describe areas where use of the product will be prohibited (attach lists and/or maps with more details on specific areas proposed for product use)]:
- Estimate of the amount of product to be used, either in each area or in total:
- Description of actions to be taken to minimize environmental impact:
- Description of any testing or monitoring programs that will be implemented during product evaluation and use:
- Why it is believed that the use of this product in the environments selected will provide a net environmental benefit over other cleanup strategies?
- Other pertinent information:

Nautilus Pipeline Company, L.L.C.
Nautilus Facility

PREP INTERNAL EXERCISE DOCUMENTATION FORM

Quarterly
Notification Exercise

- 1) Date Performed: _____
- 2) Exercise or Actual Response: EXERCISE
- 3) Facility Initiating Exercise: _____
- 4) Name/Position of Facility Personnel Initiating Exercise: _____
- 5) Name of Person Notified: _____
Is this person identified in your response plan as a Qualified Individual? _____
- 6) Time initiated: _____
Time at which Qualified Individual responded: _____
- 7) Method & number used to contact QI:
☐ Telephone: _____ ☐ Pager: _____ ☐ Radio: _____
☐ Other: _____
- 8) Description of notification procedure and/or comments: _____

Certifying Signature*

Note - Retain this form for a minimum of 3 years.

- * Certification - is the act of confirming that an exercise (1) was completed; (2) was conducted in accordance with the PREP guidelines, meeting all objectives listed; and (3) was evaluated using a mechanism that appraised the effectiveness of the response or contingency plan.

Nautilus Pipeline Company, L.L.C.
Nautilus Facility

Quarterly QI Notification Exercise
Conversation/Action Record

Date: _____
 Position: _____
 Name: _____

Page _____ of _____

No	Time:	Phone:	x		Person/Telephone #:	Title:	Representing:
		Fax:	☐	Incoming:	☐	-	
		Other:	☐	Outgoing:			
No.	Time:	Phone:	☐		Person/Telephone #:	Title:	Representing:
		Fax:	☐	Incoming:	☐		
		Other:	☐	Outgoing:	☐		
No.	Time:	Phone:	☐		Person/Telephone #:	Title:	Representing:
		Fax:	☐	Incoming:	☐		
		Other:	☐	Outgoing:	☐		



U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

INCIDENT REPORT - GAS TRANSMISSION AND GATHERING SYSTEMS

Report Date _____

No. _____
(DOT Use Only)

INSTRUCTIONS

Important: Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the Office Of Pipeline Safety Web Page at <http://ons.dot.gov>.

PART A - GENERAL REPORT INFORMATION

Check one: ☐ Original Report ☐ Supplemental Report ☐ Final Report

Operator Name and Address

- a. Operator's 5-digit Identification Number (when known) / / / / /
- b. If Operator does not own the pipeline, enter Owner's 5-digit Identification Number (when known) / / / / /
- c. Name of Operator _____
- d. Operator street address _____
- e. Operator address _____
City, County or Parrish, State and Zip Code

2. Time and date of the incident

<u> </u> / <u> </u> / <u> </u>	<u> </u> / <u> </u> / <u> </u>	<u> </u> / <u> </u>	<u> </u>
hr.	month	day	year

3. Location of Incident

a. _____
Nearest street or road

b. _____
City and County or Parish

c. _____
State and Zip Code

d. Mile Post/Valve Station _____

e. Survey Station No. _____

f. Latitude: _____ Longitude: _____
(if not available, see instructions for how to provide specific location)

g. Class location description
Onshore: ☐ Class 1 ☐ Class 2 ☐ Class 3 ☐ Class 4
Offshore: ☐ Class 1 *(complete rest of this item)*
Area _____ Block # _____
State / / or Outer Continental Shelf ☐

h. Incident on Federal Land other than Outer Continental Shelf
☐ Yes ☐ No

i. Is pipeline Interstate ☐ Yes ☐ No

4. Type of leak or rupture

☐ Leak: OPinhole OConnection Failure *(complete sec. F5)*
☐ Puncture, diameter *(inches)* _____

