Six months with the NOAA Oil and Hazardous Materials Project: An Account of experiences and impressions

Submitted in partial fulfillment:
Oceanography Master of Science Degree
Marine Resource Management Program
Oregon State University
7 March 1979

Robert Pavia

The Marine Resource Management Program at Oregon State University offers a unique opportunity for study to the marine environments student. The integrated program affords a diversified experience in economics, business, social and political sciences in addition to the natural sciences. An internship which allows practical application of academic concepts is the program focal point. A description of the organizational and legal framework within which the NOAA Oil and Hazardous Material Project will furnish a basis for understanding my six month internship.

Section D of the Federal Water Pollution Control Act of 1970 establishes the national policy on oil spills. The policy states that there should be no discharge of oil or hazardous substances into or upon the navigable waters of the United States, adjoining shorelines, or into or upon waters of the contiguous zone.[1] The development of a National Oil and Hazardous Substances Pollution Contingency Plan by the Council on Environmental Quality is a requirement of section 311(c)(2) of the act.[2] The plan provides for efficient, coordinated and effective action to minimize damage from oil and hazardous substances discharges.

The plan has six sections:

A. Introduction:

   Including authority for establishment of the plan.

B. Policy and Responsibility:

   The responsibility of each federal agency is described.

C. Planning and Response Organization:

   Provides for establishment of Regional Response Teams and On Scene Coordinators.

D. Operational - Response Phases:

   Describes how spill response takes place.

E. Coordinating instructions:

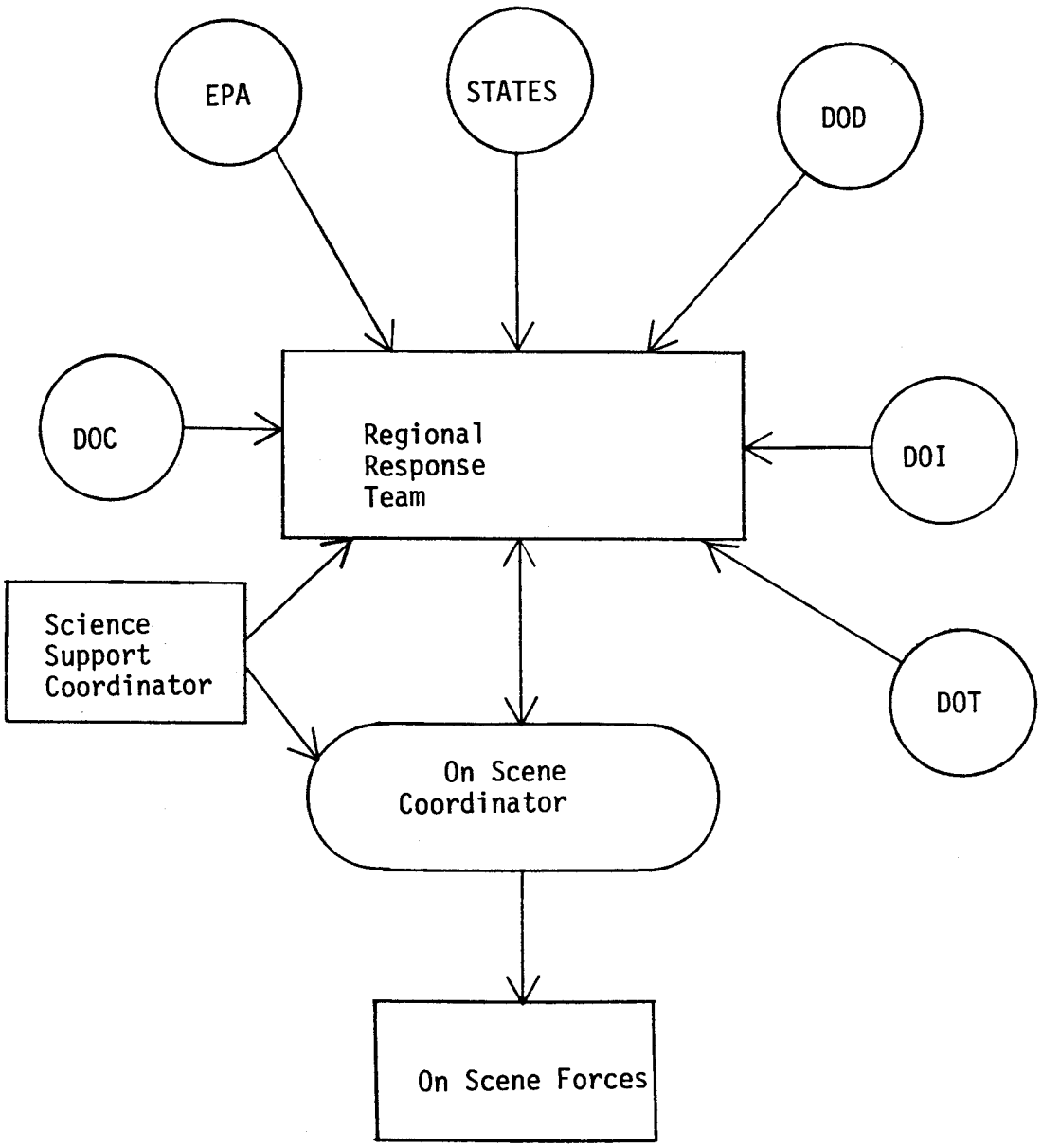
Authority of federal agencies and establishment of the Environmental Response Team.

F. Annexes:

Including detailed information on the use of chemicals for the removal of discharges.

Predesignated On Scene Coordinators, (OSC), serve as the single federal agent in charge during discharge events. The U.S. Coast Guard is responsible for providing OSCs in coastal and Great Lakes waters. EPA carries this responsibility for inland waters. The Regional Response Team,(RRT), is an interagency group which acts in advisory and oversite roles relative to the OSC. The RRT is the regional body responsible for contingency planning prior to spill events. It provides coordination of agency resources and advice during spills. Figure -1- further explains agency relationships.

Relationship of Federal Agencies under the National Plan.



Primary Agency Representation

EPA: Environmental Protection Agency
DOC: Department of Commerce
DOD: Department of Defense
DOI: Department of Interior
DOT: Department of Transportation
STATE: Local represenative

Figure 1

The plan has been expanded to include a Science Support Coordinator, (SSC). NOAA provides the SSC for coastal water spills, EPA for inland water spills. An SSC has operational requirements under spill and non-spill conditions.

