

Prepared for:

City of North Myrtle Beach  
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North Myrtle Beach, SC 29582

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*THE OIL SPILL CONTINGENCY PLAN  
FOR THE CITY OF  
NORTH MYRTLE BEACH, SOUTH CAROLINA*

U. S. DEPARTMENT OF COMMERCE NOAA  
COASTAL SERVICES CENTER  
2234 SOUTH HOBSON AVENUE  
CHARLESTON, SC 29405-2413

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## PURPOSES AND OBJECTIVES

The City of North Myrtle Beach contains approximately nine miles of beach and oceanfront property that attracts hundreds of thousands of visitors each year. A major oil spill or pollution problem along the city's beaches could inflict severe damage to the city's economy.

The purpose of this contingency plan is to provide a state of readiness to enable the City of North Myrtle Beach to respond quickly and efficiently to a spill incident. In addition, a review of the City's emergency preparedness plan is included.

The objectives of this plan are to:

- 1) Provide a fast and effective means of detecting and reporting oil spills.
- 2) Establish a list of equipment available locally and within a reasonable distance of travel.
- 3) Inventory and evaluate the recreational opportunity capacity of recreation facilities in North Myrtle Beach.
- 4) Assess the vulnerability of North Myrtle Beach's tourism industry to damage caused by oil spills.
- 5) Describe the probable effects of oil spills on the coastal environments of North Myrtle Beach.
- 6) Describe mitigating measures to lessen the potential environmental damage caused by oil spills.

## RELATION TO STATE AND FEDERAL PLANS

This plan does not supersede the contingency plans of the State of South Carolina (giving authority to the Department of Health and Environmental Control "to abate, control, and prevent pollution," Section 48-1-20, S.C. Code of Laws, 1975, as amended. Likewise, the National Contingency Plan is also not superseded by the creation of this plan.

It is clearly the intent of this plan to establish procedures by which the City of North Myrtle Beach can prevent or decrease the detrimental socioeconomic and ecological effects of an oil spill in conjunction with, or in the absence of, state or federal response programs.

## ACKNOWLEDGMENTS

The major funding for this project came through the City of North Myrtle Beach and the Coastal Energy Impact Program, administered by Mr. Michael Rowe of the South Carolina Governor's Office of Natural Resources. John Smithson and Merlin Bellamy, of the City of North Myrtle Beach, are thanked for their assistance and guidance. Mr. John Team of Wilbur Smith and Associates completed the questionnaire survey relating to recreational resources and oil spill vulnerability of North Myrtle Beach.



1.0 EMERGENCY ACTIONS AND  
PHONE NUMBERS



1.0 EMERGENCY ACTIONS AND PHONE NUMBERS

1.1 Initial actions to be taken in the event of a spill are as follows:

- 1) If caused by a known land source, immediately try to stop any operations which may be causing the spill. Act quickly, using common sense.
- 2) Turn off all equipment, especially sources of ignition, which may cause fire or explosion. ENFORCE NO SMOKING!
- 3) Consider personal safety first. Use protective clothing if necessary.
- 4) IMMEDIATELY NOTIFY:

City of North Myrtle Beach - City Manager	272-4000
- and -	
U.S. Coast Guard - Charleston Office (Daytime)	724-4218
- or - After 4:30 PM and Weekends	723-5602
S.C. Dept. of Health and Environmental Control	
Columbia, SC (24 hrs)	758-5531
Columbia (during office hours)	758-5681
Waccamaw District Office - Myrtle Beach	448-8407
- 5) Contain the spill. Block off all drains, culverts, and ditches to prevent oil from escaping contained areas.

## 1.2

## ADDITIONAL PHONE NUMBERS

## 1.2.1

CITY OF NORTH MYRTLE BEACH

- |                                 |          |
|---------------------------------|----------|
| 1) Police Department            | 249-1411 |
| 2) Fire Department              | 249-2233 |
| 3) N. Myrtle Beach Rescue Squad | 272-3144 |
|                                 | 272-7532 |

## 1.2.2

COUNTY AGENCIES

- |   |          |
|---|----------|
| 1) Horry County Civil Defense Agency                | 448-2486 |
| 2) Horry County Sheriff's Office<br>(at courthouse) | 448-2486 |
| 3) Horry County Police                              | 448-4260 |
|   | 448-7917 |
| 4) Civil Air Patrol                                 | 245-9175 |
| 5) County EMS                                       | 272-6139 |
|   | 272-3148 |

## 1.2.3

STATE AGENCIES

- |                                       |          |
|---------------------------------------|----------|
| 1) S.C. Wildlife and Marine Resources | 795-6350 |
| 2) S.C. DHEC (Charleston)             | 554-5533 |
| 3) S.C. Highway Patrol                | 448-9710 |

## 1.2.4

FEDERAL AGENCIES

- |  |                |
|--|----------------|
| 1) Environmental Protection Agency, Atlanta, Georgia | (404) 881-4062 |
| 2) U.S. Fish and Wildlife Service, Charleston        | (803) 795-6350 |
|  | (803) 724-4707 |

## 1.2.5

OTHER

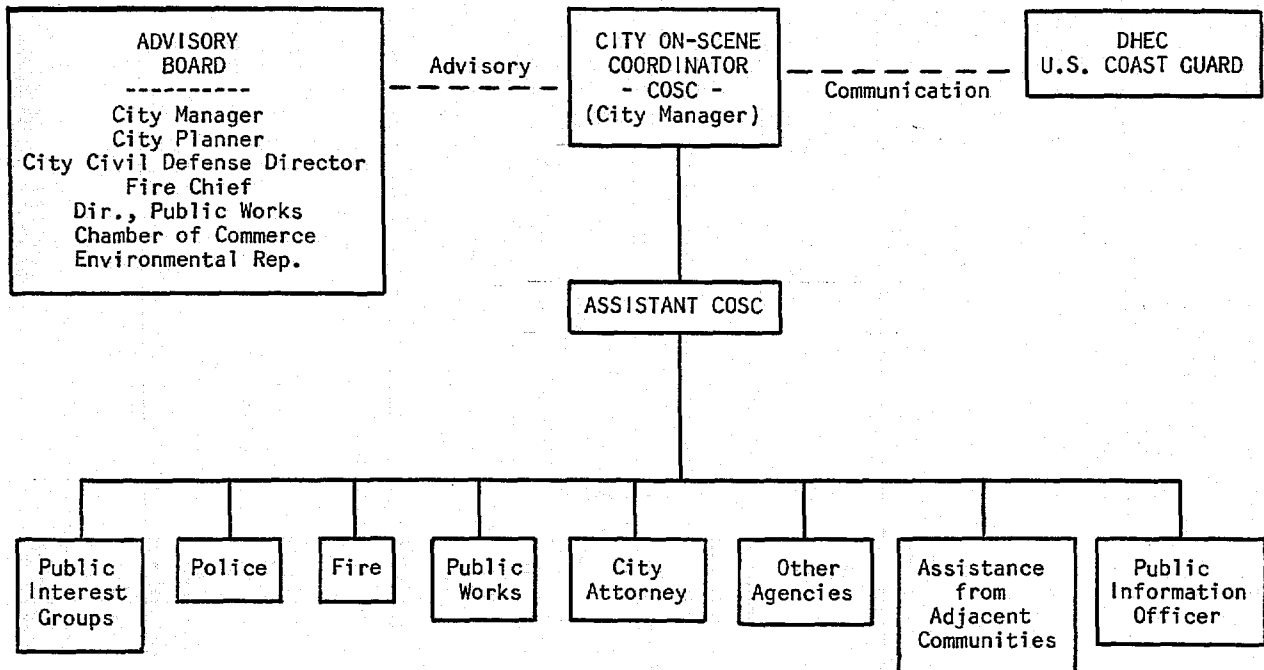
- |   |          |
|---|----------|
| 1) North Myrtle Beach Chamber of Commerce | 249-3519 |
| 2) National Audubon Society, SE Regional  | 723-6171 |
| 3) Sierra Club, Columbia                  | 799-0321 |
| 4) South Carolina Wildlife Federation     | 786-6419 |
| 5) Grand Strand Humane Society            | 249-4948 |



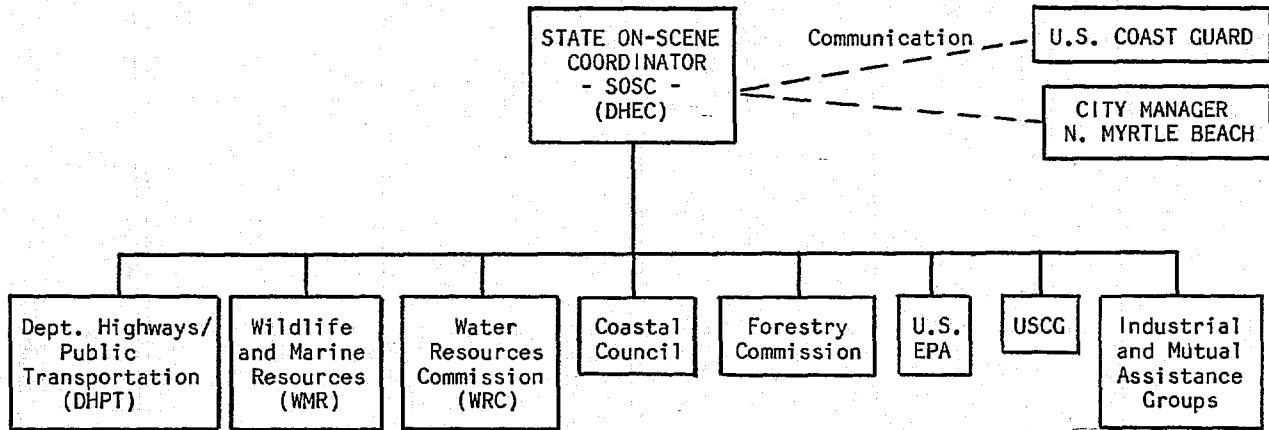
## 2.0 ORGANIZATION

The organizational structure for responding to oil spills on the city, state, and federal levels is included in this section. Even if the spill is controlled by the state or federal response structures, there are distinct methods by which recommendations made by the City of North Myrtle Beach can be passed directly to the person controlling the spill-response effort (the On-Scene Coordinator). The size of the spill and the type of resources at risk or damaged commonly controls the level of response effort.

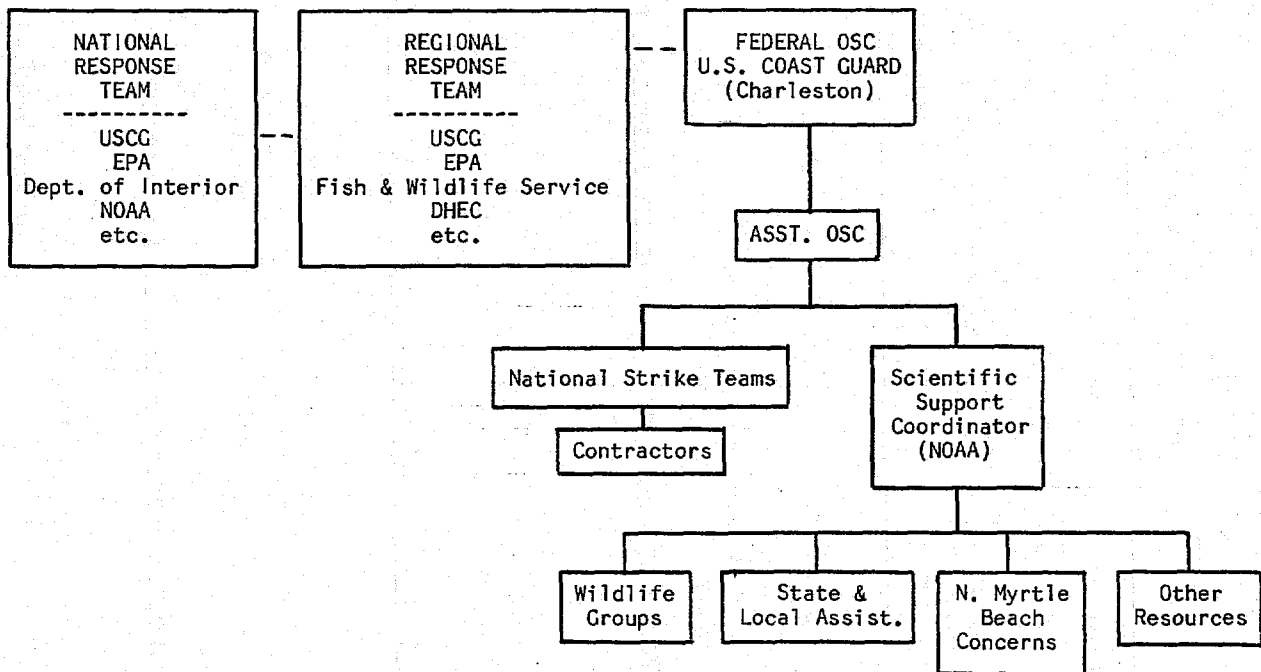
## 2.1 CITY ORGANIZATIONAL STRUCTURE



2.2 STATE ORGANIZATIONAL STRUCTURE



2.3 FEDERAL RESPONSE STRUCTURE



Concerns of N. Myrtle Beach can be voiced through the Regional Response Team or to the OSC, directly or through his intermediaries: the Assistant OSC or Scientific Support Coordinator.

## 2.4 PERSONNEL RESPONSIBILITIES

### 2.4.1 CITY ON-SCENE COORDINATOR

The City Manager, or his designee, will assume the position of City On-Scene Coordinator (COSC), who is responsible for the overall planning of the response operation including establishing response priorities and determining methods of implementation. He is also responsible for coordinating the response effort, for agency notifications, and for preparation of the final spill report. His responsibility also entail several liaison activities, such as with government agencies, legal affairs and with the public. As needed, he may designate assistants to fill such roles as Communications Coordinator, Record Keeper, Ecology Advisor, etc.

### 2.4.2 ASSISTANT COSC

This is the key assistant to the COSC, responsible for aiding the coordination of all activities. As a designee of the COSC, he may be called upon to perform specific tasks, such as direction of the field crews, maintenance of the communications link between the COSC and responding parties with appropriate record keeping, or provision of logistical support for the cleanup workers (meals, clothing, transportation, etc.).