☐ Rupture: ☐ Circumferential – Separation
☐ Longitudinal
– Tear/Crack, length *(inches)* _____
– Propagation Length, total, both sides *(feet)* _____

☐ N/A
☐ Other: _____

a. ☐ Fatality Total number of people: / /

Employees: / / General Public: / /

Non-employee Contractors: / /

b. ☐ Injury requiring inpatient hospitalization Total number of people: / /

Employees: / / General Public: / /

Non-employee Contractors: / /

c. ☐ Property damage/loss *(estimated)* Total \$ _____

Gas loss \$ _____ Operator damage \$ _____

Public/private property damage \$ _____

d. ☐ Release Occurred in a ‘High Consequence Area’

e. ☐ Gas ignited – No explosion f. ☐ Explosion

g. ☐ Evacuation *(general public only)* / / / / / people

Reason for Evacuation:
☐ Emergency worker or public official ordered, precautionary
☐ Threat to the public ☐ Company policy

6. Elapsed time until area was made safe:

 / / hr. / / min.

7. Telephone Report

 / / / / / / / / / / / month day

NRC Report Number

8. a. Estimated pressure at point and time of incident:

_____, PSIG

b. Max. allowable operating pressure (MAOP): _____

c. MAOP established by 49 CFR section:
☐ 192.619 (a)(1) ☐ 192.619 (a)(2) ☐ 192.619 (a)(4)
☐ 192.619 (a)(4) ☐ 192.619 (c)

d. Did an overpressurization occur relating to the incident? OYes ONo

PART B – PREPARER AND AUTHORIZED SIGNATURE

(type or print) Preparer's Name and Title

Area Code and Telephone Number

Preparer's E-mail Address

Area Code and Facsimile Number

Authorized Signature

(type or print) Name and Title

Date _____

Area Code and Telephone Number

Form PHMSA F 7100.2 (01-2002)

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Page 1 of 3

PART C - ORIGIN OF THE INCIDENT

1. Incident occurred on
☐ Transmission System
☐ Gathering System
☐ Transmission Line of Distribution System
2. Failure occurred on
☐ Body of pipe ☐ Pipe Seam
☐ Joint
☐ Component
☐ Other: _____
3. Material involved (pipe, fitting, or other component)
☐ Steel
☐ Plastic (If plastic, complete all items that apply in a-c)
 Plastic failure was: ☐ a. ductile ☐ b. brittle ☐ c. joint failure
☐ Material other than plastic or steel: _____
4. Part of system involved in incident
☐ Pipeline ☐ Regulator/Metering System
☐ Compressor Station ☐ Other: _____
5. Year the pipe or component which failed was installed: / / / /

PART D - MATERIAL SPECIFICATION (if applicable)

1. Nominal pipe size (NPS) / / / / in.
2. Wall thickness / / / / in.
3. Specification _____ SMYS / / / / /
4. Seam type _____
5. Valve type _____
6. Pipe or valve manufactured by _____ in year / / / /

PART E - ENVIRONMENT

1. Area of incident
☐ In open ditch
☐ Under pavement ☐ Above ground
☐ Under ground ☐ Under water
☐ Inside/under building ☐ Other: _____
2. Depth of cover: _____ inches

PART F - APPARENT CAUSE

Important: There are 25 numbered causes in this section. Check the box to the left of the **primary** cause of the incident. Check one circle in each of the supplemental items to the right of or below the cause you indicate. See the instructions for this form for guidance.

F1 - CORROSION

If either F1 (1) External Corrosion, or F1 (2) Internal Corrosion is checked, complete all subparts a - e.