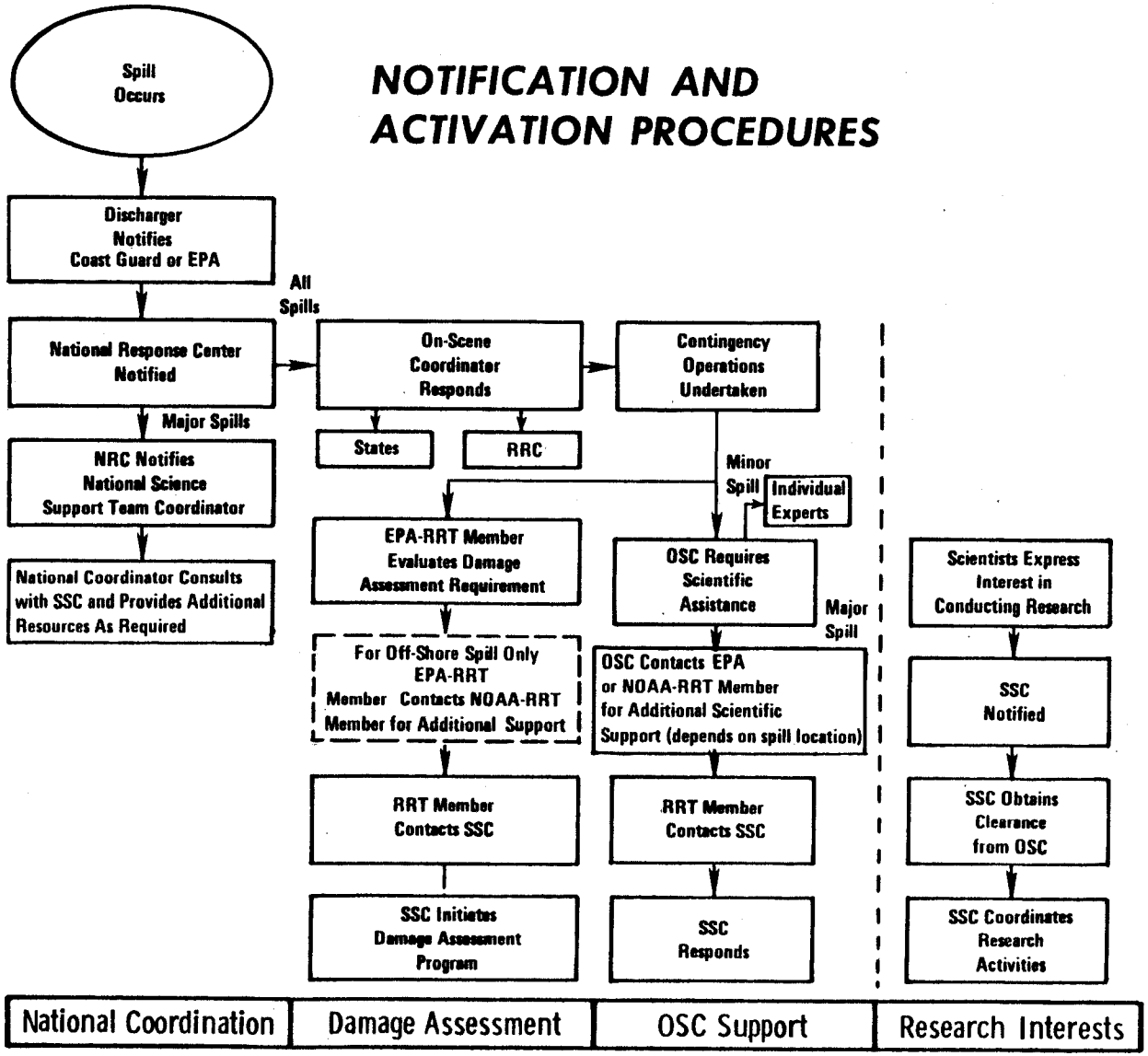
During spill response the SSC has three responsibilities:[3]

1. To provide the OSC with highly qualified scientific advice in mitigating environmental impact.
2. To assess the environmental damage and socioeconomic impact resulting from spills and
3. To maximize the research advantage offered by a spill situation, especially with respect to improving the capability for future response.

The activation of the SSC and the relationship of spill responsibilities are diagramed in figure -2-.[4]

Non-spill activities of the SSC are wide ranging.[5] Preparation for spill response requires planning and information attainment. OSC and RRT information needs for specific areas are identified. To the extent possible, the SSC provides this information. A list of people with expertise in fields which are of assistance in fulfilling spill related goals is assembled. Critical habitat areas are identified and mapped, this allows location and protection during spills. Prespill damage assessment plans must be developed. Equipment and supplies are obtained and kept in a response ready mode.

Science Support Coordination for coastal waters is provided through the NOAA Oil and Hazardous Materials,(OHM), Project. Headquartered in Boulder, Colorado the OHM program has five regional offices. The southeast OHM office was established in February of 1978. As an intern in this office,my responsi-



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19 May 1978

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(5)

Figure 2

bilities encompassed all phases of spill and non-spill activities.

On 13 June 1978 when my internship began E. Glade Woods was the sole staff member of the southeast OHM office. In addition to myself, another person joined the staff in July 1978. Her responsibilities were distinct from my own, but there were many occasions to work together closely. Joining the staff, I was thrust into a challenging position in a rapidly developing project office. The management philosophy of the office allowed me to gain diverse experience in a highly responsible position. While with Mr. Woods I learned each aspect of the project in a working, as opposed to educational, environment. As a result I constantly matured in my position as the program evolved.

My Marine Resource Management training provided the diverse educational background which was necessary to fulfill my responsibilities as assistant to Mr. Woods. The philosophy of balancing divergent interests to determine the most equitable problem solution which the program instilled allowed me to cope with the most tense situations encountered. Of the courses taken, those dealing with physical ocean processes proved the most useful in spill situations. The Tillamook Bay problems class provided invaluable training in the art of dealing with people of divergent background in addition to developing my leadership qualities. My public speaking ability was enhanced in both the transportation seminar and extension methods classes. As a result of my other course work, communication was possible with the chemists, geologists, oceanographers and economists with whom I had to deal.

In the final analysis, it was communication with MRM students and faculty which provided my most valuable training. In listening to a diversity of viewpoints and the accompanying rationale I best learned how to deal with all the people and situations which confronted me during my internship.

Beginning with three oil spill reports, examples of my work with NOAA follow. Each spill is representative of a SSC responsibility during spill events. Three examples of non-spill activities are also included. The first is the format in which each spill report is written. This format was developed to ensure accurate reporting of spill details for documentation purposes. Two other examples follow the spill reports.

Serving as the NOAA SSC at the Port Sulton oil spill involved three activities. Impacted sensitive environmental areas were identified and mapped using land, water and air surveillance. Working closely with the EPA representative on scene recommendations for clean-up were made to the OSC. Rationale for clean-up recommendations was based on observations, experience and information available in the literature. The threat to endangered wildlife in the area required that my activities and observations be coordinated with the federal and state wildlife representatives on scene.

When Cdr. Bing requested thatNOAA provide a SSC at Hackberry, Louisiana, I was the only staff member in the office. It was necessary for me to perform the confirmation and notification procedures and make logistical arrangements which would allow my response. This provided me experience in all the procedures involved in initiating a spill response.

My main responsibility at the spill scene was to work with EPA in developing a damage assessment plan. Very close coordination with EPA was necessary to focus and integrate the ideas of scientific team members. The plan in appendix 5 of the report is the result of this effort.

The work done at Savannah, Georgia, is an example of how simple experiments can help improve response capibility. Observations made at the photographic stations allowed in situ qualatative monitoring of several marsh areas. Little such information is available on the effects of clean-up operations. Future

clean-up technique recommendations can be made in similar areas with the guidance of these observations.

To obtain and access information on the hundreds of persons with oil related experience in a uniform manner, I developed the questionnair which follows. Over a period of four months the questionnair was drafted, reviewed and sample tested to assure effectiveness. The format allows easy, quick completion, while providing the information necessary for program files. Information is obtained in three areas, the person's field of knowledge, equipment available, and the ability of people and equipment to respond to a spill. Upon completion and return, questionnair information can be categorized and stored by a secretary without assistance.

In meeting with the Miami Region RRT, an information need was established concerning oil spill trajectory models. Using a model to predict the probable movement of an oil slick action can be taken to protect sensitive areas. The local Coast Guard was interested in the application and availability of models. I prepared a summary which wxplained model types and provided examples for reference.