### 2.4.3 SUPPORT COORDINATORS

Support coordinators assist the COSC or his designee with field response activities. He coordinates and directs responding personnel to control or clean up the spill as necessary. He is responsible for maintaining field response records as to men and equipment utilized, time involved, and the effectiveness of the operation. He is also responsible for maintaining a communications link with his immediate supervisor.

### 2.4.4 RESPONSE PERSONNEL

Response personnel will be directed, as needed, for oil spill control or cleanup. Within the response team, cleanup and security supervisors, etc., may be designated by the Support Coordinator. Response personnel can be from the City of North Myrtle Beach staff or contract labor.

#### 2.4.5 LEGAL AFFAIRS

The legal affairs representative advises the COSC on any legal actions that may result from the spill or its cleanup. He may also be called upon to complete or review various contractual arrangements necessary to respond to the spill incident. Likewise, he may advise the settlement of any claims made against the City of North Myrtle Beach for its actions in spill control or cleanup.

#### 2.4.6 PUBLIC AFFAIRS

At the request of the COSC, Public Affairs is responsible for coordinating press-related information and activities. This may be in the form of press releases, press conferences, or organized tours of the spill site. He is also responsible for providing an appropriate press room, maps and outside communications.

3.0 NOTIFICATIONS/REPORTING  
REQUIREMENTS



### 3.0 NOTIFICATIONS/REPORTING PROCEDURES

#### 3.1 ALL SPILLS MUST BE REPORTED TO:

City Manager of City of North Myrtle Beach 272-4000.

Upon notification, the City Manager will notify the following:

DHEC (Columbia) 758-5681 or 758-5531

USCG (Charleston) 724-4218 or 723-5602

If the City Manager cannot be contacted, DHEC or USCG should be contacted directly.

The spill should be reported as:

#### Discharge

Time

Location

Water body

Source

Cause

Material spilled

Quantity

Weather

Notifier

Response by City of North Myrtle Beach

Requested action

#### 3.2 WRITTEN REPORTS

If the City of North Myrtle Beach takes an active role in responding to the spill, the following written report should be filled out by the COSC. Additional material to be filed with the spill response includes documentation concerning:

- 1) Cleanup and other contracts.
- 2) City of North Myrtle Beach costs.
- 3) Operating losses of North Myrtle Beach businesses.
- 4) Man-days of cleanup personnel.
- 5) Field personnel log books.
- 6) Site Photographs.
- 7) Samples collected and analyses.

This material is a legal record of the spill incident and should be treated as such. It may form the basis for obtaining reimbursement from the spiller or the appropriate federal fund. The names and associated tasks of all key response individuals are particularly important. The more accurate and detailed the records, the better.

3.3 CITY OF NORTH MYRTLE BEACH OIL SPILL REPORT FORM

\_\_\_ Offshore \_\_\_ Inland Water \_\_\_ Land

Reported By: \_\_\_\_\_ Phone # \_\_\_\_\_

Date and Time of Spill: \_\_\_\_\_

Date and Time of Discovery of Spill: \_\_\_\_\_

Date and Time Reported: \_\_\_\_\_

USCG Notification: Date & Time: \_\_\_\_\_ To Whom: \_\_\_\_\_

DHEC Notification: Date & Time: \_\_\_\_\_ To Whom: \_\_\_\_\_

Quantity Spilled: \_\_\_\_\_ Type of Oil Spilled: \_\_\_\_\_

Location of Spill: \_\_\_\_\_

Weather Conditions: \_\_\_\_\_

Source of Spill: \_\_\_\_\_

Person(s) Responsible: \_\_\_\_\_ Phone # \_\_\_\_\_

Area Affected: \_\_\_\_\_

Containment/Cleanup Actions: \_\_\_\_\_

Location and Method of Disposal: \_\_\_\_\_

Business Activity Interrupted: ( ) no ( ) yes, How Long? \_\_\_\_\_

Samples Taken: \_\_\_\_\_ Disposition: \_\_\_\_\_

Comments: \_\_\_\_\_

Signature: \_\_\_\_\_ Date & Time: \_\_\_\_\_



#### 4.0 LOGISTICS AND EQUIPMENT

This section provides a description of equipment and manpower available to combat an oil spill in North Myrtle Beach area. These sections provide a local listing of equipment available from nearby communities, from local construction companies, and from regional spill contractors. Much of this information changes rapidly, so it must be periodically updated. The final portion of this section contains a summary of beach access points and potential debris and equipment storage areas.

#### 4.1 REGIONAL COMMUNITY ASSISTANCE\*

REPRESENTATIVE	MANPOWER	EQUIPMENT
Director of Public Works City of Myrtle Beach 626-7645 (ext 129)	Up to 22 people	Front-end loader (1), backhoe (1), backhoe (1), dump trucks (4)
Chairman Georgetown County Council 546-4189	25-30 plus prison workers	Bulldozer (1), backhoe (1), motor graders (6)
Recreation Director Georgetown County 546-4189	15-20	Shovels, picks, rakes, etc.
Administrator City of Georgetown 546-2556	1-30	Road grader (1), backhoes (3)
Administrator City of Conway 248-7351	3-5	Front-end loader (1), backhoes (2), small motor grader (1)
Administrator Surfside Beach  238-5531	4-5	Front-end loader (1), backhoes (2), large motor grader (1), small tractor (1)
Mayor Briarcliffe Acres 272-6772	None	None
Manager City of North Myrtle Beach 272-4000 (ext 221)	3-4	Front-end loader (1), tractor and and rake (1)
Director of Public Works Horry County 448-2486/248-6247	Up to 60	Bulldozers, backhoes, draglines, motor graders, etc.

\*All of the above equipment was volunteered after it was understood that it would be available (a) for short periods of time and (b) only if it would not cause a reduction in the government's ability to provide its services. (Data are accurate as of 18 July 1984.)

## 4.2 LOCAL CONSTRUCTION COMPANIES

COMPANY	CONTACT PERSON	PHONE NUMBER	EQUIPMENT AVAILABLE	EMPLOYEES
Vereen's Const. Co. Hwy. 17, North N. Myrtle Beach, South Carolina	Office Raeford Vereen Jerry Vereen	249-1312 249-1693 249-4641	5 - dump trucks 2 - bulldozers 1 - motor grader 2 - front-end loaders 1 - backhoe 5 - chain saws 1 - portable generator, welder, and cutting torch unit 2 - big pumps, portable	12
Hardee, A. O. & Son Drainage Co. Hwy. 17 Little River, South Carolina	Office Hardee, A. O. Hardee, Benjy	249-1264 249-3316 249-2153	4 - bulldozers 1 - front-end loader 5 - dump trucks 4 - draglines 1 - road grader 4 - pans 1 - low boy, trailer, chain saw and small equipment	25
McLamb, E. L. & Sons Const. Co. Hwy. 17 Little River,	Office McLamb, Thurman McLamb, Kenny	249-2633, 249-4312 249-2519 249-3396	4 - bulldozers 1 - motor grader 1 - backhoe on tracks 1 - truck and low boy trailer 1 - road scraper & loader 1 - dragline 2 - chain saws 4 - farm tractors with blades 1 - portable generator	12
Bellamy, Bryon Little River Hgts. Little River, South Carolina	Bellamy, Bryon	249-1810	1 - dump truck 1 - front-end loader & backhoe 3 - chain saws 1 - 3" high-pressure pump 1 - portable 2000 KW generator 1 - small farm tractor with blade on rear	4
Stevens Const. Co. Route 1 N. Myrtle Beach, South Carolina	Office Mrs. R.E. Stevens Douglas Stevens Dannie Stevens	249-3221 249-3221 249-3221 339-8319	4 - dump trucks 1 - low boy trailer & truck 1 - front-end loader 2 - bulldozers 1 - backhoe and loader on tracks 1 - farm tractor with rear blade 2 - chain saws 1 - welder and cutting torch	8
Joe Stevens Nixon Crossroads Section N. Myrtle Beach, South Carolina	Stevens, Ray	249-1627	2 - dump trucks 1 - bulldozer 1 - track loader 2 - backhoes 1 - farm tractor with rear blade 2 - small 1-ton flatbed trucks 2 - chain saws 1 - portable generator, cutting torch, welder, etc.	2 (Others are available as needed)

#### 4.3 REGIONAL SPILL-RESPONSE GROUPS

The following material is excerpted from the State of South Carolina Contingency Plan (effective summer 1984) and the Coastal Oil Spill Emergency Response Inventory prepared by the South Carolina Department of Health and Environmental Control, 23 October 1981.

## CLEANUP CONTRACTORS

The Emergency Response Section of the South Carolina Department of Health and Environmental Control attempts to maintain a complete listing of cleanup contractors available in and around the state. Anyone having a need for these services may contact the Emergency Response Section for assistance. The Emergency Response Section will not recommend or endorse any company, it's service or product, but will try to help locate a contractor nearest the spill or business site.

Aaxon Industrial, Inc.  
1017 St. George Ave.  
Colonia, NJ 07067  
Working Hours - (800) 526-2181  
All Hours - (201) 636-1581

Anti-Pollution, Inc.  
P.O. Box 885  
1319 Front St.  
Morgan City, LA 70381  
All Hours - (504) 384-9517

Bryson Industrial Services, Inc.  
411 Burton Rd.  
Lexington, SC 29072  
All Hours - (803) 359-7027

C Enterprises, Inc.  
P.O. Box 6183  
Charleston, SC 29405  
Working Hours - (803) 723-7318  
Emergency Numbers - 572-7561 (beeper)  
572-7280 (beeper)  
571-0489, 763-4470,  
or 873-4713 (employee phones)

Ferguson Harbor Service, Inc.  
P.O. Box 8153  
Nashville, TN 37207  
All Hours - (615) 822-3295

Ford Oil Spill Recoveries, Inc.  
4900 Young St.  
Lilburn, GA 30247  
All Hours - (404) 923-9166

Hazardous Waste Technology Services (Haztech)  
3300 Marjan Drive, NE  
Atlanta, GA 30340  
Working Hours - (404) 451-9877  
All Hours - (404) 4517-9942

## CLEANUP CONTRACTORS - Page Two

Maintenance Overflow  
1629 Newberry Ave.  
Columbia, SC 29210  
Working Hours - (803) 781-9694  
Emergency Number - (803) 781-0816

Marine Supply Company  
266 Union Ave.  
Memphis, TN 38103  
Working Hours - (901) 527-8396 or (901) 522-8625  
Emergency Numbers - (901) 685-5319  
(901) 458-3342  
(901) 795-3128

O.H. Materials Company  
16406 V.S. Rt. 224 E.  
P.O. Box 551  
Findlay, Ohio 45839  
All Hours - (800) 537-9540

Oil Mop, Inc.  
P.O. Drawer P  
Belle Chase, LA 70037  
All Hours - (504) 394-6110

Peterson Maritime Services, Inc.  
14101 Old Gentilly Road  
New Orleans, LA 70129  
All Hours - (504) 254-3600

Peterson Maritime Services, Inc.  
1660 South Beltline Highway  
Mobile Alabama 36609  
All Hours - (205) 666-3500

Triangle Resource Industries (TRI)  
P.O. Box 210  
Reidsville, NC 27320  
All Hours - (919) 272-2222



## MILITARY

	Vehicles	Tank Trucks	Boats	Barges	Booms	Skimmers	Portable Pumps	Hoses	Storage Tanks (Portable)	Storage Tanks (Fixed)	Sorbents	Chemicals	Specialized Equipment	Other Equipment
Myrtle Beach Air Force Base Myrtle Beach, South Carolina 238-7520, 24-hr. 238-7410	X	X			X		X	X		X	X	X		X
U. S. Coast Guard Charleston, South Carolina 724-4218, 24-hr. 723-5602			X		X	X			X		X			X
U.S. Navy Charleston, South Carolina 743-3890, 24-hr. 743-3890		X	X	X	X	X	X		X	X	X		X	X

## GOVERNMENT

Adjutant General, Office of Columbia, South Carolina 748-4219	X													X
Conway Public Works Conway, South Carolina 248-9051	X	X												
Florence Public Works Florence, South Carolina 665-3136, 24-hr. 665-3191	X	X												X
Health & Environmental Control, S. C. Department of Columbia, South Carolina 758-5496, 24-hr. 758-5531	X		X		X	X	X	X			X			X
Highways & Public Transportation, S. C. Department of Columbia, South Carolina 758-2256, 24-hr. 758-2815	X		X											
Loris Public Works Loris, South Carolina 756-4004, 24-hr. 756-4000	X	X					X	X						X
Myrtle Beach Public Works Myrtle Beach, South Carolina 448-8316, 24-hr. 448-3111	X		X				X							X

	Vehicles	Tank Trucks	Boats	Barges	Booms	Skimmers	Portable Pumps	Hoses	Storage Tanks (Portable)	Storage Tanks (Fixed)	Sorbents	Chemicals	Specialized Equipment	Other Equipment
Surfside Public Works Surfside Beach, South Carolina 24-hr. 238-2621 or 238-2811	X		X											X
Water Resources, S.C. Columbia, South Carolina 758-2514, 24-hr. 532-4909	X		X											
Wildlife & Marine Resources, S.C. Columbia, South Carolina 758-0042	X		X											
Wildlife & Marine Resources, S.C. Georgetown, South Carolina 546-3283 or 546-8524				X										
<b>CONSTRUCTION</b>														
ACME Construction Company Johnsonville, South Carolina 386-2021, 24-hr. 386-2150	X		X											X
Baker Brothers of Grasham Florence, South Carolina 362-0275 or 423-2211	X		X					X						X
Construction Equipment Charleston Heights, South Carolina 747-7391, 24-hr. 886-6254	X							X						X
Gallup Landscape & Construction Pawley's Island, South Carolina 237-4077, 24-hr. 237-4077	X							X	X					X
Polote Builders, Inc. Savannah, Georgia (912) 232-1188, 24-hr. (912) 236-0578	X	X												X
Poston's Machine Shop Andrews, South Carolina 264-5943, 24-hr. 264-8624	X	X	X	X				X	X					X
Smith & Smith, Inc. Charleston, South Carolina 554-1382, 24-hr. 556-1144 or 766-1774	X													