1. ☐ External Corrosion

- a. Pipe Coating
☐ Bare
☐ Coated

- b. Visual Examination
☐ Localized Pitting
☐ General Corrosion
☐ Other: _____

- c. Cause of Corrosion
☐ Galvanic ☐ Stray Current
☐ Improper Cathodic Protection
☐ Microbiological
☐ Stress Corrosion Cracking
☐ Other: _____

2. ☐ Internal Corrosion

- d. Was corroded part of pipeline considered to be under cathodic protection prior to discovering incident?
☐ No ☐ Yes, Year Protection Started: / / / /

- e. Was pipe previously damaged in the area of corrosion?
☐ No ☐ Yes, How long prior to incident: / / / years / / months

F2 - NATURAL FORCES

3. ☐ Earth Movement ⇒ ☐ Earthquake ☐ Subsidence ☐ Landslide ☐ Other: _____
4. ☐ Lightning
5. ☐ Heavy Rains/Floods ⇒ ☐ Washouts ☐ Flotation ☐ Mudslide ☐ Scouring ☐ Other: _____
6. ☐ Temperature ⇒ ☐ Thermal stress ☐ Frost heave ☐ Frozen components ☐ Other: _____
7. ☐ High Winds

F3 - EXCAVATION

8. ☐ Operator Excavation Damage (including their contractors) / Not Third Party

9. ☐ Third Party Excavation Damage (complete a-d)

a. Excavator group

☐ General Public ☐ Government ☐ Excavator other than Operator/subcontractor

b. Type: ☐ Road Work ☐ Pipeline ☐ Water ☐ Electric ☐ Sewer ☐ Phone/Cable ☐ Landowner ☐ Railroad

☐ Other: _____

c. Did operator get prior notification of excavation activity?

☐ No ☐ Yes: Date received: / / mo. / / day / / yr.

Notification received from: ☐ One Call System ☐ Excavator ☐ Contractor ☐ Landowner

d. Was pipeline marked?

☐ No ☐ Yes (If Yes, check applicable items i - iv)

i. Temporary markings: ☐ Flags ☐ Stakes ☐ Paint

ii. Permanent markings: ☐ Yes ☐ No

iii. Marks were (check one) ☐ Accurate ☐ Not Accurate

iv. Were marks made within required time? ☐ Yes ☐ No

F4 - OTHER OUTSIDE FORCE DAMAGE

10. ☐ Fire/Explosion as primary cause of failure ⇒ Fire/Explosion cause: ☐ Man made ☐ Natural
11. ☐ Car, truck or other vehicle not relating to excavation activity damaging pipe
12. ☐ Rupture of Previously Damaged Pipe
13. ☐ Vandalism

F5 – MATERIAL AND WELDS**Material**

14. ☐ Body of Pipe ⇒ ☐ Dent ☐ Gouge ☐ Wrinkle Bend ☐ Arc Burn ☐ Other: _____
15. ☐ Component ⇒ ☐ Valve ☐ Fitting ☐ Vessel ☐ Extruded Outlet ☐ Other: _____
16. ☐ Joint ⇒ ☐ Gasket ☐ O-Ring ☐ Threads ☐ Other: _____

Weld

17. ☐ Butt ⇒ ☐ Pipe ☐ Fabrication ☐ Fitting ☐ Repair Sleeve ☐ Other: _____
18. ☐ Fillet ⇒ ☐ Branch ☐ Hot Tap ☐ Seamless ☐ Flash Weld ☐ Other: _____
19. ☐ Pipe Seam ⇒ ☐ LF ERW ☐ DSAW ☐ Spiral ☐ Other: _____
- ☐ HF ERW ☐ SAW

Complete a-g if you indicate **any** cause in part F5.

- a. Type of failure:
☐ Construction Defect ⇒ ☐ Poor Workmanship ☐ Procedure not followed ☐ Poor Construction Procedures
☐ Material Defect
- b. Was failure due to pipe damage sustained in transportation to the construction or ☐ Yes ☐ No
- c. Was part which leaked pressure tested before incident occurred? ☐ Yes, complete d-g ☐ No
- d. Date of test: ____/____/____ mo. ____/____/____ day ____/____/____ yr.
- e. Test medium: ☐ Water ☐ Natural Gas ☐ Inert Gas ☐ Other: _____
- f. Time held at test pressure: ____/____/____ hr.
- g. Estimated test pressure at point of incident: _____ PSIG