REPORT NO.: SE-FL-78-10-01

TITLE: Hillsborough Bay, Port Sutton Oil Spill

DATES: 5 October - 9 October

TYPE OF MATERIAL SPILLED: Mixture of Bunker C and diesal

QUANTITY SPILLED: 40,000 - 50,000 gallons

A. NOTIFICATION ACTIVITIES:

Activation: USCG 7th District, Cdr. Bill Wilkins

Conformation: Capt. of Port, Cdr. Murray

Contacts:	Waynon Johnson	FWLS
	Don Eckberg	NMFS
	John Robinson	NOAA/ERL
	Gene Snider	NOAA/R&D

B. SITUATION DESCRIPTION:

Time/Date of Spill:

The time of the spill is unknown. The spill was discovered on the morning of 5 october.

Events/Cause:

Cause of the spill is as yet unknown.

Type of Material/Quantity:

The spilled material was a mixture of 20% diesal fuel and 80% Bunker C. This mixture is commonly burned as fuel in low speed steam engines of merchant vessels.

Immediate Action Taken to Contain Spill:

The spill was first discovered at Port Sutton on Hillsborough Bay. The water way of the port was boomed to contain oil as were pockets of oil traped along piers just south of 22nd St. Causeway.

Weather Conditions at the Time of Spill:

Precipitation: None

Wind: N-NE 5kn

Temperature: 80°F

Water Conditions at the Time of Spill:

Currents: Tidal currents in the Port Sutton area are 1-2kn.

Waves: Less than 1 foot.

Tides: The spill was reasoned to occur near high tide. Tidal range in the area is approximately 2.5 feet.

C. DESCRIPTION OF SPILL ENVIRONMENT:

General Description:

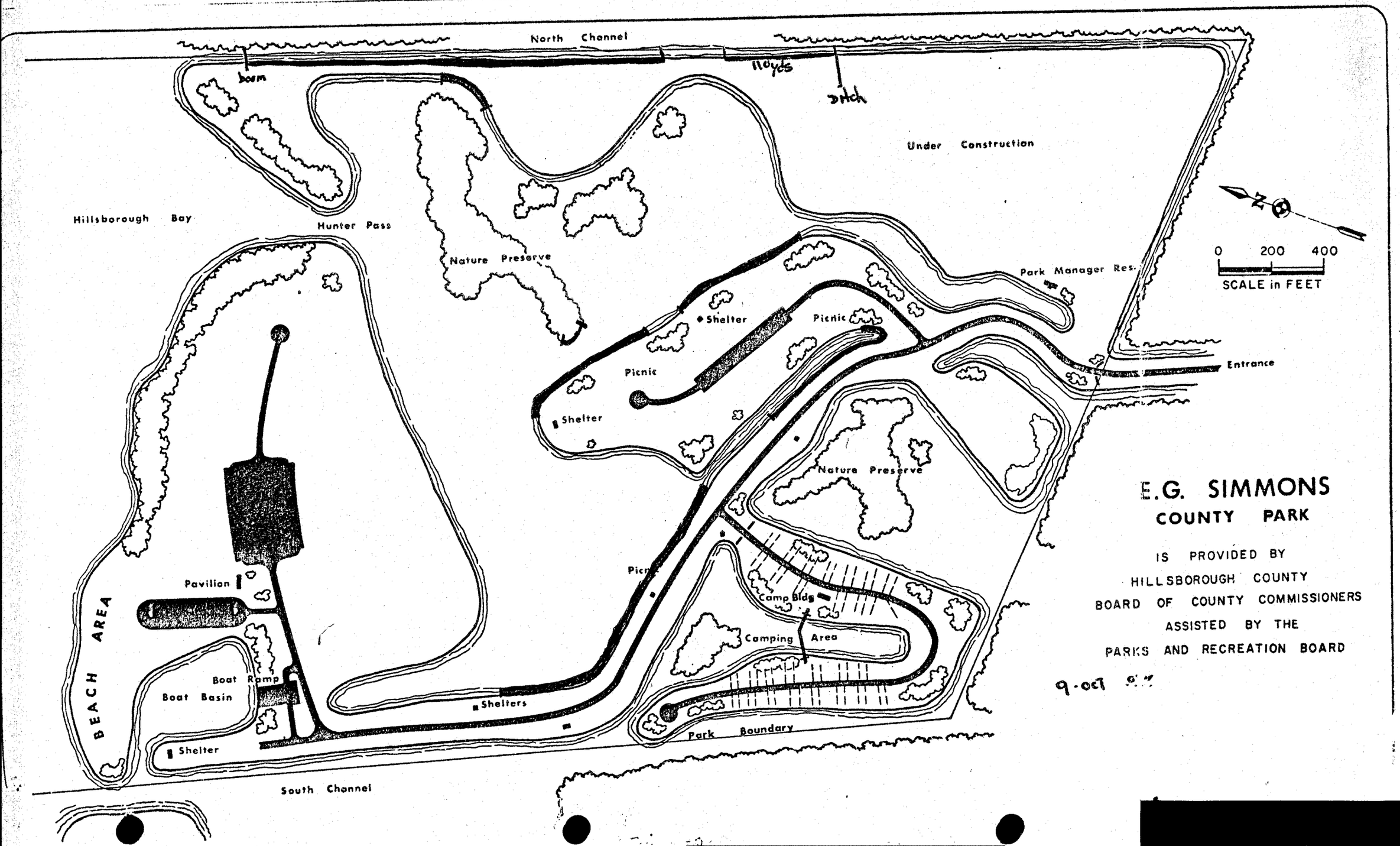
Tampa Bay is an estuarine system formerly bordered by mangroves and marsh grasses. Tampa was once a shallow bay. Presently there is an extensive dredging project underway to deepen the Bay. The northern bay is a developed port where the shoreline has been severly altered. Hooker Point has received a large amount of dredge spoils. The Inter Bay Peninsula is largly residential development. MacDill Field, an Air Force Base, occupies the southern portion of the peninsula. Rip-rap and concrete seawalls have been used to "stabilize" the eastern shore of the peninsula. The southeastern shore of Hillsborough Bay has many natural mangrove areas.

Specific Description:

Habitat: Two marsh habitats were affected by the spill. A small mangrove and grass marsh approximately 150 yards across on Hooker Point and another on Inter Bay Peninsula 1/4 mile long. A more extensive area of red, black and button wood mangroves on the eastern shore of Hillsborough Bay were affected. Oyster reefs are numerous in this area.

Organisms: Egrets and herons along with other shore birds such as sand pipers use areas of the bay affected by the oil. In addition, diving birds such as commorants and the endangered and protected Brown Pelican. Manatee an endangered and protected sea mammal use areas effected by the oil.

Season: Fall season. Migratory waterfowl were not in the region. It is not nesting time for the bird population. Large numbers of mullet were present in the bay.


North Channel
boom
110yds
ditch
Under Construction
Hillsborough Bay
Hunter Pass
Nature Preserve
Park Manager Res.
N
0 200 400
SCALE in FEET
Shelter
Picnic
Picnic
Shelter
Entrance
Nature Preserve
Pavilion
BEACH AREA
Camp Bldg
Camping Area
Boat Ramp
Boat Basin
Shelters
Park Boundary
Shelter
South Channel
E.G. SIMMONS
COUNTY PARK
IS PROVIDED BY
HILLSBOROUGH COUNTY
BOARD OF COUNTY COMMISSIONERS
ASSISTED BY THE
PARKS AND RECREATION BOARD
9-oct

D. ACTIVITIES/OBSERVATIONS:

Evening 5 October:

The immediate environmental concern expressed by the USCG to me involved the siting of oiled birds in the spill area. I was unable to observe any oiled birds before dark that evening. A siting of Brown Pelicans in the oiled area prompted me to initiate notification of the USF&WS representative to the RRT.