	Vehicles	Tank Trucks	Boats	Barges	Booms	Skimmers	Portable Pumps	Hoses	Storage Tanks (Portable)	Storage Tanks (Fixed)	Sorbents	Chemicals	Specialized Equipment	Other Equipment
Stafford Industrial Construction Garden City, Georgia (912) 964-5761, 24-hr. (912) 964-5761														X
Tapp Marine Construction, Inc. Bowen, South Carolina 795-8653, 24-hr. 795-8778	X			X			X	X	X					X
Wise Construction Company Hemingway, South Carolina 662-7521	X						X	X						X
Woodbury Associates Marion, South Carolina 423-4490	X						X	X						X
<b>OIL TRANSPORTATION</b>														
Allen Oil Company Florence, South Carolina 662-1466, 24-hr. 669-7243	X	X						X		X	X			X
Battle Oil Nichols, South Carolina 392-3121		X	X											
Bay Enterprises Hilton Head, South Carolina 785-3440		X					X	X	X					X
Chapin Company Myrtle Beach, South Carolina 448-7778, 24-hr. 448-4885	X	X												
Conway Transport North Charleston, South Carolina 552-5094, 24-hr. 871-3207	X	X						X						
Paul Creel Oil Company Conway, South Carolina 248-9113	X	X	X							X				
Dilmar Oil Company Latta, South Carolina 752-5611, 24-hr. 752-7342	X	X						X						

COUNTY / Horry

October 1981

	Vehicles	Tank Trucks	Boats	Barges	Booms	Skimmers	Portable Pumps	Hoses	Storage Tanks (Portable)	Storage Tanks (Fixed)	Sorbents	Chemicals	Specialized Equipment	Other Equipment
Seabrook Oil Charleston, South Carolina 766-5929		X						X	X	X				
Stuckey Oil Company Hemingway, South Carolina 558-3223	X	X												X
<b>OIL SPILL CLEAN-UP</b>														
Environmental Coastal Pollution Columbia, South Carolina 754-9112, 24-hr. 754-9112	X	X	X		X	X	X	X	X		X	X		X
O. H. Materials, Inc. Covington, Georgia (404) 787-3834, 24-hr. 1-800-537-9540	X	X	X		X	X	X	X					X	X
O. H. Materials, Inc. Findlay, Ohio (419) 423-3526, 24-hr. 1-800-537-9540	X	X	X		X	X	X	X					X	X
Pepper Industries, Inc. Charleston, South Carolina 24-hr. 577-9452		X			X			X		X				X
<b>EQUIPMENT RENTAL</b>														
Jack Barry Rentals Savannah, Georgia (912) 354-1433, 24-hr. (912) 944-8066	X		X				X							X
Contractors Service & Rental Charleston, South Carolina 747-9002		X						X	X					X
<b>EMERGENCY MANAGEMENT</b>														
Columbus County Emergency Management Whiteville, North Carolina (919) 642-4728, 24-hr. (919) 642-6551	X	X	X			X								X

COUNTY / Horry

October 1981

	Vehicles	Tank Trucks	Boats	Barges	Booms	Skimmers	Portable Pumps	Hoses	Storage Tanks (Portable)	Storage Tanks (Fixed)	Sorbents	Chemicals	Specialized Equipment	Other Equipment
<b>PAVING</b> Central Grading & Paving Florence, South Carolina 669-8220, 24-hr. 669-0614	X	X												
Janicula Paving Company Charleston, South Carolina 723-6235	X						X		X				X	
<b>RETAIL BUSINESS</b> Carmicheal Oil Company Lake View, South Carolina 759-2232														X
Carolina Sales & Rental Florence, South Carolina 665-5030														X
<b>DISTRIBUTOR</b> Diesel Engineers Charleston Heights, South Carolina 554-5151	X						X							X
<b>INDUSTRIAL CLEAN-UP</b> Phillips Industrial Service Corporation Mt. Pleasant, South Carolina 884-8566 or 884-0106	X						X							X
<b>HIGH PRESSURE CLEAN-UP</b> Energen of Carolina Charleston, South Carolina 556-6506														X
<b>CHEMICAL DISTRIBUTOR</b> Carolina Chemical Equipment Charleston, South Carolina 554-0880												X		X

<i>Vehicles</i>															
<i>Tank Trucks</i>															
<i>Boats</i>															
<i>Barges</i>															
<i>Booms</i>															
<i>Skimmers</i>															
<i>Portable Pumps</i>															
<i>Hoses</i>															
<i>Storage Tanks (Portable)</i>															
<i>Storage Tanks (Fixed)</i>															
<i>Sorbents</i>															
<i>Chemicals</i>															
<i>Specialized Equipment</i>															
<i>Other Equipment</i>															

**SEPTIC TANK SERVICE**

Mackleen Septic Tank  
Loris, South Carolina  
293-2275

X X

**MARINE TOWING**

Marine Industries  
Georgetown, South Carolina  
546-5467 or 546-8721

X

#### 4.4 ACCESS AND DEBRIS STORAGE SITES

The following table presents a listing of all beach access roads and sites for the temporary storage of oily debris and equipment. Although most of the access roads are public, several sites are privately owned and permission must be obtained before using them.

Sites are summarized in terms of fair (F), good (G), or excellent (E) ratings. The site number refers to the map of North Myrtle Beach included at the end of this section. Poor or limited access points are not marked. The City of North Myrtle Beach has designated numerous beach-access walkways; however, these single pathways are not included unless a parking lot is nearby. Asterisks (\*) mark the better sites for access and storage.

SITE NUMBER AND STREET	ACCESS	EQUIPMENT STORAGE	TEMPORARY OILY-WASTE STORAGE	COMMENTS
1) 48th Ave. S.	F	G	G	Parking lot is privately owned by Long Bay Motel/Apartments.
2) 46th Ave. S.	F	G	G	Access limited to stairs over a sea-wall. By Tricia-Lyn Motel/Apartments.
3) 44th Ave. S.	E	F	F	Road goes directly onto beach. A large undeveloped lot is nearby.
*4) 39th Ave. S.	E	G	G	Good road access and large parking lot.
5) 100 yds north of 37th Ave. S.	F	E	E	Contains a large undeveloped lot but only walkways (2) go over the dunes.
6) 33rd Ave. S.	F	F	F	Contains a limited but paved parking lot and a set of stairs for access. Located between two condominium developments.
7) S. Carolina	G	E	E	Undeveloped access at the base of the street could easily be opened. Lots of room for storage.
*8) Atlantic	E	E	E	Paved road leads onto beach. Lots of room for equipment and storage.
9) 27th Ave. S.	G	F	F	Road onto beach needs improvement. A walkway is also present.
*10) 25th Ave. S.	G	G	G	Moderate-sized public lot with good access way.
11) 21st Ave. S.	F	G	G	Moderate-sized public lot, but access is limited to a single walkway.
12) 18th Ave. S.	F	F	F	Limited public parking, and access is limited to a single walkway.
13) 17th Ave. S.	F	G	F	Paved public lot, but access limited to a single walkway. A large public parking lot is across the street.

SITE NUMBER AND STREET	ACCESS	EQUIPMENT STORAGE	TEMPORARY OILY-WASTE STORAGE	COMMENTS
14) 16th Ave. S.	E	F	F	Paved access road, but limited parking and storage.
15) 14th Ave. S.	G	F	F	Paved access road, but limited parking and storage.
16) 9th Ave. S.	G	G	G	Access road needs some improvement. The parking area is unpaved and four lanes wide.
*17) 6th Ave. S.	G	E	E	Good, sandy access road with a wide, sandy parking lot for storage.
18) 2nd Ave. S.	G	F	F	Access road needs improvement. Only limited parking available.
19) 1st Ave. S.	F	G	G	Road access is difficult. A walkway and large paved lot are present.
*20) Main St.	F	E	F	Easy access to beach (utilized greatly by the public) with a large, paved parking lot.
21) 3rd Ave. N.	G	G	G	Access needs improvement for vehicle use. Parking is limited, but the adjacent motel lot (sandy) greatly increases the site's storage capacity.
22) 4th Ave. N.	F	F	F	Access is only by a single walkway. Parking is limited.
23) 5th Ave. N.	F	F	F	Access is only by a single walkway. Parking is limited.
24) 11th Ave. N.	F	E	E	Vehicle access needs work. A large, unimproved sand lot is available for storage. Privately owned, Tilghman Estate.
25) 21st Ave. N.	F	F	F	Limited parking (paved). Access is by stairs only, over a seawall. The adjacent hotel has additional parking.
26) 22nd Ave. N.	G	G	G	Contains a moderate-sized sand lot for storage. Road access is 100 ft to the north.
27) Sea Mountain Rd.	E	G	G	Contains a paved lot and paved access road.
28) 50th Ave. N.	G	F	F	Vehicle access needs some improvement. Parking and storage are very limited.





## 5.0 ENVIRONMENTAL CONSIDERATIONS

The following section contains a description of the shoreline habitats and wildlife of North Myrtle Beach as well as an estimate of spill probabilities in the area.

### 5.1 SHORELINE HABITATS AND PREDICTED OIL INTERACTIONS

After risks to human health and safety, the environment is of a major concern. A shoreline sensitivity analysis undertaken by DHEC and Research Planning Institution (1982) delineated seven major shoreline habitats, listed below in order of increasing sensitivity:

- Exposed Vertical Seawalls.
- Fine-grained Sand Beaches.
- Exposed Tidal Flats (low biomass).
- Exposed Riprap.
- Sheltered Coastal Structures.
- Sheltered Tidal Flats (high biomass and oyster beds).
- Marshes.

The relatively low-ranked, fine-grained sand beaches compose over 85 percent of the entire shoreline. Exposed vertical seawalls and riprap structures are common shore-protection devices found along the backshore of the sand beaches. The sheltered environments are found along the northern and southern ends of the City of North Myrtle Beach. The inlets which feed into these areas must serve as a focal point for collecting incoming oil and preventing its passage into the calmer backwater environments.

The following is a physical and biological description of the shoreline types found in North Myrtle Beach:

#### EXPOSED VERTICAL SEAWALLS

- Physical
  - Man-made structures in back of a narrow beach.
  - Exposed to strong waves and currents along open-ocean shorelines.
- Plants
  - Dominant plants are attached green algae such as Ulva and Enteromorpha.
  - Zonation is controlled by exposure to waves.
  - Surface plant coverage is moderate to high, depending on height of wall with respect to tidal level.

- Animals
  - Barnacles are dominant animals.
  - Barnacles have maximum densities in the upper intertidal zone.
  - Infauna are minimal due to solid substrate.
  - Low diversity, moderate to high density, and low species richness.

### FINE-GRAINED SAND BEACHES

- Physical
  - Usually gentle slope with broad, flat profile.
  - Often exposed to moderate and high wave energy.
  - Shell accumulations may be present in the lower intertidal zone or back-beach area.
- Plants
  - Scattered beach grasses and plants growing at the base of natural dunes.
  - Beach wrack composed of decaying Spartina grasses.
- Animals
  - Insects and amphipods associated with each wrack are present.
  - Burrowing amphipods and polychaete worms are present in the upper and mid-intertidal zones.
  - Some burrowing clams are present in the lower intertidal to subtidal zones.
  - Diversity, density, and species richness low to moderate.
  - Ghost crabs are common at base of dunes along back beach areas.

### EXPOSED TIDAL FLATS (LOW BIOMASS)

- Physical
  - Sediments are generally fine-grained sand.
  - Sediments are very mobile due to waves and tidal currents.
  - Associated with tidal deltas and, in some areas, front sand or mixed sand and shell beaches.
- Plants
  - Very little flora present.
  - Mobile substrate prevents attachment of algae.
- Animals
  - When present, benthic infauna are dominant organisms.
  - Species diversity, density, and richness vary with substrate.
  - Clams, polychaetes, and burrowing crustaceans are the most common macroorganisms.
  - Faunal density is lowest at high intertidal zone, increasing at mid and low intertidal zones.
  - In sand-bottom flats exposed to high wave energy, deep-burrowing clams dominate simple benthic communities.
  - Birds utilize exposed flats as roosting and foraging areas.

### EXPOSED RIPRAP

- Physical
  - Predominantly gravel to boulder-sized riprap revetments.
  - Riprap is composed generally of quarried Piedmont granite or high-grade metamorphic rocks (e.g., gneiss).
  - Most common along back-beach areas as shore protection for developed property.
- Plants
  - Green filamentous algae and Ulva observed on some riprap in the intertidal zone.
- Animals
  - Epifaunal densities are moderate to high.
  - Barnacles are patchy with densities ranging as high as 19,500 individuals per square meter.

### SHELTERED COASTAL STRUCTURES

- Physical
  - Includes bulkheads, riprap, piers, and docks.
  - Dependent on seasonal storm activity.
  - Typically a low-energy environment generally associated with more sensitive back-barrier environments.
- Plants
  - Low to moderate growths of Enteromorpha and Ulva.
- Animals
  - Intertidal zones contain moderate to heavy populations of oysters and their associated biota.

### SHELTERED TIDAL FLATS

- Physical
  - Composed of mud or silty sand.
  - Sheltered from major wave and tidal activity.
  - Usually located in back-barrier areas.
  - Occur with extensive oyster colonies in many areas.
- Plants
  - Mud flats are generally devoid of vegetation.
- Animals
  - Macroinfauna species diversity, density, and richness high.
  - Extensive clam and oyster populations are present.
  - At high tide, these flats support a large epibenthic community of blue crabs, flounder, channel bass, spotted sea trout, and other vertebrate and invertebrate species.
  - At low tide, many species of birds feed on tidal flats.