F6 – EQUIPMENT AND OPERATIONS

20. ☐ Malfunction of Control/Relief Equipment ⇒ ☐ Valve ☐ Instrumentation ☐ Pressure Regulator ☐ Other: _____
21. ☐ Threads Stripped, Broken Pipe Coupling ⇒ ☐ Nipples ☐ Valve Threads ☐ Mechanical Couplings ☐ Other: _____
22. ☐ Ruptured or Leaking Seal/Pump Packing

23. ☐ Incorrect Operation

- a. Type: ☐ Inadequate Procedures ☐ Inadequate Safety Practices ☐ Failure to Follow Procedures ☐ Other: _____
- b. Number of employees involved who failed post-incident drug test: ____/____/____ Alcohol test: ____/____/____
- c. Were most senior employee(s) involved qualified? ☐ Yes ☐ No
- d. Hours on duty: ____/____/____

F7 – OTHER

24. ☐ Miscellaneous, describe: _____
25. ☐ Unknown
☐ Investigation Complete ☐ Still Under Investigation (submit a supplemental report when investigation is complete)

PART G – NARRATIVE DESCRIPTION OF FACTORS CONTRIBUTING TO THE EVENT

(Attach additional sheets as necessary)

for each day that such violation persists except that the maximum civil penalty shall not exceed \$500,000 as provided in 49 USC 60122 OMB No. 2137-0047

	ACCIDENT REPORT – HAZARDOUS LIQUID PIPELINE SYSTEMS	Report Date _____ No. _____ (DOT Use Only)
U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration		
INSTRUCTIONS		
Important: Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the Office Of Pipeline Safety Web Page at http://ops.dot.gov .		
PART A – GENERAL REPORT INFORMATION		
Check: ☐ Original Report ☐ Supplemental Report ☐ Final Report		
1. a. Operator's OPS 5-digit Identification Number (if known) _____ b. If Operator does not own the pipeline, enter Owner's OPS 5-digit Identification Number (if known) _____ c. Name of Operator _____ d. Operator street address _____ e. Operator address _____ City, County, State and Zip Code		
IMPORTANT: IF THE SPILL IS SMALL, THAT IS, THE AMOUNT IS AT LEAST 5 GALLONS BUT IS LESS THAN 5 BARRELS, COMPLETE THIS PAGE ONLY, UNLESS THE SPILL IS TO WATER AS DESCRIBED IN 49 CFR §195.52(A)(4) OR IS OTHERWISE REPORTABLE UNDER §195.50 AS REVISED IN CY 2001.		
2. Time and date of the accident ____/____/____ hr. ____/____/____ month ____/____/____ day ____ year	5. Losses (Estimated) Public/Community Losses reimbursed by operator: Public/private property damage \$ _____ Cost of emergency response phase \$ _____ Cost of environmental remediation \$ _____ Other Costs \$ _____ (describe) _____ Operator Losses: Value of product lost \$ _____ Value of operator property damage \$ _____ Other Costs \$ _____ (describe) _____ Total Costs \$ _____	
3. Location of accident (If offshore, do not complete a through d. See Part C.1) a. Latitude: _____ Longitude: _____ (if not available, see instructions for how to provide specific location) b. _____ City, and County or Parish c. _____ State and Zip Code d. Mile post/valve station O or survey station no. O (whichever gives more accurate location) _____	6. Commodity Spilled ☐ Yes ☐ No (if Yes, complete Parts a through c where applicable)	
4. Telephone report ____/____/____ NRC Report Number ____/____/____ month ____/____/____ day ____ year	c. Estimated amount of commodity involved : ☐ Barrels ☐ Gallons (check only if spill is less than one barrel) Amounts: Spilled : _____ Recovered: _____	
CAUSES FOR SMALL SPILLS ONLY (5 gallons to under 5 barrels): (For large spills [5 barrels or greater] see Part H)		
☐ Corrosion ☐ Natural Forces ☐ Excavation Damage ☐ Other Outside Force Damage ☐ Material and/or Weld Failures ☐ Equipment ☐ Incorrect Operation ☐ Other		
PART B – PREPARER AND AUTHORIZED SIGNATURE		
(type or print) Preparer's Name and Title _____		Area Code and Telephone Number _____
Preparer's E-mail Address _____		Area Code and Facsimile Number _____
Authorized Signature _____	(type or print) Name and Title _____	Date _____
_____		Area Code and Telephone Number _____