6 October:

A reconisance of affected land areas with Lt. Garlow and Lt. Simson revealed only one severly contaminated marsh area on Hookers Point. Containment boom was deployed in this area to prevent oil movement off the marsh and back into open water.

An extensive helecopter overflight in the afternoon showed oil comming ashore from Catfish Point to Ballest Point on the Interbay peninsula. In addition, several long narrow patches of heavy oil oriented N.E. to S.W. were present near the peninsula shore. With the wind prevailing from the N.E. these would come ashore.

Observation by boat in this area by Charles LeBuff, USF&WS, did not reveal any oil contaminated birds. Large numbers of menhaden were observed amongst the oil in the shallow portion of the bay where the oil was located.

A briefing was held that evening which the USCG, clean-up contractor, Florida Marine Patrol, USEPA, USF&WS, and NOAA attended. Plans were made to move operations headquarters to the MacDill Air Force Base. The majority of the oil appeared as if it would come ashore in this area. Lt. Simmons emphasized the need to use protective boom to prevent as much as possible the oil from comming ashore.

On the night of 6 October, a cold front passed through the Tampa Bay area. For part of the night winds shifted to the Northwest and then returned to N-N.E.

7 October:

The EPA representative and myself made a survey of environmentally sensitive areas on Hooker Point and Interbay Peninsula. Several oil covered birds were observed. In view of the fact that the majority of oil in the Hooker Point marsh had been removed by tidal action, no clean-up of this marsh was recommended. Heavily contaminated sand beach in this area was recommended to be cleaned. It was recommended that marsh and mangroves on the peninsula be cleaned using low pressure water flushing. Emphasis was placed on minimizing the impact of clean-up workers in the marsh areas. These recommendations were presented to Cdr. Whaley, OSC, on the afternoon of the 7th.

Personnel of the E.G. Simmons Park of Hillsborough County discovered oil on park waters. This may have been the result of the 6 October wind shift. The Coast Guard was notified of this.

8 October:

The EPA representative on scene surveyed the oil damage to the water ways, mangroves and beach areas of the park. He contacted myself and John Darovec of the Florida Dept. of Natural Resources.

9 October:

The EPA, State of Florida representatives and myself inspected by boat the adjacent areas North and South of the park. Only small amounts of oil had come ashore south of E. G. Simmons park. To the north mangroves had been effected by the oil. This area was inacessable by boat. Apollo Beach to the north of the park was contaminated by oil. The Big Ben generating station of the Tampa Electric Company had oil pockets trapped in the area of its water intake and discharge pipes.

Figure 2 is a map of the areas EPA, NOAA and the State agreed should be cleaned by low pressure water flushing. These are areas where oil pockets were trapped in the plant root system. It was feared that continual coating of Red Mangrove pnematophores would cause suffication of the plants. Emphasis was again given to reducing the impact of clean-up operations on the organisms present. A copy of fugure 2 was given to Lt. Simson of the Gulf Strike Team and Warren Baxter, the Park manager on the afternoon of 9 October.

Reference Charts:

Figures 1 and 2, C&GS navigation map #1257.

I. PARTICIPANTS LIST:

Cdr. Whaley	COP, USCG Tampa, FL
Lt. Garlow	MSO, USCG Tampa, FL
Lt. G. Simson	GST, USCG NSTL Station, MS
Waynon Johnson	USF&WS, Atlanta, GA
Charles LeBuff	USF&WS, Florida
John E. Minick	USF&WS, St. Petersburg, FL
Bob Kennedy	Florida Marine Patrol
Alan Bartlaht	USEPA, Atlanta, GA
John E. Darovec, Jr.	Dept. Natural Resources, FL
Warren Baxter	E.G. Simmons County Park
L.G. Burnett	Hillsborough County Parks and Recreation

SSC REPRESENTATIVE: Robert Pavia


TAMPA
Tampa Bay
Old Tampa Bay
Hillsborough Bay
Tampa Bay
Mac Dill Field
McKay Bay
Temple Terrace
UNIVERSITY OF SOUTH FLORIDA
BUSCH GARDENS
YBOR CITY
CITRUS PARK
TAMPA INTERNATIONAL AIRPORT
HILLSBOROUGH
COURTNEY CAMPBELL C'SWAY
TO CLEARWATER
TO OLDSMAR
W. HOWARD FRANKLAND BRIDGE
TO ST. PETERSBURG
GANDY BRIDGE
GIBSONTON
RIVERVIEW
SYMMES
ADAMSVILLE
Ruskin
Map of
Bahia Beach

Figure -1-

REPORT NO.: SE-LA-78-09-01

TITLE: Hackberry Strategic Oil Reserve Fire and Spill

DATES: 25 September - 1 October, 1978

TYPE MATERIAL SPILLED: crude oil

QUANTITY: 30,000 - 35,000 bbls.

A. NOTIFICATION

ACTIVATION: Cdr. Bing, 8th Coast Guard District, New Orleans, LA

CONFIRMATION: U.S. Coast Guard, Lt. Cdr. Phauf, Port Aurther, TX

CONTACTS:

John Robinson	NOAA/MESA	Boulder, CO
Don Eckberg	NMFS	St. Petersburg, FL
Waynon Johnson	USF&WS	Atlanta, GA
Will Davis	USEPA	Bears Bluff, SC

B. SITUATION DESCRIPTION:

TIME/DATE: Approximately 1700 hr. 21 September, 1978

EVENTS/CAUSE: Well blow-out in cavern 6 of the Strategic Petroleum Reserve, West Hackberry, LA. The blow-out resulted in a fire which lasted 5 days. The blow-out breached the dike seperating a brine containment area from Black Lake. This allowed unburned crude flowing from the well head to enter the lake.

TYPE/QUANTITY: An estimated 35,000 bbls of crude flowed onto the lake surface through the dike breach. The crude was a mixture of Irian, Arabian, Venezualian, and Isthmus stocks.

IMMEDIATE ACTION: Within 2-3 hrs. containment boom was deployed in Black Lake surrounding the enlarging spill. Efforts were undertaken to contain the well fire and cap the well. The dike breach was repaired and the length of the dike was increased.

WEATHER CONDITIONS:

PERCIPITATION: There was no percipitation within 5 days after the spill.

WIND: Wind conditions were extremely favorable for containment of the oil. The day of the spill, winds were from the East. Friday the wind switched to North - Northeast and remained from that direction for the next week.

TEMPERATURE: Air temperature was in the 80°F range.

WATER CONDITIONS:

CURRENTS: Water circulation in the lake is predominatly wind driven.

WAVES: Due to the short fetch of the lake, no large waves can be generated.

TIDES: Tidal range is approximately 8" in the lake. High water conditions were present at the time of the spill.

C. DESCRIPTION OF THE SPILL ENVIRONMENT:

GEOMORPHOLOGY: Black Lake is a small lake with an irregular shoreline fringed by marsh areas. The shoreline is in a constant state of flux. Upland from the lake, there is little vertical relief. Ajacent to and connected with Black Lake is a much larger lake, Cakasieu.

INDUSTRIAL/RESIDENTIAL DEVELOPMENT: Petroleum has been produced in the Black Lake area since 1938. There have been 200 producing wells in the lake. Petroleum is transported by barge and several pipelines in the lake. To the south of the lake there is improved and unimproved pasture on which are grazed horses and cattle. Numerous dikes and levies have altered lake configuration, salinity and errosional and depoitional patterns.

SPECIFIC DESCRIPTION:

HABITAT: The lake is a brackish (10% salinity) shallow water estuary. Tidal fluxuation is small. The benthos is sparcelly populated soft sediment. To the immediate west of the well site is a low energy, eroding shore. This is brackish marsh with Spartina, Juncus, and Distichlis as to dominant grasses.