MARSHES

- Physical
  - Generally fronted by a sheltered tidal flat.
  - Well-sheltered from extreme wave and current action.
- Plants
  - Three types of coastal marshes are present:
    - 1) Low marsh - predominantly Spartina alterniflora occurs in the mid to upper intertidal areas.
    - 2) High marsh - occurs in the upper intertidal to supralittoral zones; some common high marsh plants are Spartina patens, Salicornia virginica, S. bigelovii, Batis maritima, Limonium carolineanum, Sporobolus virginica, and Distichlis spicata.
    - 3) Brackish freshwater marsh - dominated by Juncus roemerianus and Spartina cynosuroides.
- Animals
  - Associated invertebrates include marsh periwinkles, fiddler crabs, pulmonate snails, polychaetes, amphipods, clams, and mussels.
  - Densities of both epifauna and infauna range from moderate to high.
  - Marshes utilized by numerous birds, alligators, raccoons, and rodents for feeding and reproductive habitat.

## 5.2 OIL INTERACTIONS

A summary of predictive oil interactions by oil type and shoreline habitat follows:

### LIGHT VOLATILE OILS

Examples: Distillate fuels such as gasoline, diesel, and No. 2 fuel oil.

#### Physical/Chemical Properties:

- Spreads rapidly.
- High rate of evaporation.
- Highly soluble.
- Tend to form unstable emulsions.
- Very toxic to biota.
- May penetrate substrates.
- Can be removed by simple agitation and low-pressure flushing.

#### Shoreline Interactions:

- Fine-grained Sand Beaches - May penetrate rapidly into the beach sands, but will be rapidly cleaned by natural processes.
- Seawalls and Riprap - Will form a very light coating but would be removed by wave action and evaporation.
- Tidal Flats and Marshes - May kill organisms within the marsh and tidal flat under heavy concentrations. Recovery will take several years. Marsh grasses will be less affected in areas of moderate flushing.

### MODERATE TO HEAVY OILS

Examples: Medium to heavy, paraffin-based, refined, and crude oils.

#### Physical/Chemical Properties:

- Moderate to high viscosity.
- Toxicity variable depending on light fraction composition.
- In summer months, rapid evaporation and solution form less toxic.
- Light fractions may contaminate interstitial water.
- Tend to form stable emulsions under high physical energy conditions.
- Variable penetration, a function of substrate grain size.
- Potential for sinking after weathering and uptake of sediment.
- Weather to tar balls and tarry residue.

#### Shoreline Interactions:

- Fine-Grained Sand Beach - Oil will tend to accumulate on the upper beach face. Under depositional conditions oil will be buried. Penetration will be slight because of well compacted sediments.
- Seawalls and Riprap - Vertical seawalls, bulkheads, and riprap will be blackened with oil. Residence time will be lengthy if oil is allowed to harden.
- Tidal Flats and Marshes - Oil will pass over exposed, sandy flats (carried by the rising tide), but may kill resident organisms. On sheltered flats, oil may mix with the muddy sediments and a killing of resident organisms is likely. On marshes, plants and organisms will be killed if concentrations are heavy.

#### RESIDUAL OILS

Examples: Asphalt, Bunker C, No. 6 fuel oil, and waste oil.

#### Physical/Chemical Properties:

- Form tarry lumps at ambient temperatures.
- Nonspreading.
- May soften and flow when stranded in sun.
- Difficult to recover from water surface using most cleanup equipment.
- Easily removed manually from beaches.
- Toxicity varies, but generally less toxic than lighter oils.

#### Shoreline Interactions:

- Fine-Grained Sand Beach - Oil will not penetrate deeply into substrate and will tend to accumulate on the upper beach face. When large quantities of oil are present, oil will cover entire beach face.
- Seawalls and Riprap - Accumulations would be light and residence time short on vertical seawalls and bulkheads. Oil would adhere to riprap, and well into the structure. Residence time would be lengthy.
- Tidal Flats and Marshes - On sand flats exposed to strong tides and waves, oil will pass across the flat. On sheltered flats, oil will be deposited along the upper fringes and become incorporated in the mud for several years. On marshes, light accumulations will coat the grasses with little damage. Heavy accumulations will quickly coat the marsh surface; damage will be extensive and long-term.

### 5.3 OTHER BIOLOGICAL CONSIDERATIONS

The atlas illustrating the sensitivity of coastal environments and wildlife to spilled oil, completed by Research Planning Institute (1982) for DHEC,

shows that the wildlife of the North Myrtle Beach area consists primarily of oysters in Hog Inlet Estuary and pelicans along the beaches. Pelicans are protected under the federal list of endangered species. Numerous shorebirds also utilize the beaches seasonally. In all cases, should an oil spill affect these organisms, DHEC and the U.S. Fish and Wildlife Service in Charleston should be notified. The Fish and Wildlife Service, in particular, has access to the latest bird cleaning and handling techniques and has the financial support to rapidly set up cleaning centers with the appropriate expertise.

#### 5.4 OIL SPILL PROBABILITY

The major risk of oil impacts on North Myrtle Beach is associated with the tanker and barge transport of petroleum products. Future risks, however, may include those connected to offshore drillings on the continental shelf. Ports of entry for petroleum products lying adjacent to North Myrtle Beach include Georgetown (approximately 40 miles away) and Wilmington (approximately 40 miles away) [See Figure 2]. Charleston is also a major petroleum facility but lies over 90 miles from the study site. A refinery is currently proposed for Georgetown; its completion would double the number of ship calls and triple the quantity of oil handled by Georgetown.

Explicit oil spill risk analyses for tanker traffic have not been published for North Myrtle Beach. However, due to prevailing winds and currents, projected impacts on North Myrtle Beach resulting from spills at these port entrances is likely to be very low. Data generated by the U.S. Geological Survey as part of the outer continental shelf studies program reveal that the probability of oil impacting Myrtle Beach from proposed lease sites or pipeline routes, for the life of the basin and including spills from existing tanker traffic, is near zero for oil floating for less than 10 days and only 1 percent for impacts within 30 days after the incident. Areas to the north and south are much more likely to be impacted, 6 and 9 percent within 30 days.

However, the low statistical occurrence of impacting oil spills should not be a signal for complacency. The washing up of 650 oiled birds onto Myrtle Beach during February 1981, as well as a ship collision just off Nags Head (North Carolina) with resulting shoreline pollution, indicate that oil spills do continue to occur in spite of low statistical probabilities.



FIGURE 2.

OIL SPILL TRANSPORT WILMINGTON, N.C. TO SAVANAH, GA.

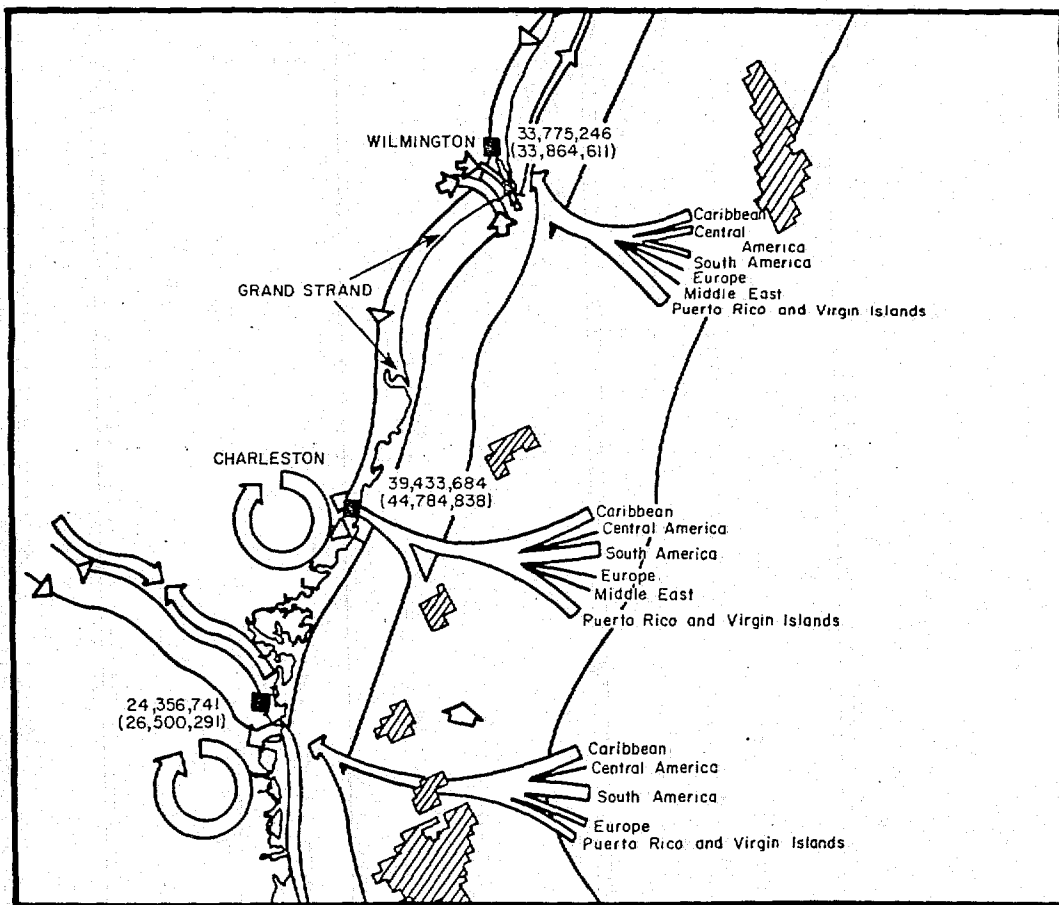
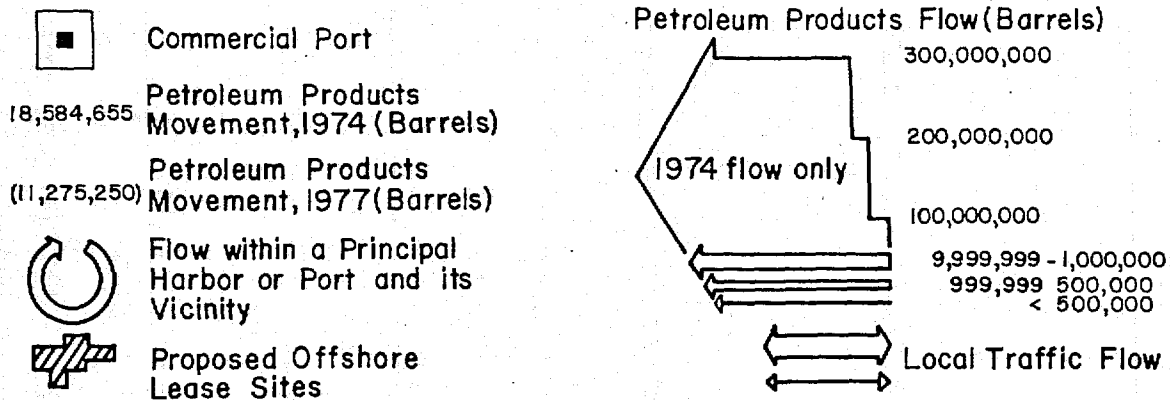


Diagram showing the potential for shoreline impact by spilled oil, oil transport traffic, and proposed effective lease sites (modified from Ray et al., 1980).



## APPENDICES

The appendices included in this document are:

- A. Inventory and Evaluation of Recreational Opportunities
- B. Vulnerability of North Myrtle Beach's Tourism Industry to an Oil Spill
- C. Cleanup Guidelines
- D. Disposal Guidelines
- E. Other

A. RECREATIONAL  
OPPORTUNITIES

## A.0 INVENTORY AND EVALUATION OF RECREATIONAL FACILITIES

### A.1 Summary of Growth and Facilities

North Myrtle Beach is the northeastern portion of the South Carolina coastal beach area known as the Grand Strand, an area 60 miles long with a populated area only a few blocks wide. North Myrtle Beach is about four miles south of the North Carolina Line and has approximately 9 miles of continuous beach-front. The beaches are of a fine white sand and the coastal water is relatively clean as there are no harbors, shipping, or major industries in the area.

The town of North Myrtle Beach was incorporated in 1968 when the municipalities of Cherry Grove, Ocean Drive, Crescent Beach and Windy Hill voted to incorporate into one municipality. Development over the last ten years has changed the character of the area somewhat from that of a low-country residential seaside area into a major resort area.

Between 1970 and 1980, North Myrtle Beach grew from 1,957 permanent residents to 4,150, a growth of 112 percent. The projected permanent population for North Myrtle Beach by 1985 is 6,500. North Myrtle Beach currently has a peak summer population of 85,000 with 9,880 rentable bedrooms in the City.

Employment in North Myrtle Beach is primarily concentrated in retail trade and services, a reflection of its tourist-oriented economy. It was estimated in 1981 that approximately 60.6 percent of the employed persons living in North Myrtle Beach were in retail trade, entertainment, recreation, repair services, personnel services and professional and related services. Only 10.4 percent of the citizens were working in manufacturing, while 5.9 percent were working in transportation or public utilities.

According to a recreation survey conducted in 1984 by the Recreation Department of the South Carolina Division of Parks Recreation, and Tourism (PRT), North Myrtle Beach had the highest per capita expenditure for recreation of all the cities and counties in South Carolina. This phenomenal figure of \$55.45 per resident compared with Charleston which spends \$25.32, with Greenville which spends \$25.18, and Columbia which spends \$19.23. The study estimated that a resident population of slightly more than 4,000 actually serves, in terms of recreational facilities, a population of 20,000 persons. With a full-time recreation staff of 2 persons, supplemented by 3

additional on a seasonal basis, the City operates the following recreational facilities:

<u>Facility</u>	<u>Number</u>
Parks	4
Ball fields	2
Community centers	1
Tennis Courts	7
Basketball courts	3
Soccer fields	1
Picnic shelters	1
Boat ramp	1

Water-oriented recreational facilities within the City Limits of North Myrtle Beach are tabulated below:

Water-Oriented Recreation

- A) Beach - 9 miles, continuous
- B) Sport Fishing Piers (6)
  - 1) Kit's Pier
  - 2) Old Windy Hill Pier
  - 3) Holiday Inn Pier
  - 4) Tilghman's Pier
  - 5) Cherry Grove Pier
  - 6) Inlet Pier
- C) Marinas
  - 1) Palmetto Shores Marina
  - 2) Vereen's Marina (Intracoastal Waterway)
  - 3) City Boat Ramp

As can be noted in the above tabulation, water-oriented recreational facilities in North Myrtle Beach are centered primarily around swimming/sunning, fishing and boating activities. North Myrtle Beach has one of the widest and most stable recreation beaches along the Grand Strand. North Myrtle Beach has twice as many fishing piers as the larger municipality of Myrtle Beach. In addition to the standard variety of marina services, Vereen's Marina also offers ocean cruises aboard a boat capable of transporting large groups for sightseeing, deep-sea fishing and dinner cruises.