PART C – ORIGIN OF THE ACCIDENT (Check all that apply)

1. Additional location information

- a. Line segment name or ID _____
- b. Accident on Federal land other than Outer Continental Shelf ☐ Yes ☐ No
- c. Is pipeline interstate? ☐ Yes ☐ No

Offshore: ☐ Yes ☐ No (complete d if offshore)

d. Area _____ Block # _____

State / / or Outer Continental Shelf ☐

2. Location of system involved (check all that apply)

- ☐ Operator's Property
- ☐ Pipeline Right of Way
- ☐ High Consequence Area (HCA)?
Describe HCA _____

3. Part of system involved in accident

- ☐ Above Ground Storage Tank
- ☐ Cavern or other below ground storage facility
- ☐ Pump/meter station; terminal/tank farm piping and equipment, including sumps
- ☐ Other Specify: _____

- ☐ Onshore pipeline including valve sites
- ☐ Offshore pipeline including platforms

If failure occurred on Pipeline, complete items a - g:

4. Failure occurred on

- ☐ Body of Pipe ☐ Pipe Seam ☐ Scraper Trap
- ☐ Pump ☐ Sump ☐ Joint
- ☐ Component ☐ Valve ☐ Metering Facility
- ☐ Repair Sleeve ☐ Welded Fitting ☐ Bolted Fitting
- ☐ Girth Weld

Other (specify) _____

Year the component that failed was installed: / /

5. Maximum operating pressure (MOP)

- a. Estimated pressure at point and time of accident: _____ PSIG
- b. MOP at time of accident: _____ PSIG
- c. Did an overpressurization occur relating to the accident?
☐ Yes ☐ No

a. Type of leak or rupture

O Leak: ☐ Pinhole ☐ Connection Failure (complete sec. H5)☐ Puncture, diameter (inches) _____ORupture: ☐ Circumferential – Separation☐ Longitudinal – Tear/Crack, length (inches) _____

Propagation Length, total, both sides (feet) _____

ON/A

O Other _____

b. Type of block valve used for isolation of immediate section:

Upstream: ☐ Manual ☐ Automatic ☐ Remote Control☐ Check ValveDownstream: ☐ Manual ☐ Automatic ☐ Remote Control☐ Check Valve

c. Length of segment isolated _____ ft

d. Distance between valves _____ ft

e. Is segment configured for internal inspection tools? ☐ Yes ☐ Nof. Had there been an in-line inspection device run at the point of failure? ☐ Yes ☐ No ☐ Don't Know☐ Not Possible due to physical constraints in the system

g. If Yes, type of device run (check all that apply)

☐ High Resolution Magnetic Flux tool Year run: _____☐ Low Resolution Magnetic Flux tool Year run: _____☐ UT tool Year run: _____☐ Geometry tool Year run: _____☐ Caliper tool Year run: _____☐ Crack tool Year run: _____☐ Hard Spot tool Year run: _____☐ Other tool Year run: _____**PART D – MATERIAL SPECIFICATION**

1. Nominal pipe size (NPS) / / / in.
2. Wall thickness / / / in.
3. Specification _____ SMYS / / / / /
4. Seam type _____
5. Valve type _____
6. Manufactured by _____ in year / / / / /

PART E – ENVIRONMENT

1. Area of accident ☐ In open ditch
- ☐ Under pavement ☐ Above ground
- ☐ Underground ☐ Under water
- ☐ Inside/under building ☐ Other _____
2. Depth of cover: _____ inches

PART F – CONSEQUENCES

1. Consequences (check and complete all that apply)

a. Fatalities _____ Injuries _____

Number of operator employees: _____

Contractor employees working for operator: _____

General public: _____

Totals: _____

c. Product ignited ☐ Yes ☐ No d. Explosion ☐ Yes ☐ Noe. ☐ Evacuation (general public only) _____ people

Reason for Evacuation:

☐ Precautionary by company☐ Evacuation required or initiated by public official

f. Elapsed time until area was made safe:

If Yes, how long? _____ days _____ hours _____ minutes _____ hr. _____ min.