ORGANISMS: LAKE - Despite a long pollution history, the lake remains very productive. Shrimp and blue-crab are commercially harvested. Red fish, gar, flounder, mullet and catfish are present. Allegators were seen in the area. Water fowl are known to use the general area during winter months.

ORGANISMS: MARSH - A variety of wading birds were evident. Evidence of small mammals was present in the marsh, as was that of deer. Fiddler crabs wer observed on the marsh. In the high marsh and adjacent improved pasture, cattle and horses are grazed.

CHEMICAL/PHYSICAL: There have been innumerable oil pollution incidents on Black Lake. An example, a slick was discovered eminting from a pipeline, crossing the lake, on 28 September. Disruption of bottom sediments produces evidence of oil contamination. The lake opens to the Gulf via Calcasieu Lake. The salinity of the lake has increased due to waterway projects of the Corps of Engineers.

SEASONAL WEATHER: Summer/Fall interface - No significant especially suseptible esturine life stages were present in the lake. Waterfowl migration to the area was just beginning.

D. ACTIVITIES/OBSERVATIONS:

DURING RESPONSE:

25 September:

19:30 hr reported to Department of Energy OSC Smoky Fields, then to USCG OSC Lt. Cdr. Phauf. Toured the well fire, oil containment, and clean-up areas with the USCG for familiarization with the site.

26 September:

EPA, State and Federal Fish and Wildlife people and myself met outside the Coast Guard trailer and discussed the spill situation as it conserned the environment. We agreed to an afternoon meeting for the purpose of developing a damage assessment program.

Met Dr. Lacester's group from the Center for BioOrganic studies, University of New Orleans. They were given a tour of the spill site.

Attended the morning DOE, USCG briefing session. The topic of earthen dike construction was discussed. See Appendix I. The Corps of Engineers representative to the RRT had developed for DOE a plan for construction of an earthen dike from dredged materials as a mechanism for containment of oil on the water in event of a weather change. Positive and negative aspects of the idea were discussed prior to its presentation to the full RRT in the evening.

AFTERNOON 26 September:

USEPA, NOAA, USF&WS, State Wildlife and Fisheries, Environmental contractors to DOE and University of New Orleans people met to lay down a basic frame work for damage assessment. This discussion continued in small groups through the afternoon. It was decided that in accordance with the National Plan, EPA would take the lead for damage assessment activities with NOAA providing whatever support necessary.

EVENING 26 September:

The RRT was convined by Cdr. Bing, USCG 8th District, at the spill scene. The spill and clean-up activities to date were summerized. The topic of the dike was discussed. DOE announced that they would lead and pay for damage assessment activities in cooperation with other federal and state agencies.

NIGHT 26 September:

Bob Forest, Tony DiRosario of EPA, myself and the UNO group discussed a sampling program that would delineate the extent of DOE oil contamination on land and in the water.

Morning 27 September

Dr. John Cece of Dept. of Energy called a meeting of the Damage Assessment team whose members are listed in Annex 2. This group produced a plan for assessment of Dept. of Energy oil impact on the surrounding environment (Annex 3). This plan was presented to the RRT for comment at noon.

Afternoon 27 September

The Assessment team reconvened to discuss the mechanisms available for implementation of the assessment plan.

It was decided by Dr. Cece, with concurrence of those present, that Dr. Lacaster's groups from UNO would supervise chemical sampling with assistance from University of Rhode Island people.

Bob Forest and myself were responsible for developing a detailed plan for biological assessment and overseeing its initiation by the Dames and Moore contracting team and the University of Rhode Island people. In addition, we served as an interface between the biology and chemistry teams. I was able to make a helicopter overflight of spill area.

28 September

After discussion with Dr. Cece as to the type of program desired, Bob Forest and Jeff Scott, USEPA and myself began development of the biological Assessment Plan.

In the afternoon, Mr. Scott and myself made a close aerial inspection of the land and water areas impacted by the oil spill and fire.

Evening:

With a clear picture of the impacted areas the biological plan was further developed.

Morning 29 September

In a morning meeting, organization of the assessment team was laid out (Appendix 4). The implementation of chain of custody proceedings was stressed.

Teams were then sent into the Field to implement the program.

Afternoon 29 September

With feedback from the field groups the biological plan was revised. Sample coordination with the chemical analysis group was insured.

The scope and limitations of the biological plan was carefully discussed among Bob Forest, Dr. Cece, Mason Wilson and myself.

Morning 30 September

The Biological Plan, Appendix 5, was presented to Dr. Cece.

The remainder of Saturday and Sunday morning was spent assuring that the plan was working properly and attending to details which would allow my departure.

The assessment team will be called together in the future by the team manager to review progress of the program.

SYSTEMS EVALUATION:

There was some initial miscommunication among EPA, Dept. of Energy and the Coast Guard as to the role that NOAA would plan in Damage Assessment. The confusion which resulted was resolved on the 26th.

PARTICIPANTS LIST:

Will be provided in the future.

SSC Representative: Robert Pavia

APPENDIX 1

Department of Energy
Strategic Petroleum Reserve Project Management Office
900 Commerce Road East
New Orleans, Louisiana 70123

September 26, 1978

Colonel Thomas Sands
U.S.A. District Engineer
U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60207
New Orleans, Louisiana 70160

Attention: Ron Ventola
Ext. 447-Call for Pickup

Subject: Permit for Emergency Dike to Contain Oil Spill

Gentlemen:

Due to the blowout of Well Number 6 at the Department of Energy's Strategic Petroleum Reserve Facility at West Hackberry, Louisiana, we have oil in Black Lake, along an approximate 1200' frontage adjacent to our well site. It is presently contained by booms and we have mobilized a large force to remove the oil from the lake.

We have, thus far, been favored with Northerly winds which assist the containment of oil. The latest weather prediction is that the wind will change to a Southerly direction within a few hours. Additional booms will be deployed.

We would like a permit to build a temporary containment dike in the lake adjacent to the shoreline to assist the containment of the oil after the wind shifts. Because oil cleanup operations will continue for several weeks into the foreseeable future, the proposed containment dike will provide a significantly more reliable method of oil containment then the presently deployed booms. An enclosed map of the area shows the proposed alignment of the dike.

We would use standard dragline methods to build the dike and will borrow from the lake bottom to a maximum depth of six feet. A cross section of the dike and the lake bottom borrow area are shown on the enclosure. If we do not utilize the proposed dike and additional booms, the oil spill may conceivably cause serious damage to the lake environment.

(cont.)

Federal Agencies on site who are assisting and coordinating with us in this matter include the U.S. Coast Guard, Environmental Protection Agency, the U.S. Fishery and Wildlife Service, and your own representative from the U.S. Army Corps of Engineers.

State Agencies represented on site include Representatives of the Department of Natural Resources, the Conservation Department, and the Louisiana State Wildlife and Fisheries.

We are coordinating this plan with:National Marine Fisheries Service; the Louisiana Stream Control Commission, and the Louisiana Office of Public Works.

We would appreciate your immediate response by telephone when the permit is granted so our personnel, equipment, and facilities which are currently mobilized, may start work at the earliest moment. Your consideration and assistance during this emergency and the services of your on-site representative are most appreciated.

We may be reached at the following number:

Area Code 318- 762-4211
" - 762-4706
" - 762-4811
" - 762-5721
" - 762-5141
" - 762-4888
" - 762-4800
" - 433-3573

If any of these lines are busy, please ask the Lake Charles Operator for emergency interruption. If I am not personally available, you may communicate with Mr. L. Frank "Smokie" Fields, Mr. James Primm, Mr. Bill Smollen, Mr. Tom Petty, Mr. Maurice Graber, Mr. Allen Fruge, and, or Mr. Bob Weller.