Recreational facilities in North Myrtle Beach which are not water oriented are shown in the tabulation below:

Non-Water-Oriented RecreationA) Golf Courses

- 1) Golf Hills Par 3
- 2) Azalea Sands
- 3) Beachwood
- 4) Possum Trot
- 5) Gator Hole
- 6) Surf
- 7) Robbers Roost

B) Parks

- 1) McLean Memorial Park
- 2) Central Park
- 3) Mini-Parks (2)

C) Community Center

- 1) North Myrtle Beach Civic Center

D) Miscellaneous

- 1) Amusement Park (several)
- 2) Miniature Golf (numerous)
- 3) Water Slide
- 4) Outlet Shopping

As noted in the tabulation above there are seven 18-hole golf courses in North Myrtle Beach, only one of which is a par 3. There are two major parks and two mini-parks in North Myrtle Beach. McLean Park on Oak Street in North Myrtle Beach has a lighted ball field, two tennis courts, basketball courts, picnic shelters, a recreational lake, and a playground. Swimming is not permitted at McLean Lake.

North Myrtle Beach Central Park contains baseball and football fields, 4 tennis courts, a picnic area, a playground and restrooms. Two additional fields are in the works.

The North Myrtle Beach Community Center offers an enclosed space for a variety of recreational functions and entertainment.

There are numerous commercial recreation opportunities in North Myrtle Beach. Centrally located is the Amusement Park at Highway 17 and Main Street in the section formerly called Ocean Drive. Adjacent to this is a very popular water slide operation. There are numerous miniature golf operations and similar facilities dispersed throughout the more commercial areas of North

Myrtle Beach. Outlet shopping is also a popular tourist pastime, as evidenced by the wide variety of operations in the area.

#### A.2 Seasonal Use and Capacities

Consultations with the Chamber of Commerce at North Myrtle Beach and with selected business people in the area indicate that most public and commercial recreational facilities could easily absorb a 100 percent increase in patronage. Based on previous and current surveys, this additional capacity would easily accommodate any individuals and families who wished to remain in the North Myrtle Beach area in the event of an oil spill. Moreover, North Myrtle Beach is surrounded by numerous golf courses, marinas, and other recreational opportunities which do not lie within its corporate boundaries. Additionally, the more intensively developed City of Myrtle Beach lies directly to the south with even more numerous opportunities for recreation which would not necessarily be water-oriented. Among these are extensive amusement and golfing opportunities, the Waccamaw Pottery/Outlet Complex, and a full range of recreational opportunities which the larger tourism area can offer.



B. TOURIST INDUSTRY  
VULNERABILITY

## B.0 VULNERABILITY OF NORTH MYRTLE BEACH'S TOURISM INDUSTRY TO AN OIL SPILL

The vulnerability of North Myrtle Beach's tourism industry to an oil spill is directly related to the dependence of the industry on beach and water-oriented activities. Critical factors include the length of beach which may be affected by an oil spill, the vulnerability of the local economy, and the seasonal nature of the tourist trade. The potential extent of beach affected by a spill is discussed in other Tasks. Information concerning the other critical factors was developed through a combination of two sources. First, data concerning the contribution of tourism to the Grand Strand economy, particularly North Myrtle Beach, were gathered from available sources. This information was used to assess the value of tourism to the North Myrtle Beach area economy. Second, surveys of North Myrtle Beach businesses and visitors were conducted. From these two surveys, more information was gathered, including the percentage of beach-oriented visitors, their reaction to a potential oil spill, the seasonal nature of the tourist trade would mean to business in the Grand Strand Area.

### B.1 The Grand Strand Tourism Industry

Tourism is the area's most important economic activity; indeed, it is the economic base of the community. According to figures provided by the Horry County Development and Tourism Commission, tourist spending accounted for 73 percent of the Grand Strand Area's total economic activity in 1980. In fact, Grand Strand tourist spending exceeded \$700 million during 1980.

#### B.1.1 Impact on the North Myrtle Beach Economy

"New" or "outside" money added to the area's economy by tourism is vital to public well-being. The true significance of tourist sector spending is evident from the impacts of the multiplier effect. It is estimated that every "new" dollar brought into the area generates four additional dollars in other economic activities. To illustrate, money spent by visitors for lodging, food, entertainment, automobile services, gifts, and other purchases is filtered to other sectors of the economy. Funding packages for the construction of tourist and related commercial establishments also promote local spending. Examples of such construction include golf courses, service

and retail outlets, and general recreation and amusement areas. As total tourist visits and expenditures have increased, the construction of additional lodging facilities has kept pace. As new facilities are staffed and become operational, the area payroll is increased through direct wage payments and subsequent spending and respending cycles.

### B.1.2 Tourist Spending

Grand Strand tourist spending, as mentioned previously, exceeded \$700 million in 1980. Taxable retail sales for the Grand Strand Area during this year totalled \$258,626,000. This figure represents a 221 percent increase from the 1968 level of \$117,025,000. In the six years prior to 1980, the leisure industry along the Grand Strand showed a constant growth of approximately 12 percent per annum.

Total visitors to the Grand Strand Area in 1980 numbered 7,000,000. Per capita spending totaled approximately \$100. There were 47 million overnight accommodations throughout 1980, with over 60 percent taking place in the summer season. The average length of stay per tourist was 4.3 days resulting in an average daily tourist expenditure of \$23.26. During the summer season of 1980, the peak overnight accommodations for transient persons totalled 228,000. This resulted in expenditure exceeding \$5,000,000 on these days of tourist activity.

### B.2 Survey of Tourists

A survey of tourists who regularly vacation in the Grand Strand Area was conducted in order to give some qualitative perspective to visitors' attitudes and to determine how tourist visits might be affected by an oil spill. The questions posed to the visitors can be separated into two groups: (1) those designed to provide background information on the tourist and (2) questions concerning the visitors' response to a theoretical oil spill.

The first set of questions concerned the primary purpose for the visit. The second set addressed alternatives to water-oriented activities that might be of interest to the visitor. The answers to these questions indicate the non-water-oriented activities that are appealing to tourists whose primary purpose for visiting is water-related.

### B.2.1 Conduct of the Study

The original survey was conducted during the early winter of 1982 with a supplemental study conducted during June 8, 1984. In the original survey it was determined that surveying winter tourists in the Grand Strand Area would be biased toward golfers and others not particularly interested in water-related activities. It was therefore decided that a telephone survey using lists provided by the Myrtle Beach Area Chamber of Commerce would be most reliable. These lists contained names of people who had either vacationed on the Grand Strand in the past or had requested information packets from the Chamber of Commerce. It was estimated by the Chamber's Director that roughly 80 percent of those requesting information eventually visit the Grand Strand Area. Names from these lists were randomly selected and the individuals were interviewed by telephone. It was believed that this survey method would provide a more varied sample.

Supplemental surveys were conducted of individual tourists at North Myrtle Beach motels during the early part of June, 1984. Also surveyed were selected businesspersons in North Myrtle Beach.

### B.3 Visitor Survey Results

A survey was conducted to gather information on the following points of interest:

- A general background on visitor trips including frequency, average stay, and purpose.
- Visitor reaction to an oil spill.

The visitor survey provided a good sampling of annual visitation frequencies and average lengths of stay but was dominated by beachgoers as opposed to golfers and other nonbeach patrons. The survey revealed a general similarity between visitor responses and businessperson responses to a subsequent survey regarding expected reactions to an oil spill. Less than one-fourth of the tourists said their vacation at North Myrtle Beach would continue uninterrupted in the event of an oil spill, and most businesspersons believed a maximum continued stay of two to three days could be expected before an appreciable tourist outflow following an oil spill would occur.

The business survey also verified an expected short-term decline of tourist patronage from the viewpoint of businesspersons. Specific financial impacts were not estimated.

### B.3.1 Visitors' Origin

Current or former visitors surveyed reside in 14 states and the Canadian Province of Ontario. North Carolina and South Carolina together accounted for 31 percent of those surveyed. The home states of those interviewed is shown in Table 1.

### B.3.2 Trips Per Year

Grand Strand trips taken annually range from 1 to 12. Forty percent (40 percent) of respondents average one trip per year, and 16 percent of respondents make 2 visits to the Grand Strand Area.

### B.3.3 Time of Year

The most popular time of year to visit the Grand Strand is, as expected, the summer months. A significant number of the respondents also make trips during the spring and fall. Those who visit in the summer exclusively or as one of multiple annual trips account for almost 60 percent of respondents.

### B.3.4 Length of Stay

More than 62 percent of those surveyed replied that their average length of stay is between one and two weeks. Twenty percent (20 percent) from two to five weeks during any one of their Myrtle Beach stays. The remaining 18 percent said their visits are usually 3-5 days.

### B.3.5 Primary Purpose for Visit

All of the persons interviewed said the principal reason for visiting the area is to enjoy the beach and ocean. A number of them added that, although they do not actually spend time on the beach, it is still the primary area attraction. For 38 percent of them, camping is the second most important reason for visiting the area. Golf and tennis is the third most popular attraction, while fishing places are a close fourth.

### B.3.6 Alternative Activities

This section of the visitor survey concerned the alternative non-water-oriented activities that people might consider if the beach were off

limits for a period of several days during their vacation. The people interviewed were given a scenario in which an oil spill occurred during the middle of their vacation. They were then asked if there were some alternative activities in the Grand Strand area in which they might be interested. Assuming that the spill cleanup would last 3-4 days, the tourists were given the following attractions now existing in the area as possible activities for participation:

- Golf/tennis.
- Deep sea fishing.
- Excursions to sites of cultural/historical interest (Brookgreen Gardens, Georgetown, Charleston, etc.).
- River cruise of plantations.
- Convention center activities (i.e., antique show, boat show, etc.).
- Other activities.

Of all the people interviewed, 91 percent felt that there was at least one alternative activity in which they would be interested. Of the 91 percent that did not designate an alternative activity of interest, three-fourths were from South Carolina and the other fourth from North Carolina. These Carolina respondents average from 7 to 12 trips to the Myrtle Beach area annually. Half of them felt they would definitely cut their visit short and one-fourth thought an early departure was highly probable, but the remaining one-fourth would not leave early.

The most popular activity mentioned by those surveyed was the excursion to sites of cultural/historical interest. Seventy-eight percent (78 percent) said they would be interested in that type of activity. A river cruise of plantations would be popular with 58 percent of those surveyed. Under the category of other activities, shopping in the area was mentioned by 65 percent of those surveyed. Golf/tennis was chosen by 29 percent, deep sea fishing by 20 percent, and activities at the Myrtle Beach Convention Center by 4 percent. In most instances, three or four different alternatives were designated. Eleven percent (11 percent) of the respondents designated only one alternative activity.

### B.3.7 Probability of Reducing Length of Visit

This section was designed to give some indication of how visitors would react to an oil spill. Interviewees were asked whether an oil spill would cause them to cut their Grand Strand stay short. Although 24.4 percent said there was no possibility of cutting a visit short if an oil spill occurred, more than 75 percent said that there would be some probability of shortening a visit. Close to 100 percent of those supplemental surveys conducted during the summer of 1984 said they would seriously consider cutting short their vacations.

### B.3.8 Summary of Visitor Survey

The survey indicated two important visitor reactions if an oil spill occurred:

- 1) A major percentage 75.6 of the visitors surveyed said they would consider (to varying degrees) cutting short their Grand Strand vacation in the event of an oil spill.
- 2) There are one or more alternative activities in the area that the tourists would enjoy if restricted from beach use.

### B.4 Survey of Businesses

A survey of business located in the Grand Strand area was undertaken with a twofold purpose. One purpose was similar to that of the visitor survey--that is, to predict what effect an oil spill might have on visitors. The assumption made was that persons who are in the business of serving tourists would have some insight into tourist behavior and attitudes by exposure and because it is the nature of their business to predict tourist behavior. The second purpose was to determine the effects of a short-term decline of tourism on specific types of businesses, facilities, or activities.

The businesses were asked to establish the seasonal pattern of their business as it relates to dependence on tourism. They were also asked to estimate the percentage of tourists they felt could be lost for a brief period of time as a result of an oil spill without imposing financial hardship on the business.

#### B.4.1 Business Survey Results

The business types that responded to the questionnaire fall into three primary categories: hotel/motel, retail, and amusement. Fifty-nine percent (59 percent) of the respondents are engaged in retail business, including shopping centers. Thirty-five (35 percent) percent of the business are either hotels or motels. The remaining six percent of respondents are in the amusement business. Eighty-two percent (82 percent) of the businesses responded that their busiest sales period is from June to September. Twelve percent (12 percent) indicated longer busy periods of from 6 to 9 months. Shopping centers replied that business remains fairly stable year-round.

#### B.4.2 Percentage of Tourist Customers

As expected, almost all of the businesses surveyed indicated that a large percentage of their customers are tourists, at least during certain times of the year. Shopping centers represent one business type that is not completely dependent upon the tourist trade. Even during the summer months, shopping center managements estimate that only 20 percent of their customers are tourists. However, at the other extreme are 12 percent of the businesses that estimate 100 percent of their customers to be tourists throughout the year.

#### B.4.3 Tourist Trade That Can Be Lost

The respondents were asked to estimate how much their tourist trade can drop before losses will be incurred. Not surprisingly, the declines are very small. Fifty-three percent (53 percent) of the businesses can afford no decline in trade. The other respondents are able to withstand a limited decline, provided the decline does not occur in the June-August period. Most tourist-related businesses depend on the summer trade to overcome income deficiencies during other times of the year. In these cases, any business decline will have negative effects.

Along these lines, the businesses were asked to estimate the period of time that beach-related activities could be restricted before the business would operate at a loss for the year. The responses fell into four time periods:



- 1) No Time - Eighteen percent (18 percent) of the respondents did not feel their businesses could afford beach use being restricted for any length of time.
- 2) 2-3 Days - Thirty-five percent (35 percent) of the businesses felt the beach could be closed for two or three days before they incurred financial difficulty.
- 3) 1 Week - Twenty-nine percent (29 percent) responded they could withstand closed beaches for one week.
- 4) 2-3 Weeks - Eighteen percent (18 percent) of the respondents indicated their business could handle this relatively long period of restricted beach use.