2. Environmental Impact

- a. Wildlife Impact: Fish/aquatic ☐ Yes ☐ No
- Birds ☐ Yes ☐ No
- Terrestrial ☐ Yes ☐ No

b. Soil Contamination ☐ Yes ☐ No

If Yes, estimated number of cubic yards: _____

c. Long term impact assessment performed: ☐ Yes ☐ Nod. Anticipated remediation ☐ Yes ☐ NoIf Yes, check all that apply: ☐ Surface water ☐ Groundwater ☐ Soil ☐ Vegetation ☐ Wildlifee. Water Contamination: ☐ Yes ☐ No (If Yes, provide the following)

Amount in water _____ barrels

Ocean/Seawater ☐ No ☐ YesSurface ☐ No ☐ YesGroundwater ☐ No ☐ YesDrinking water ☐ No ☐ Yes (If Yes, check below:)☐ Private well ☐ Public water intake

PART G – LEAK DETECTION INFORMATION

1. Computer based leak detection capability in place? ☐ Yes ☐ No
2. Was the release initially detected by? (check one):
☐ CPM/SCADA-based system with leak detection
☐ Static shut-in test or other pressure or leak test
☐ Local operating personnel, procedures or equipment
☐ Remote operating personnel, including controllers
☐ Air patrol or ground surveillance
☐ A third party ☐ Other (specify) _____
3. Estimated leak duration : days _____ hours _____

PART H – APPARENT CAUSE

Important: There are 25 numbered causes in this Part H. Check the box corresponding to the primary cause of the accident. Check one circle in each of the supplemental categories corresponding to the cause you indicate. See the instructions for guidance.

H1 – CORROSION

1. ☐ External Corrosion
2. ☐ Internal Corrosion
(Complete items a – e where applicable.)
- a. Pipe Coating
☐ Bare ☐ Coated
- b. Visual Examination
☐ Localized Pitting
☐ General Corrosion
☐ Other _____
- c. Cause of Corrosion
☐ Galvanic ☐ Atmospheric
☐ Stray Current ☐ Microbiological
☐ Cathodic Protection Disrupted
☐ Stress Corrosion Cracking
☐ Selective Seam Corrosion
☐ Other _____
- d. Was corroded part of pipeline considered to be under cathodic protection prior to discovering accident?
☐ No ☐ Yes, Year Protection Started: ____/____/____/____/____
- e. Was pipe previously damaged in the area of corrosion?
☐ No ☐ Yes ⇒ Estimated time prior to accident: ____/____/____ years ____/____/____ months Unknown ☐

H2 – NATURAL FORCES

3. ☐ Earth Movement ⇒ ☐ Earthquake ☐ Subsidence ☐ Landslide ☐ Other _____
4. ☐ Lightning
5. ☐ Heavy Rains/Floods ⇒ ☐ Washouts ☐ Flotation ☐ Mudslide ☐ Scouring ☐ Other _____
6. ☐ Temperature ⇒ ☐ Thermal stress ☐ Frost heave ☐ Frozen components ☐ Other _____
7. ☐ High Winds