Your earliest response will be most appreciated.

Very truly yours,

Donald W. Mazur. Project Manager
Strategic Petroleum Reserve Office

DWM/RS/jal

cc: See Attached Listing

September 25, 1978

Colonel Thomas Sands,
U.S.A. District Engineer
U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60207
New Orleans, La. 70160

Attention: Charles Decker

Subject: Permit for Emergency Dike to Contain Oil Spill

Distribution as Follows:

Federal

Mr. Terry Leitzell,
National Marine Fisheries Service

Mr. John Walters,
U.S. Fisheries and Wildlife Service

Mr. Bob Forest,
Environmental Protection Agency

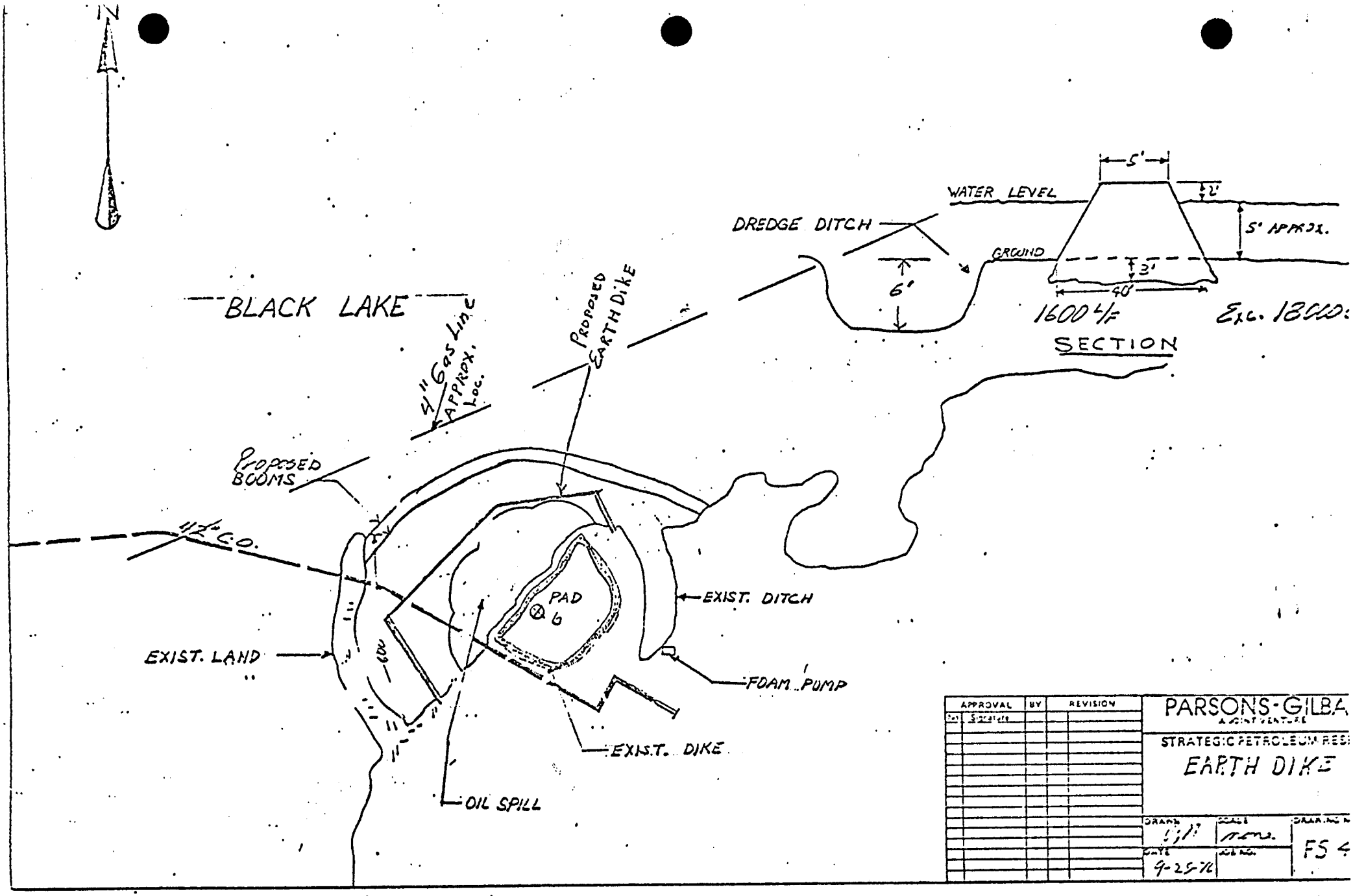
State

Mr. Guy Broussard,
Department of National Resources Commission

Mr. Larry Racca,
Louisiana Wildlife and Fisheries

Mr. Bob LaFleur,
Louisiana Stream Control Commission

Mr. Arthur Theis,
Office of Public Works.



APPROVAL		BY	REVISION
DATE	SIGNATURE		

PARSONS-GILBA
A JOINT VENTURE

STRATEGIC PETROLEUM RES

EARTH DIKE

DRAWN: [illegible]
SCALE: NONE
DRAWING NO: FS 4
DATE: 9-25-7[illegible]
JOB NO.

APPENDIX 2

Assessment Planning Team

NAME

John Cece
DOE

Jim Martin
RRT, U.S. CORPS OF ENGINEERS

Mark Boudreaux
DAMES AND MOORE
Site Contracter

Bob Forest
EPA

John R. Walther
U.S. FISH AND WILDLIFE SERVICE

Glenn A. Miller
PARSON GILBANE
Site Contracter

Tony Dirosario
USEPA Dallas, Texas

Robert E. Cox
Parsons-Gilbane
Site Contractor

Mary F. Kutac
DAMES AND MOORE

Robert Pavia
NOAA-MESA

Mason Wilson
University of Rhode Island

Charles White
LA. DEPT. OF WILDLIFE

Larry D. Racca
LA. STREAM CONTROL COMMISSION

APPENDIX 3

9/27/78

ENVIROMENTAL ASSESSMENT
WEST HACKBERRY, LA.

OBJECTIVES

A. WHERE IS THE DOE OIL

B. ASSESS DAMAGE

A. Water
B. Marsh
C. Inland

GENERAL:

1. Examine both affected and inaffected area
2. Document as possible, the environmental status before the incident.
3. Interview nearby residents to be DOE tasks.
4. Include on-site damage, injuries, deaths, as part of assessment.
5. Socio-Economic Impact

   A. Lost recreational benefits

   B. Lost commercial production

ASSESSMENT TEAM 9/27/78

1. WATER

Grid network; precise locations

Surface	Distribution of hydrocarbons
Water Column	(Primarily sediments)
Sediment	

Marine Organisms as possible near sampling stations

Affected and unaffected areas

"Tight" sampling near run off points

Hydrology model?--recommend hydrology made not be developed

Repeated sampling as F (time)

Impact of higher forms of life
(e.g. muskrats, birds, shrimp, crab, barnacles)

Wind movement of surface water

Downwind water fallout (see INLAND section)

Note: Unaffected area (mostly likely northwest area of Black Lake)

ASSESSMENT TEAM 9-27-78

2. MARSH

Affected marsh area is relatively small

1 mile x 200-300 years

Grid network; semi-precise locations

Surface
Water Column
Sediment

Marine organisms - - - - Plants

Determine affected and unaffected (area IR Photo)

Terrestrial organisms (Plants and Animals)

Terrestrial samples (2 MM, 2CM) Soil

Repeated sampling- F (Time)

If the marsh is burned:
(Sample before)
(Sample after)