#### B.4.4 Summary of the Business Survey

The survey of Myrtle Beach businesses produced a consensus: businessmen are justifiably frightened by the prospect of a spill. This is particularly the case considering the possibility of a spill occurring during the peak summer season. A number of the people surveyed felt that an oil spill could be devastating. Their primary concern is the handling of the incident by the news reporting media. It is felt to be of the utmost importance that the media be kept constantly abreast of what occurs during and after an oil spill since the type of publicity that the area receives can make or break the business community.

Other points brought out in the survey include the following:

- Largest volume of customers occurs during the summer season.
- Most businesses are heavily dependent upon tourists as customers, at least during the spring, summer, and fall seasons.
- Very little of this tourist business can be lost without serious economic impact.
- The businessmen do not believe that tourists will stay in the area for very long if an oil spill occurs.



## C.0 CLEANUP GUIDELINES

### C.1 Properties of Spilled Oil

Petroleum products are transported in a variety of forms from crude oil to gasoline. Each form of oil has a specific set of chemical and physical properties which affect their interaction with water and sediments. Weathering processes, water/sediment residence time, environmental damage, and ultimately cleanup and recovery methods vary greatly with each type of oil. A list of oil types and the effects each will have on the shoreline environments present along North Myrtle Beach has been presented in Section 5.

Light, volatile oils (gasolines, kerosines, diesels, etc.) tend to spread over the water surface very rapidly. Almost immediately, evaporation and photooxidation begin to "weather" or break down the oil, eliminating as much as 45 percent of the volume in 24 hours. Lighter oils also tend to be more soluble and the oil is easily mixed into the water column. As a result, oil reaching the beaches often appears as a light multicolored sheen. It may penetrate into sandy sediments if large enough quantities are present, but will be removed quickly by agitation from wave activity. Aesthetically, at least, a spill of this type would be least damaging to the North Myrtle Beach shoreline. Depending on the amount of petroleum spilled, it may go largely unnoticed visually and may take only a few hours to a few days for the beaches to be free of oil accumulation.

Heavier oils, (crudes, bunkers and residual products) create a more complex impact problem for the North Myrtle Beach shoreline. When the oil is spilled into seawater, it can form either an oil-in-water (o/w) or a water-in-oil (w/o) emulsion. The o/w emulsion (more common with lighter petroleum products) is distributed throughout the water column and is exposed to degradation processes. Conversely, w/o emulsion (called "mousse") generally forms from heavier petroleum products and is more resistant to weathering. The emulsion floats and is viscous enough to retard evaporation. Further, the emulsion has twice the volume of the original oil, is very stable, and assumes a rather sticky, taffy-like viscosity that readily adheres to most substrates.

With heavier oils, impact to the North Myrtle Beach area shoreline is potentially far worse aesthetically and physically than lighter oils. In smaller spills, oil would tend to accumulate along the upper beach face where it may percolate into the sediment. With larger spills where vast quantities of

oil may be deposited on the shoreline, the oil will accumulate in both the upper and lower intertidal zones. There is a greater likelihood that oil would become more deeply incorporated into the beach face as sediment reaches saturation levels. In either case, once oil impacts the shoreline, it renders the beach unusable to tourists until it has been removed.

## C.2 Guidelines for Shoreline Cleanup

The primary shoreline types of the North Myrtle Beach area are:

- Exposed Vertical Seawalls
- Fine-grained Sand Beaches
- Exposed Tidal Flats
- Exposed Riprap Structures
- Sheltered Coastal Structures
- Sheltered Tidal Flats and Oyster Beds
- Marshes

The following tables outline various methods to clean oil from the shoreline types found in North Myrtle Beach. The format is based on guidelines produced by the American Petroleum Institute.

### EXPOSED VERTICAL SEAWALLS

#### Preferred Response:

Booms	Use to divert and collect oil before it comes shore.
Skimmers	Avoid trampling of biota during placement of equipment.
Natural Cleansing	Useful in exposed areas.

#### Viable Response:

Low-Pressure Flushing	Valid on fresh, unweathered oil. Avoid hot or fresh water. Avoid trampling. Recover flushed oil.
Sorption	Recover oiled sorbents. Less effective on large spills.
Manual Removal	Labor intensive.
Vacuum Pumping	Avoid slopping recovered oil. Avoid sucking up biota.

Not Advisable Response:

Burning	Avoid population centers. Less effective on emulsified and weathered oil.
Dispersant	Spray offshore ahead of the oil slick. Must have adequate flushing and dilution.

Avoid Response:

High-Pressure Spraying	Use when contamination is severe.
Sand Blasting	May assist recolonization.
Steam Cleaning	Avoid trampling or dragging equipment over unoiled areas.

## FINE-GRAINED SAND BEACHES

Preferred Response:

Booms, Skimmers, and Sorbents Manual Labor	Used to divert or collect oil while still offshore. Useful to limit sediment removal. Labor intensive. Avoid contaminating clean, back-beach areas by sloppy handling techniques.
Mechanical Cleanup	Useful only on hard, flat beaches. Wait until most if not all oil has come onshore. Avoid excessive sediment removal. Avoid contaminating clean, back-beach areas.
Natural Cleansing	Particularly appropriate for most beaches of North Myrtle Beach where wave energies are moderate.
Vacuum Pumping	Useful only for thick layers of low-viscosity oils. Line sump pits with plastic to limit oil penetration into beach sediments.

Viable Response:

Dispersants	Use only on beaches of low productivity. Spray ahead of the advancing tide. Avoid contaminating adjacent areas. Do not use with sorbents.
Low-Pressure Flushing	Viable only for low viscosity oils. Only for limited areas. Use sorbent pads or booms immediately following the standing of oil. Recover all sorbent material after use.

Avoid Response:

- Burial
- Burning
- Mixing
- Substrate Removal

EXPOSED TIDAL FLATS

Preferred Response:

- Skimmers, Booms,  
and Sorbents
- Natural Cleansing

Used to control or divert incoming oil.  
Most effective on active, sandy flats.  
Will probably occur before cleanup equipment will arrive.

- Manual Removal

Most effective on oiled sandy flats.  
Avoid grinding in the oil by human or vehicular traffic.

Viable Response:

- Mechanical Cleanup

Effective on the hard flats readily accessible.  
Avoid grinding in the oil by human or mechanical activities.

- Sorption

Limited effectiveness on weathered or highly viscous oils.

Not Advisable Response:

- Dispersant

Spray ahead of advancing tide.  
Avoid overdosing.

- Substrate Removal

Do not use with sorbents.  
Remove oiled sediments only to depth of oil penetration.

Avoid Response:

- Burial
- Mixing
- High-Pressure Flushing

## EXPOSED RIPRAP STRUCTURES

Preferred Response:

Skimmers, Booms,  
and Sorbents  
Natural Cleansing

Used to divert or collect incoming oil.  
Appropriate for outer structures exposed to  
moderate to high wave energies.

Manual Collection

Use sorbent material.  
Avoid sloppy handling of oily debris.

Low-Pressure Flushing

Collect all used sorbent material.  
Collect flushed oil.  
Do not use hot or fresh water.

Viable Response:

Dispersant

Preferred only for low-viscosity oils on moderate  
to high energy structures.

Not Advisable Response:

High-Pressure Flushing

Use only as a last resort after other techniques  
have failed.

Sand Blasting

Will destroy biological community.

Avoid:

Steam Cleaning  
Substrate Displacement  
Substrate Removal

## SHELTERED COASTAL STRUCTURES

Preferred Response:

Booms

Use to divert and collect oil before it comes  
ashore.

Skimmers

Avoid trampling of biota during placement of  
equipment.

Natural Cleansing

Useful only in exposed areas; generally  
ineffective for North Myrtle Beach areas.

Viabale Response:

Low-Pressure Flushing	Valid on fresh, unweathered oil. Avoid hot or fresh water. Avoid trampling. Recover flushed oil.
Sorption	Recover oiled sorbents. Less effective on large spills.
Manual Removal	Labor intensive. Avoid slopping recovered oil.
Vacuum pumping	Avoid sucking up biota.

Not Advisable Response:

Burning	Avoid population centers. Less effective on emulsified and weathered oil.
Dispersant	Spray offshore ahead of the oil slick. Must have adequate flushing and dilution.

Avoid Response:

High-Pressure Spraying	Use when contamination is severe.
Sand Blasting	May assist recolonization.
Steam Cleaning	Avoid trampling or dragging equipment over unoiled areas.

## SHELTERED TIDAL FLATS AND OYSTER BEDS

Preferred Response:

Skimmers, Booms, and Sorbents	Particularly important in controlling or diverting the spill before it enters this habitat.
Dispersants	To be applied for offshore to prevent oil from entering this habitat.
Natural Cleansing	Applicable only along the flats where waves are present.

Viabale Response:

The soft muds of this habitat make access and cleanup extremely difficult. Most operations involving men and machinery will only grind the oil deeper into flat sediments, thereby increasing oil persistence and biological damage. Because of this, it is even more important to have available an effective offshore response for large spills.



Not Advisable Response:

Manual Removal	Extremely difficult due to very soft substrate. Will grind oil deeper into sediments and disturb biota.
Sorption	Difficult to apply and collect after use because of the soft substrate.
Low-Pressure Flushing	Can apply and collect from boats offshore. Difficult to gain access to the flat. Flushing will resuspend sediment and oil, which should be collected from shall-draft boats.
Substrate Removal	Difficult due to lack of cohesive sediments and will destroy biota.

Avoid Response:

Burial  
 Mixing  
 High-Pressure Flushing  
 Sediment Displacement

## MARSHEs

Preferred Response:

Skimmers, Booms, and Sorbents	Particularly important in controlling or diverting the spill before it enters this habitat.
Dispersants	To be applied far offshore (with USCG permission) to prevent oil from entering this habitat.
Natural Cleansing	Applicable only on light oil coatings.

Viable Response:

Manual Removal	Use with extreme caution not to grind oil deeper into sediments. Should be used only for moderate to heavy oil concentrations.
Low-Pressure Flushing	Use seawater; avoid trampling. Flushed oil should be collected using sorbents and shallow draft vessels.

Not Advisable Response:

Enhanced Biodegradation Requires fertilizers to sustain bacterial activity;  
takes too long.  
Vegetation Cropping Cutting reduces plant growth rates during  
recovery.  
Avoid grinding oil deeper into sediment.

Avoid Response:

Burial  
Mixing  
High-Pressure Flushing  
Sediment Displacement  
Sinking Agents



## D.0 DISPOSAL GUIDELINES

Recovered spilled oil, contaminated soil, and cleanup materials require proper disposal. If not carefully planned, this disposal can pose immediate and long-range problems. Improper disposal methods can result in a secondary environmental problem--essentially, another spill. Under optimal conditions, disposal sites and methods should be carefully thought out in advance.

Under all circumstances, approval of the site and method of disposal must be approved by DHEC. As a general guideline, the following disposal techniques may be considered.

### D.1 INCINERATION

Incineration of oily waste is a common practice in many parts of the world using either advanced-technology stationary units or portable field stations. These units are able to cleanse debris, soil, and water of:

- a) Crude bunker fuel, distillates, table oils, waste oils, etc.
- b) Several types of hazardous wastes.
- c) Viscous liquids and mixtures such as paint, creosote, monomers, and partially polymerized plastics.
- d) Waste, sludge, and bottoms from chemical and petrochemical industries.
- e) Pesticides.
- f) Shreddable and combustible containers.

Preferably, material should be placed into an approved incinerator or one designed to withstand very high temperatures (1200°F or 650°C). A second alternative is the burn box method which utilizes a contained box, such as an old dump truck bed or solid waste receptacle. The burn box is simply filled with material and ignited; however, water may have to be drained to maintain burning. The incineration process is repeated until all materials are reduced to ashes.

### D.2 SANITARY LANDFILL

Oily debris of any sort may be disposed of at any properly designed and operated sanitary landfill. However, leaching of oily water is a particular problem especially in regions of high rainfall. In some cases, ignition of oily debris may occur. Installation of a proper bottom seal or liner (e.g.,

bentonite or clay) is a necessity in all cases. Possible problems and solutions with sanitary landfill procedures are presented below.

Possible Problem	Solution
<ul style="list-style-type: none"> <li>° Oil not absorbed by refuse. Oversaturated mass. Undersaturated mass.</li> </ul>	<ul style="list-style-type: none"> <li>° More mixing with refuse until adequate mix is secured.</li> </ul>
<ul style="list-style-type: none"> <li>° Ignition of oily debris/refuse mass.</li> </ul>	<ul style="list-style-type: none"> <li>° Extinguish flames: prevent by installing spark arrestors on equipment and assuring they have mufflers above equipment.</li> </ul>
<ul style="list-style-type: none"> <li>° Leaching of oil into ground water (ground water flows through refuse).</li> </ul>	<ul style="list-style-type: none"> <li>° Reduce groundwater level by trenching or pumping. Excavate material and install liner.</li> </ul>
<ul style="list-style-type: none"> <li>° Leaching of oil into ground water (vertical migration down through bottom).</li> </ul>	<ul style="list-style-type: none"> <li>° Dig up landfill and reseal bottom.</li> </ul>
<ul style="list-style-type: none"> <li>° Erosion of cover soil.</li> </ul>	<ul style="list-style-type: none"> <li>° Reduce percolation by improving cover material: slope surface to encourage runoff.</li> </ul>

### D.3 LAND CULTIVATION

Land cultivation is a viable method in areas with sufficient soil depth (10-15 cm) and where surface slopes do not exceed 6 percent. With this method, naturally occurring bacterial populations will multiply satisfactorily to decompose the oily debris. Decomposition will vary with extent of oil/soil mixing, oxygen content, moisture, nutrients (primarily nitrogen and phosphorous), and pH conditions. Land cultivation should be avoided in areas of washouts or flooding.