H3 – EXCAVATION DAMAGE

8. ☐ Operator Excavation Damage (including their contractors/Not Third Party)
9. ☐ Third Party (complete a-f)
- a. Excavator group
☐ General Public ☐ Government ☐ Excavator other than Operator/subcontractor
- b. Type: ☐ Road Work ☐ Pipeline ☐ Water ☐ Electric ☐ Sewer ☐ Phone/Cable
☐ Landowner-not farming related ☐ Farming ☐ Railroad
☐ Other liquid or gas transmission pipeline operator or their contractor
☐ Nautical Operations ☐ Other _____
- c. Excavation was: ☐ Open Trench ☐ Sub-strata (boring, directional drilling, etc...)
- d. Excavation was an ongoing activity (Month or longer) ☐ Yes ☐ No If Yes, Date of last contact ____/____/____
- e. Did operator get prior notification of excavation activity?
☐ Yes; Date received: ____/____/____ mo. ____/____/____ day ____/____/____/____/____ yr. ☐ No
 Notification received from: ☐ One Call System ☐ Excavator ☐ Contractor ☐ Landowner
- f. Was pipeline marked as result of location request for excavation? ☐ No ☐ Yes (If Yes, check applicable items i - iv)
- i. Temporary markings: ☐ Flags ☐ Stakes ☐ Paint
- ii. Permanent markings: ☐
- iii. Marks were (check one): ☐ Accurate ☐ Not Accurate
- iv. Were marks made within required time? ☐ Yes ☐ No

H4 – OTHER OUTSIDE FORCE DAMAGE

10. ☐ Fire/Explosion as primary cause of failure ⇒ Fire/Explosion cause: ☐ Man made ☐ Natural
11. ☐ Car, truck or other vehicle not relating to excavation activity damaging pipe
12. ☐ Rupture of Previously Damaged Pipe
13. ☐ Vandalism

Material

14. ☐ Body of Pipe	⇒	☐ Dent	☐ Gouge	☐ Bend	☐ Arc Burn	☐ Other _____
15. ☐ Component	⇒	☐ Valve	☐ Fitting	☐ Vessel	☐ Extruded Outlet	☐ Other _____
16. ☐ Joint	⇒	☐ Gasket	☐ O-Ring	☐ Threads		☐ Other _____

Weld

17. ☐ Butt	⇒	☐ Pipe	☐ Fabrication		☐ Other _____
18. ☐ Fillet	⇒	☐ Branch	☐ Hot Tap	☐ Fitting	☐ Repair Sleeve
19. ☐ Pipe Seam	⇒	☐ LF ERW	☐ DSAW	☐ Seamless	☐ Flash Weld
		☐ HF ERW	☐ SAW	☐ Spiral	☐ Other _____

Complete a-g if you indicate **any** cause in part H5.

a. Type of failure:

- ☐ Construction Defect ⇒ ☐ Poor Workmanship ☐ Procedure not followed ☐ Poor Construction Procedures
☐ Material Defect

b. Was failure due to pipe damage sustained in transportation to the construction or fabrication site? ☐ Yes ☐ No

c. Was part which leaked pressure tested before accident occurred? ☐ Yes, complete d-g ☐ No

d. Date of test: ____/____/____ yr. ____/____/____ mo. ____/____/____ day

e. Test medium: ☐ Water ☐ Inert Gas ☐ Other _____

f. Time held at test pressure: ____/____/____ hr.

g. Estimated test pressure at point of accident: _____ PSIG

H6 – EQUIPMENT

20. ☐ Malfunction of Control/Relief Equipment	⇒	☐ Control valve	☐ Instrumentation	☐ SCADA	☐ Communications
		☐ Block valve	☐ Relief valve	☐ Power failure	☐ Other _____
21. ☐ Threads Stripped, Broken Pipe Coupling	⇒	☐ Nipples	☐ Valve Threads	☐ Dresser Couplings	☐ Other _____
22. ☐ Seal Failure	⇒	☐ Gasket	☐ O-Ring	☐ Seal/Pump Packing	☐ Other _____

H7 – INCORRECT OPERATION23. ☐ Incorrect Operation

- a. Type: ☐ Inadequate Procedures ☐ Inadequate Safety Practices ☐ Failure to Follow Procedures
☐ Other _____

b. Number of employees involved who failed a post-accident test: drug test: ____/____/____ alcohol test ____/____/____

H8 – OTHER

24. ☐ Miscellaneous, describe: _____
 25. ☐ Unknown
☐ Investigation Complete ☐ Still Under Investigation (submit a supplemental report when investigation is complete)

PART I – NARRATIVE DESCRIPTION OF FACTORS CONTRIBUTING TO THE EVENT

(Attach additional sheets as necessary)

Bomb Threat

(b) (7)(F), (b) (3)