Extent of presence of oil

Stake out piece of land and monitor as F (Time)

Usage by migratory waterfowl/birds? (appears very low)

3. INLAND (Plume)
(Affected vs unaffected areas)

Map extent of fallout
(oil extent)
(soot extent)

Grid sampling as F (Time)

Affect on terrestrial life
(Cows affected)
(Milk afffected)

Lake area (downwind)
(Same as for water)

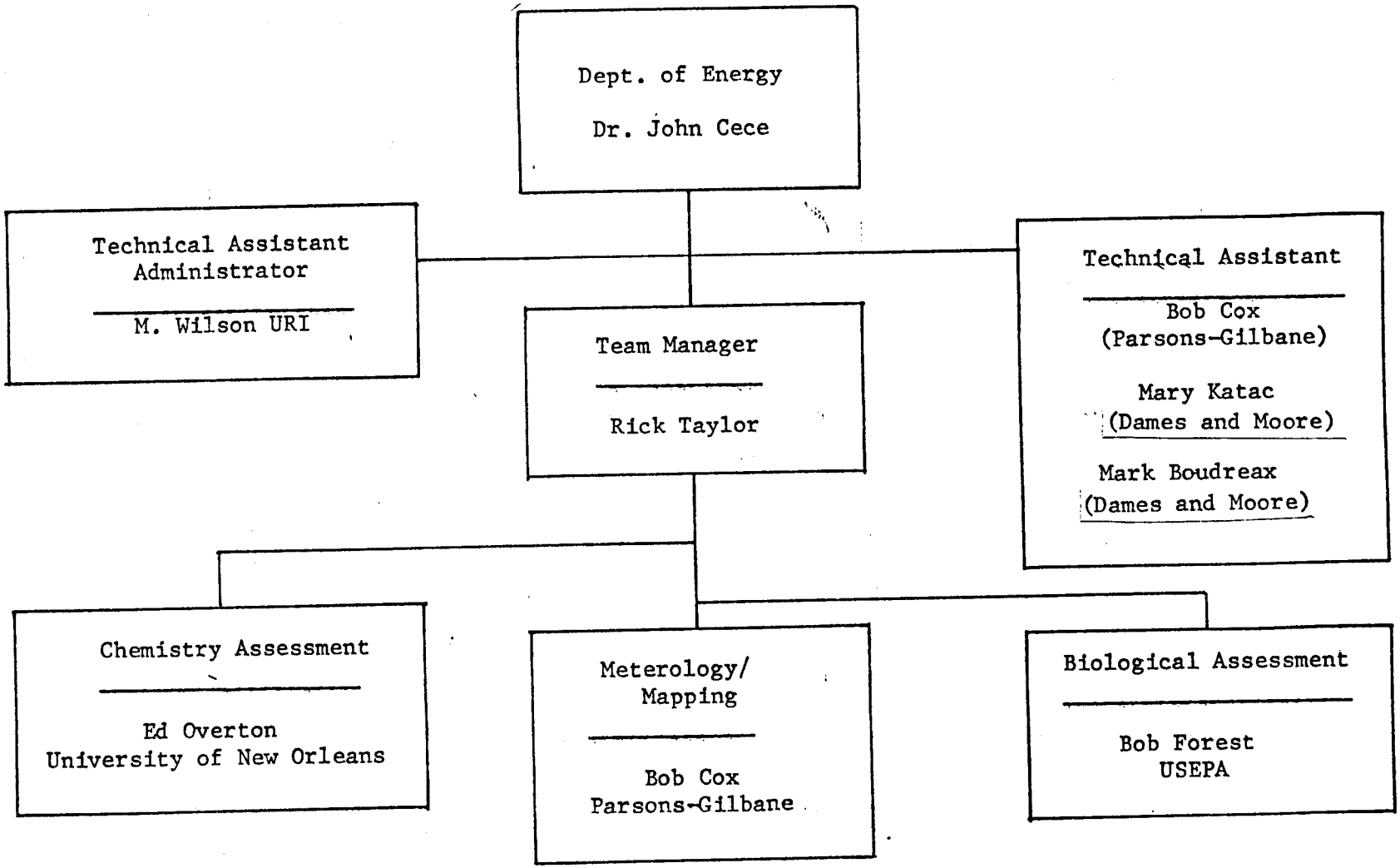
Terrestrial life-
(Plant life)
(Domestic animals)

Farms/vegetable downwind

Physical effect
(Soot on cars)
(Oil on cars)

APPENDIX 4

Environmental Assessment Team Organization



APPENDIX 5

ENVIRONMENTAL ASSESSMENT STUDY
DOE WEST HACKBERRY PROJECT, LOUISIANA
SEPT./OCT. 1978

BIOLOGICAL SURVEY WORK PLAN

I OBJECTIVES

A. To deliniate, in conjunction with chemical analysis, the extent of DOE oil contamination in three general habitats adjacent to the oil spill and fire plume.

B. To characterise each habitat as to the community types present.

C. To monitor over time how the habitats in areas affected by the oil spill and fire flume may change with reference to similar unaffected areas.

II WORK PLAN

A. Sampling will be conducted in three major habitats including:
   (1) Lake
      a) Pelagic
      b) Benthos (infaunal, epi faunal)
   (2) Marsh
      a) Plants
      b) Benthos (infaunal, epi faunal)

   (3) Terrestrial
      a) Plants
      b) Soil (infaunal, epi faunal)

B. Black Lake Sampling

   (1) Pelagic
      a) Sampling for PHC in tissues will be carried out in three areas, using gill nets:

	Site Samples
i) Control area upwind from spill	1
ii) Area offshore and adjacent to the spill	2
iii) Control area downwind from spill	1

      b) Photographs of gill net catches to illustrate size classes of fish.

   (2) Benthic

      a) Sampling will be conducted using a Mini-Ponar grab in three areas:

	Sample Sites	No. Grabs
i) Control area upwind	2	8
ii) Offshore, adjacent to spill	4	16
iii) Control area downwind from spill	2	8

b) At each sample site, four replicate samples will be taken
   i) Three samples for habitat quantification
   ii) One sample for PHC analysis

c) One seived sample will be saved for grain size distribution analysis.

C. Marsh Sampling

(1) Low Marsh - generally defined as that marsh zone contiguous with open lake areas and characterized by shallow water with either dense even cover of emergent vegetation (unbroken marsh) or scattered small hammocks of vegetation (broken marsh).

a) Use grid system, selecting areas in the broken marsh (offshore) and unbroken marsh areas for detailed analysis. Within each selected grid, samples will be selected randomly for benthic sampling of epi-and infaunal macroorganisms and surface plants. Samples will be collected in three major areas:

	Sample Sites	M 2/4
i) In unbroken and broken marsh upwind of spill	4	16
ii) In unbroken and broken marsh adjacent to spill	9	36
iii) In unbroken and broken marsh downwind of spill	4	16

b) A total of 72 1/4 square meter (10 em deep) samples will be collected.

c) In each grid sample 4 ¼ square meter (10 em deep) samples will be taken per grid:

   i) Three samples for quantification
   ii) One sample for tissue analysis (PHC)

d) Qualitative descriptions of each area sampled will be taken.

e) Water samples for BOD and COD determinations will be collected.