The procedure for land cultivation includes:

- a) Spreading of debris evenly on the oil surface in a layer 3-13 cm thick. In some areas, the oil is allowed to weather for several weeks before stage (b).
- b) Mixing the oil thoroughly into the soil with a rototiller, plow, or discs. At least two complete passes over the site at right angles are necessary.
- c) Further mixing at increasing intervals (from weekly at first, to seasonally after two years) greatly increases the rate of composition.
- d) Adding fertilizer may be necessary to aid bacterial growth.
- e) Planting may be necessary to stabilize the treated area.

#### D.4 BURIAL (ANAEROBIC)

Burial of oil spill debris without refuse usually requires excavation of a pit or trench for disposal. In some cases, however, the oil spill debris can be contained within a berm mounded aboveground and covered with soil, with little or no excavation involved. Burial aboveground may be preferable since any lateral leakage can be readily observed without subsurface exploration. Alternative layering of oil spill debris and soil is usually employed in any burial disposal operations.

As in sanitary landfilling, the debris is sequestered under cover, greatly reducing or eliminating the possibility for aerobic microbial decomposition of oil. Burial may involve more site preparation and longer term monitoring, but eliminates the subsequent mixing required of the land cultivation method.

Land requirements for landfilling without refuse will depend upon:

- a) The volume of debris generated by the oil spill.
- b) The depth and lateral extent to which the site can be excavated.
- c) The particular burial method selected.

As with sanitary landfills, loss of an oily leachate is a major problem. Usually layers of debris and soil are alternated and compacted. Encapsulation of the oily debris minimizes volatilization. Because the oil remains undegraded for long periods, there will always be the potential for long-term pollution. Monitoring on the burial site is necessary.

#### D.5 THE SOLIDIFICATION/ENCAPSULATION PROCESS

This process has gained very wide acceptance in Europe and recently in Canada. It consists of treating all types of hydrocarbon wastes with a special lime-based material. The end product is a hydrophobic clay with encapsulated oil, gray in color with little smell or feel of the original waste oil. This end product has been very satisfactorily used as a road-building material when compacted. The treatment is exothermic, but poses no health or pollution problems. In Europe, this process has proven immensely successful in treating 1,500 m<sup>3</sup> of lignite tar in West Germany; 4,000 m<sup>3</sup> of heavy fuel oil in Austria; 41,000 m<sup>3</sup> of acid tar in Dollbergen, West Germany; and 22,000 m<sup>3</sup> of refinery sludge in France. The process has undergone extensive government testing and has been found to have few leachate or pollution problems.



# Contingency Plan for Spills of Oil and Other Hazardous Substances



**South Carolina Department of Health and Environmental Control  
Second Edition 1980**



Prepared by Special Services Section  
Water Surveillance and Laboratory Analysis Division  
DHEC—027 12/80

Simplified Procedure for Reporting  
a Spill of Oil and/or Hazardous Material

Initial Observer

1. Spiller
2. S.C.D.H.E.C. field personnel
3. EPA or USGC
4. Citizen
5. Other state or local government agency

S.C. Dept. of Health and Env. Control Contact

Twenty-four (24) hr. emergency number 803-758-5531

U.S. Government Contact

Twenty-four hr. emergency no. 1-800-424-8802

Information to Report by Telephone

Location of spill

Source of spill

Time of spill

Volume of spill

Potential hazard of spill

Has containment been accomplished

Has spill material reached a body of water

Responsible party(s) (name, address, telephone  
number, official to contact, etc.)

Weather conditions at spill site

## Introduction

The State Contingency Plan has been prepared in coordination with the National Contingency Plan and supersedes any previously published State Contingency Plan for Oil and Hazardous Material Spills. It is designed to serve as a working document in response to spills of oil and hazardous materials.

Authority. This State Contingency Plan has been developed in compliance with Section 48-43-540 of the South Carolina Code of Law, 1976, as amended.

## Purpose and Objectives

Spill prevention is the best possible method of controlling spills of oil and hazardous material. This thought is the focal point in the preparation of this plan and is stressed by encouraging all individuals who handle such materials to prevent spills through planning, good house-keeping, adequate equipment, proper maintenance and safe operation of related equipment. Should a spill of oil or other hazardous material occur, immediate action by all responsible parties and jurisdictional agencies is required. Therefore, the purpose and objectives of this Contingency Plan are:

1. To encourage industry and transportation to eliminate spills.
2. To establish a simple, effective procedure for reporting spills so that the first observer of a spill incident can initiate the alert, thus, insuring the earliest possible notice to the appropriate State and Federal agencies.
3. To designate a State Response Team and a State On-Scene Coordinator (SOSC) who have the ability to alert and coordinate the resources of manpower, equipment and materials, and to

supervise the control, containment, clean-up and disposal of spills, in cooperation with other state agencies.

4. To provide for efficient, coordinated and effective action to minimize environmental damage from oil and hazardous substance discharges, including containment, dispersal (if necessary), removal and disposal.
5. To develop a system which will allow the State of South Carolina to be reimbursed for reasonable costs incurred in the clean up of spills of oil and/or hazardous materials.
6. To encourage the development of local contingency planning and mutual assistance groups so that spillers themselves can take prompt, effective action in control and clean-up operation, thereby, minimizing their financial liabilities for cost of clean-up, restoration, and damage to the environment.

Scope. The State of South Carolina Contingency Plan is effective for all the waters of the state (coastal and inland). The provisions of the plan are applicable to all State Agencies referenced in Section 48-43-570 of the South Carolina Code of Laws, 1876, as amended. Implementation of the Plan is compatible with and complimentary to current State and Federal legislation.

State Policy. Section 48-43-520 of the S.C. Code of Law, 1976, as amended states: (1) The General Assembly finds and declares that the highest and best use of the seacoast of the State is as a source of public and private recreation; (2) The General Assembly further finds and declares that the preservation of this use is a matter of the highest urgency and priority, and that such use can only be served effectively by maintaining the coastal waters, estuaries, tidal flats, beaches, and public lands adjoining the seacoast in as close to a pristine condition

as possible, taking into account multiple use accommodations necessary to provide the broadest possible promotion of public and private interests.

(3) Further, The 1976 S.C. Code of Laws as amended, Section 48-1-20 states:

"It is declared to be the public policy of the State to maintain reasonable standards of purity of the air and water resources of the State, consistent with the public health, safety, and welfare of its citizens, maximum employment, the industrial development of the State, the propagation and protection of terrestrial and marine flora and fauna, and the protection of physical property and other resources. It is further declared that to secure these purposes and the enforcement of the provisions of this act, the Department of Health and Environmental Control shall have authority to abate, control and prevent pollution."

Statewide Notification Procedures for Spills of Oil and Other Hazardous Substances.

The notification process developed here establishes mobilization procedures for the South Carolina Department of Health and Environmental Control Emergency Response Team personnel in response to reports of spills of oil and other hazardous substances occurring in this State.

It is the responsibility of the first person notified of a spill incident to initiate proper notification procedures within the South Carolina Department of Health and Environmental Control (SCDHEC). This notification should be through his immediate supervisor if readily available, then to a member of the Emergency Response Section of the Division of Biological, Stream and Facility Monitoring, and Emergency Response of the South Carolina Department of Health and Environmental Control

(803-758-5531). The State On-Scene Coordinator and the Emergency Response Team shall determine that the following are executed properly:

- (1) source control and containment of the pollutant;
- (2) protection of the environment;
- (3) cleanup, recovery, and disposal of the pollutant.

State On-Scene Coordinator (OSC) for spills of Oil and Other Hazardous Substances.

The Manager of the Emergency Response Section, SCDHEC, shall be the State On-Scene Coordinator (SOSC) unless otherwise designated by him or the Deputy Commissioner of the Office of Environmental Control.

The SOSC's so designated have jurisdiction over all spills of Oil and Other Hazardous Substances within the State Boundaries. In the event that the spill is of the nature requiring the U.S. Environmental Protection Agency or U.S. Coast Guard to send a representative, decisions affecting the spill activities will be closely coordinated. (See Appendix III for pre-designated boundary lines between U.S. EPA and U.S.C.G.).

The SOSC shall:

Protect human life at all times.

Prevent further contamination of the environment.

Keep a chronological log of the spill incident.

Maintain progress reports for parties concerned.

Coordinate performances at the spill (such as work teams, clean-up and recovery operations, etc.).

Release the responsible party at the spill.

Protect the interest of all parties concerned.

If the SOSC determines that the spill magnitude is such that additional personnel, equipment and material are needed, he will contact other SCDHEC District Offices, other State agencies, the U.S. EPA or U.S. Coast Guard and/or industrial or mutual assistance groups in accordance with the needs and his knowledge of available resources. If, in the opinion of the SOSC, the spiller's performance is inadequate to protect the environment in any phase of the containment and clean-up, the SOSC will initiate necessary operational procedures to insure that protection. If necessary, he will augment the Emergency Response Team with any additional SCDHEC personnel required to accomplish the task. These requests will be made and/or closely coordinated with the Manager of the Emergency Response Section.

The SOSC will not be expected to know how to neutralize or decontaminate all of the thousands of hazardous chemicals that are already in existence or which may be produced in the future. If one of these chemicals is spilled, the SOSC is charged with obtaining any technical assistance or information necessary to minimize the impact of the spill. A continuing training program will be conducted to keep the SOSC and Emergency Team personnel abreast of new, safe methods of oil and hazardous material spill containment, neutralization, decontamination, clean-up, removal, and disposal.

The SOSC will keep himself informed of the availability of spill response resources in this State, adjoining States, and Federal Agencies. He should determine the availability of Vac-All trucks, septic tank pumpers, and other equipment which can be readily used in clean-up operations. It is not necessary to stock readily available materials but he should be familiar with their sources in his State. Emergency Response Team personnel in District Offices will assist the SOSC in obtaining this information.

In many cases, the initial response to a spill situation is by a local, county, or state police agency or by a fire department. These agencies are requested to immediately contact the Emergency Response Team of the South Carolina Department of Health and Environmental Control (803-758-5531). It should be realized that by allowing spilled oil, hazardous or potentially hazardous materials to flow or be flushed to storm drainage systems, ditches or bodies of water, which often flow through populated areas, a dangerous situation may only be compounded. Emphasis is placed on containment, clean-up and proper disposal of the spilled material. When evaluating a spill incident to determine its effect on human life, containment and removal at the spill site is generally preferable to movement of the problem to some unknown and often inaccessible area where monitoring and clean-up of the spill may be impossible.

Extreme caution should be taken by the first individuals arriving at a spill site. All effort should be made to identify the spilled material before exposing oneself or others to the material. A general listing of spill handling procedures is located in Appendix 4.

Emergency Response Team for Spills of Oil and Other Hazardous Substances

Personnel of the Office of Environmental Quality Control, SCDHEC, are designated Emergency Response Team members. They will serve at the direction of the SOSOC. The SOSOC is charged with maintaining a current list of Emergency Response Team members home telephone numbers to be utilized when additional manpower is necessary to minimize environmental damage which might result from spills of oil and/or other hazardous substances.



A twenty-four answering service is maintained by the State and Federal agencies for emergency situations only (Figure 1). Current listings of home phone numbers shall be maintained by the answering service to assure immediate response by personnel so designated.

Procedure for Reporting Spills

Anyone observing or having knowledge of a spill of Oil and/or Other Hazardous Substance within the State or its contiguous waters must immediately notify the South Carolina Department of Health and Environmental Control (SCDHEC), U.S. Environmental Protection Agency (EPA) and/or the United States Coast Guard (USCG). These agencies have twenty-four (24) hour emergency telephone numbers:

SC Environmental Control Element, Columbia, S.C.	803-758-5531
Environmental Protection Agency, Atlanta, GA	404-881-4062
U.S. Coast Guard at Charleston, S.C.	803-724-4218
After 4:30 PM and Week-ends	803-723-5602
U.S. Coast Guard at Savannah, Georgia	912-232-4353
(After 4:00 PM and Week-ends)	912-786-4106
National Response Center Washington, D.C.	
Toll Free Number	1-800-424-8802

As much pertinent information as possible should be given, including:

- Location of spill
- Source of spill
- Time of spill
- Volume of spill
- Nature and potential danger of spilled material
- Anticipated movement of spill
- Responsible party(s) (include address, phone number, and personnel)

## Action already taken and anticipated

### Weather conditions at spill

The South Carolina Department of Health and Environmental Control, upon receipt of a spill notification, shall initiate proper and immediate response action to assist at the spill site (Figure 2). Notification shall be made by the agency to all other persons, agencies, industries and/or businesses throughout the State, who could possibly be affected by the spill. In cases in which the spill material may have a detrimental effect on air quality and/or threaten drinking water supplies, notification is made to the proper program area within the Department by the State On-Scene coordinator or his designee.

Notification of this reporting procedure, along with telephone numbers for alert, shall be distributed to all police and fire stations, County Sheriff Departments, Government Agencies, industries and businesses which may have use for the enclosed.

### Spill Containment and Cleanup

It is the responsibility of the spiller to properly contain and cleanup the spill in a timely and diligent manner. Containment involves building dikes, deploying booms and other barriers to prevent the spread of the pollutant, limiting access to only authorized persons if a hazardous situation exists, and other measures to minimize health and environmental damage.

Removal of the spill material from the site usually involves physical measures such as skimmers, sorbent materials, and other mechanical means of removal. Vacuum trucks are an ideal means of removing quantities of the pollutant pooled behind a barrier, with the exception of pollutants with a very high or very low viscosity. In circumstances in which extreme fire danger, other unusually hazardous circumstances exist or severe

environmental damage may result from physical cleanup, other cleanup methods may be employed as approved by the SOSOC.

#### Disposal

Disposal of the pollutant and/or pollutant contaminated material will be in a manner and location as approved by the South Carolina Department of Health and Environmental Control.

#### Cost Recovery

In very unusual circumstances, the containment and cleanup of a spill may be done by the SCDHEC. If a spill is from either an unknown source or if the spiller is unable or unwilling to take the proper actions to contain and/or remove the spill, and the spill is not reaching a body of water, the State On-Scene Coordinator has the authority to activate any or all portions of the Emergency Response Team in order to accomplish spill cleanup activities. Personnel from other State or Federal Agencies and/or private spill cleanup contractors may also be requested to assist in the containment and cleanup of the spill.

Once cleanup operations have been completed and the spiller has been identified, SCDHEC will initiate actions as specified in Section 27 of Act 179 to recover all cost incurred by the State. This availability of funds for cleanup operations by state personnel and any contracted services of private cleanup firms is contingent on the approval of a State Contingency Fund by the South Carolina Legislature. Cleanup actions cannot be authorized until these moneys are available.

Spills, as described above which enter the waters of the State, are handled identically with respect to containment and cleanup actions. However, in accordance with Section 48-43-560 of the S.C. Code of Law, 1976, as amended and the Region IV portion of the National Contingency Plan, moneys from the Federal Contingency Fund will be expended to finance the containment and/or cleanup operations.

Flow Sheet No. 1  
Numbers for Spill Notification Procedures for  
Oil and Other Hazardous Substances

Initial Observer

1. Spiller
2. S.C.D.H.E.C. field personnel
3. EPA or USCG
4. Citizen
5. Other state or local government agency

S.C. D.H.E.C. Contact\*

Twenty-four (24) hour emergency  
no. 803-758-5531

Personnel on call will be contacted  
through the answering service between the  
hours of 5:00 pm and 8:30 am on week-  
days and all day on week-ends and  
holidays

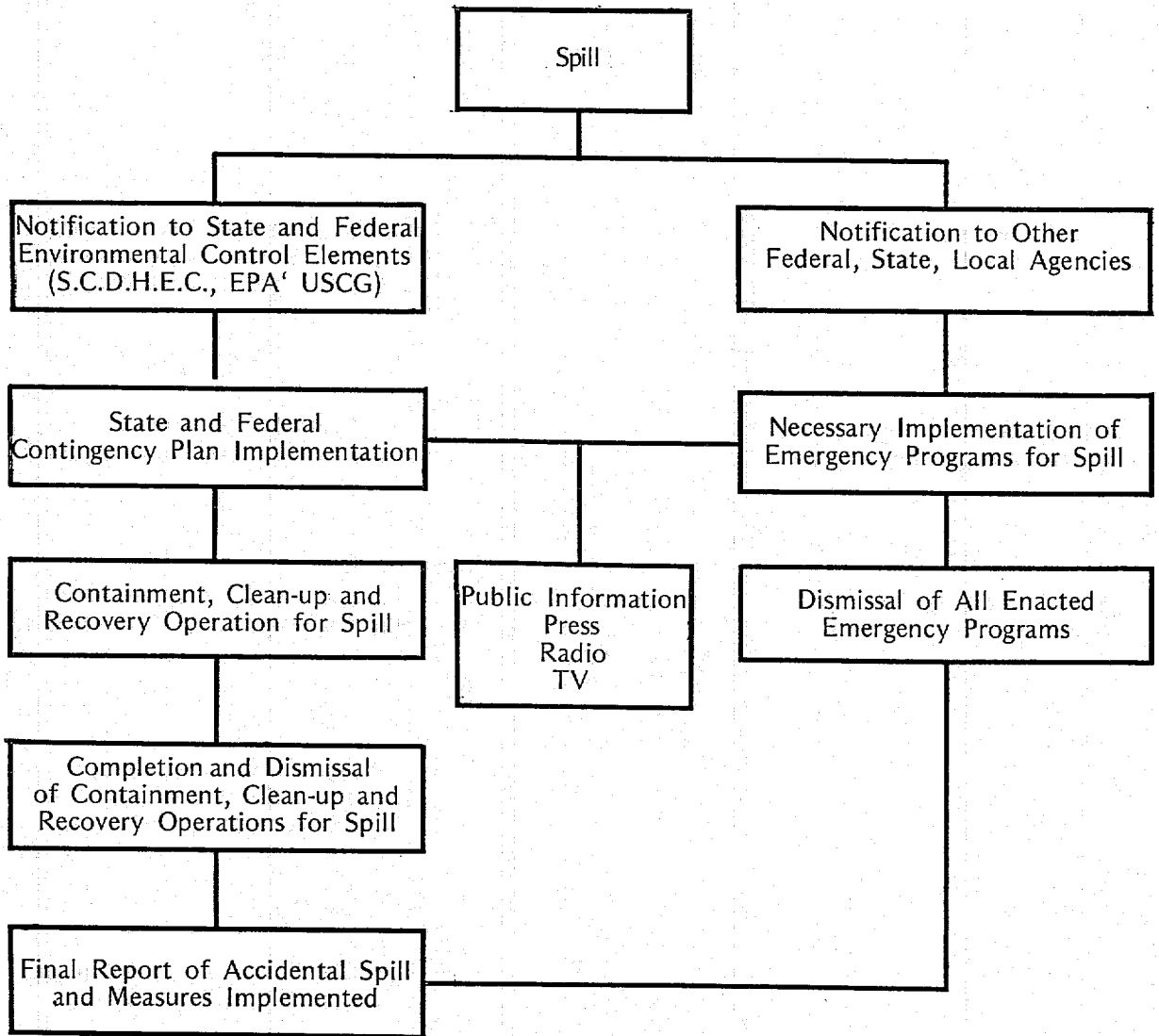
\*See Appendix for district office numbers.

U.S. Government Contact\*\*

Twenty-four (24) hour emergency  
no. 1-800-424-8802

\*\* See Appendix II for regional federal  
office numbers.

Figure No. 2  
Procedural Flow Diagram  
for Response to Spills



APPENDIX I

S.C.D.H.E.C. DISTRICT OFFICES MAY BE CALLED

Monday - Friday 8:30 AM - 5:00 PM

Appalachia I	Anderson	(803)225-3731
Appalachia II	Greenville	(803)242-9850
Appalachia III	Spartanburg	(803)582-5681
Catawba	Fort Lawn	(803)285-7461
Central Midlands	State Park	(803)758-4415
Low Country	Beaufort	(803)524-9760
Lower Savannah	Aiken	(803)648-9561
Pee Dee	Florence	(803)662-3522
Trident	Charleston Heights	(803)554-5533
Upper Savannah	Greenwood	(803)223-0333
Waccamaw	Myrtle Beach	(803)448-8407
Wateree	Sumter	(803)773-5511

APPENDIX II

REGIONAL FEDERAL OFFICE PHONE NUMBERS

- 1) Report all inland spills to EPA, Atlanta #404-881-4062
- 2) Report all coastal spills to U.S. Coast Guard:
  - A. Charleston District (Edisto River north to State line)

Daytime #803-724-4218 or 724-4710  
After 4:30 PM and weekends #803-723-5602
  - B. Savannah District (Edisto River south to State line)

Daytime #912-944-4347  
After 4:00 PM and Week-ends #912-944-4353
- 3) National Response Center - Washington, D.C. - 1-800-424-8802

APPENDIX III

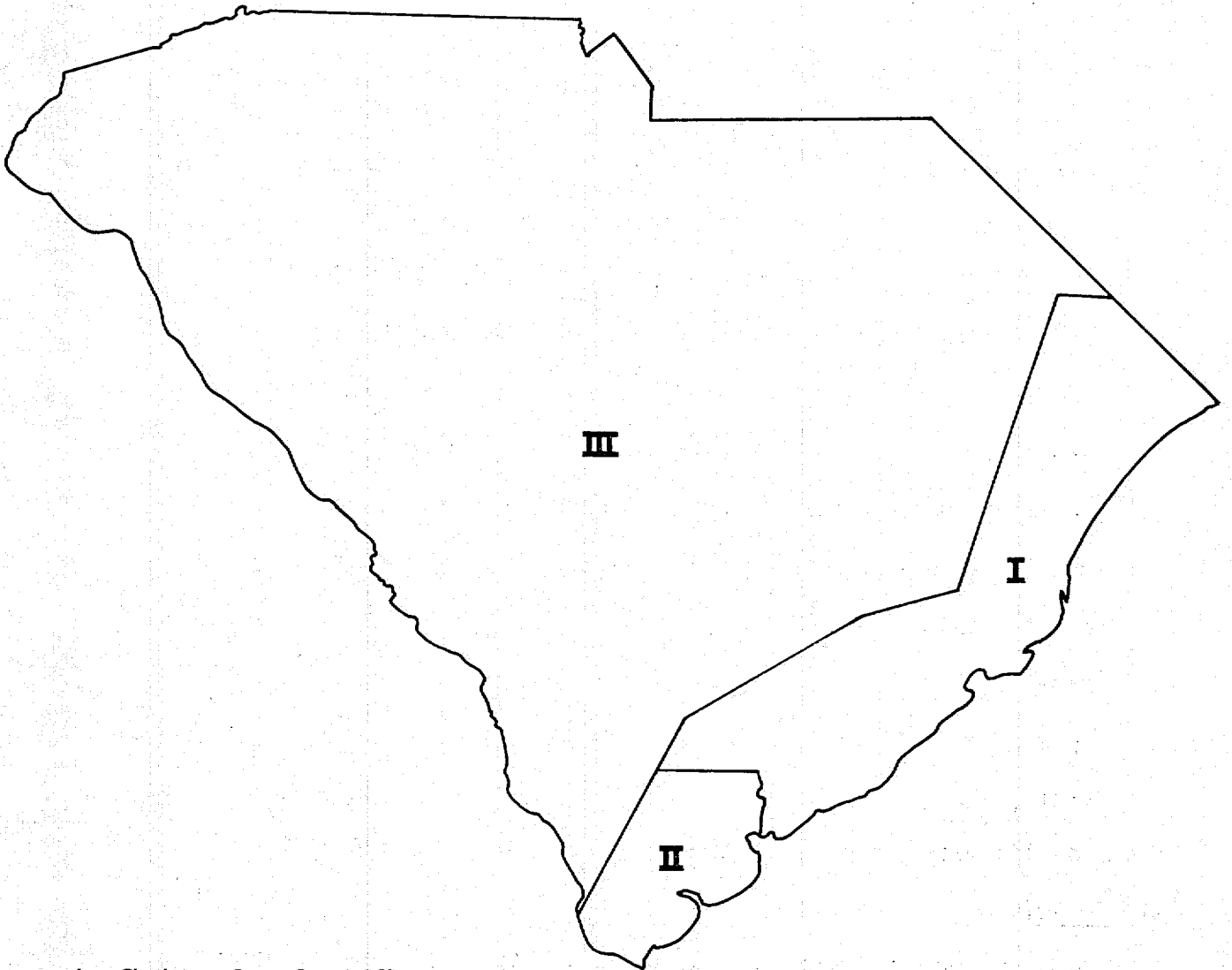
BOUNDARY LINES BETWEEN USEPA AND USCG

The USCG has Federal OSC jurisdiction over all areas of South Carolina East of a Line north from Savannah, Georgia, along I-95 to the intersection with State #63, then, east on state #63 to U.S. 17 Alt. Then northeasterly on U.S. 17 Alt to state #41 at Jamestown, S.C. Then Northerly on state #41 to U.S. 76 at Mullins, S.C. Then follow U.S. 76 Northeasterly to the N.C./S.C. Border (Figure 3).

The USEPA has OSC jurisdiction over inland spills in South Carolina west of the line, described above.

The Division of Jurisdiction between the Savannah, Georgia CG Office and Charleston CG Office is as follows: From the southern tip of Bay Point Edisto Island, South Carolina; Thence northerly along the eastern bank of the Edisto River to 32°41' N Latitude: Thence westerly to the intersection of I-95.

Figure 3  
Federal Spill Jurisdiction



- I – Charleston Coast Guard Office
- II – Savannah Coast Guard Office
- III – United States Environmental Protection Agency



## APPENDIX 4

### SPILL HANDLING PROCEDURES\*

When spilled material is not identified, assume it is hazardous and DO:

1. Rope off area, or otherwise prevent contact of anyone or anything with spilled material. If it is a gas, dust or volatile liquid, evacuate surrounding and downwind area. If a dust or powder, cover with canvas, plastic sheets or other material.
2. Provide first aid, decontaminate with soap and water, remove contaminated clothing and take anyone affected by the spilled material to the nearest emergency hospital. Note where they are sent.
3. In a safe manner, find out what the spilled material is.
4. Detain vehicle from which spill occurred. Note any contaminated cargo. Detain persons and property who have contacted spilled material.
5. Report incident to fire, police and health agencies, and ask for assistance.

When spilled material is not identified, assume it is hazardous and DO NOT:

1. Wash unidentified material off roadway into a waterway or sewer without official authorization.
2. Handle leaking container or go into truck van without full protective clothing and self-contained breathing apparatus.
3. Walk in spilled material or otherwise contaminate skin, boots clothing or vehicles.
4. Allow vehicles to ride over spill.
5. Allow anyone to eat or smoke near the spill, or provide source of ignition.

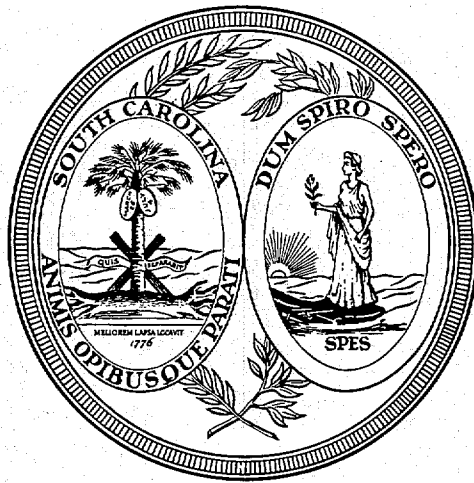
When Spilled Material is Identified DO:

1. Obtain expert advice on what the hazards are and deal with them accordingly. Health agencies, fire departments and chemical manufacturers can provide advice, assistance and information.
2. Forward the name of material to the hospital or doctor to which anyone was sent because of exposure.
3. Notify manufacturer of spilled chemical and request services of an expert decontamination team.

When Spilled Material is Identified DO NOT:

1. Attempt to clean up any toxic material without adequate protective clothing and appropriate equipment.
2. Wash any material into a waterway or sewer without official authorization.

\*California State Department of Public Health  
Bureau of Occupational Health, Berkeley, California



South Carolina Department of  
Health and Environmental Control  
2600 Bull Street  
Columbia, S.C. 29201