(2) High Marsh - generally defined as that marsh area existing between the low marsh and terrestrial zones and characterized by dense vegetation in shallow water or areas intermittently flooded during tidal cycles.

a) Samples will be collected by running transects through the marsh. Quarter square meter samples (4), 10 cm deep, will be obtained on both sides of a transect line, 40 meters long, at selected intervals:

	No. Sample Sites	Total ¼ M^2
i) Upwind	3	72
ii) Adjacent	6	24
iii) Downwind	3	12

D. Terrestrial Sampling

(1) Sampling will be conducted using transects continuing the same lines begun in the high marsh. Three areas will be sampled:

	Sample Sites	No.of ¼ M^2 (10 cm deep)
a) Upwind control	4	16
b) Adjacent inland areas to the spill, in line w/smoke plume	4	16
c) Downwind control	4	16

(2) Sampling will also be conducted in wooded uplands, pastures and prairie areas. Analysis will include quarter square meter samples (4), 10 cm deep, on each side of the transect at selected intervals.

(3) At sites where collection was done for chemical analysis, a description of vegetation types and a characterization of land use will be performed. In addition, at selected locations at these sites, small mammal traps will be set to obtain tissue samples for chemical analysis.

E. Physical/Chemical measurements

(1) Measurements will primarily be obtained by resident project environmental personnel.

	Terrestrial Soil	Water Column	Lake Sediment	Marsh Sediment	Air
a) Hydrography		*			
b) Temperature	*	*	*	*	*
c) Salinity	*	*			
d) pH	*	*	*	*	*
e) DO		*			
f) Redox			*	*	

FIELD ACTIVITIES REPORT

REPORT NO.: SE-GA-78-07-01B

TITLE: Supplimental Report on Certain-Teed Asphalt Spill - Savannah, Georgia

DATES: 31 July - 3 August, 1978

TYPE OF MATERIAL SPILLED: Liquid Asphalt

QUANTITY SPILLED: 2500 - 5000 gallons entered waterway. 28,000 gallons spilled at the plant site.

A. NOTIFICATION ACTIVITIES:

ACTIVATION (BY WHOM): Lt. Janice Page, U.S. Coast Guard, Miami, Florida

CONFIRMATION: U.S. Coast Guard

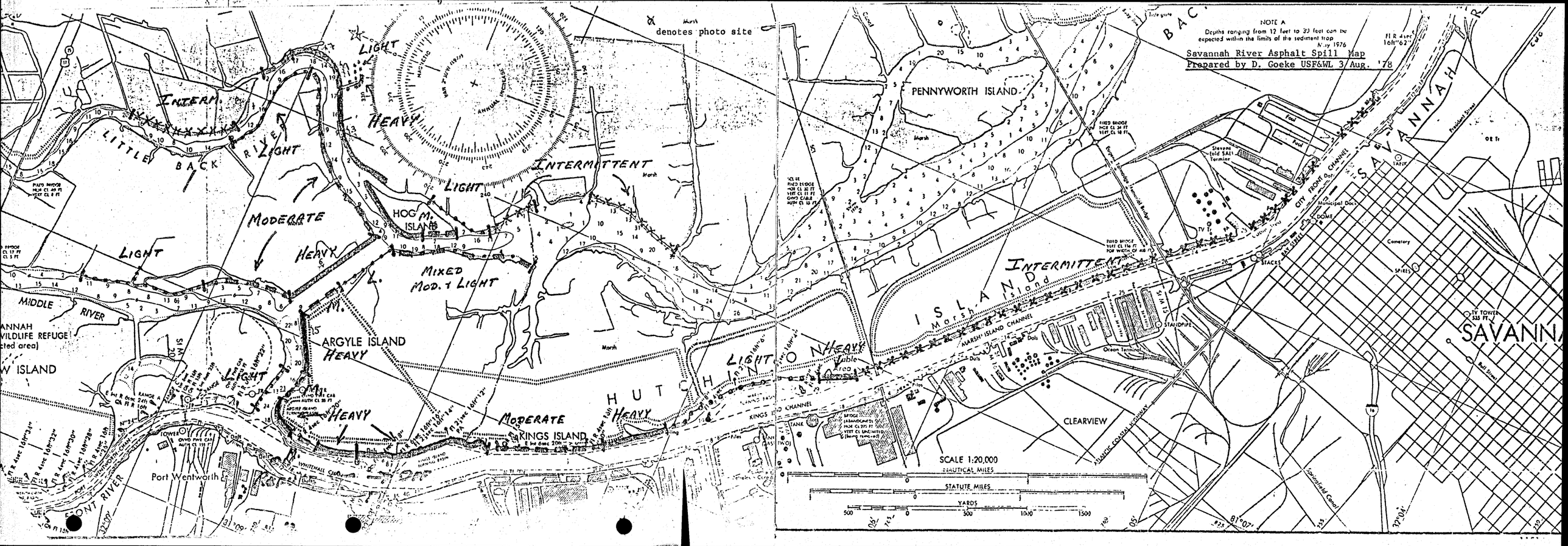
CONTACTS: Dr. Eckberg, St. Petersburg, FL, made the notifying call to our office. Captain Madson, chairman of District IV RRT requested that the NOAA SSC join the F&WL, USCG, and the States in the Clean-up and assessment.

B. SITUATION DESCRIPTION:

TIME/DATE OF SPILL: 1978

EVENTS/CAUSE: On Tuesday 24 July, 1978, Certain-Teed Products Company released liquid asphalt into the Savannah river as a result of a failure during product handling. Bill Commins acting USCG OSC stated that spill amount estimates range from 2,500 gallons to 5,00 gallons. The lower figure is believed more accurate.

Although Certain-Teed is approximately 3 miles down stream from the refuge an incoming tide combined with a northeast wind carried asphalt up river and into the refuge. A large amount of the asphalt, see map, was deposited on refuge marsh grasses. Dave Goeke estimated that 8.5 miles of shoreline were effected within the refuge. The pattern of asphalt deposition gives an indication of water movement at the time of the spill


denotes photo site
NOTE A
Depths ranging from 12 feet to 30 feet can be expected within the limits of the sediment trap
May 1976
Savannah River Asphalt Spill Map
Prepared by D. Goeke USF&WL 3 Aug. '78
LITTLE BACK RIVER
INTERMITTENT
LIGHT
HEAVY
MODERATE
MIXED
MOD. to LIGHT
HOG ISLAND
ARGYLE ISLAND
MIDDLE RIVER
HUTCHINSON ISLAND
KINGS ISLAND
Port Wentworth
FRONT RIVER
PENNYWORTH ISLAND
Marsh Island
MARSH ISLAND CHANNEL
Ocean Terminal
CLEARVIEW
ATLANTIC COASTAL HIGHWAY
SAVANNAH RIVER
CITY FRONT CHANNEL
Municipal Dock
DOME
Cemetery
STACKS
SPIRES
IV TOWER 335 FT.
SAVANNA
Springfield Canal
SCALE 1:20,000
NAUTICAL MILES
STATUTE MILES
YARDS

Marsh grasses served as a filter removing asphalt from the water column on the rising tide. The physical nature of the asphalt restricted deposition on plants to those within 4' - 6' of the river banks.

ACTION TAKEN TO CONTAIN SPILL:

Initial clen-up operations were delayed when the company first contacted by Certain-Teed failed to respond to the site. John Nasworthy of Coastal Divers and Pollution Control responded to the scene after being contacted. His clean-up operation was able to remove approximately 250 gallons of asphalt from the river. An agreement was reached between USF&W Service and the USDCG as to the procedure for removal of asphalt covered vegetation in the refuge area. See appendix 1. The basic operation involved cutting of effected marsh grasses, baging them, and then removal by barge for land disposal. Cutting was accomplished using "weed eaters" equiped with metal blades. Grasses were cut as close to ground level as possible.

WEATHER CONDITIONS AT TIME OF SPILL:

PRECIPITATION: A rain shower occurred right after the spill.

WIND: from the northeast.

TEMPERATURE:

WATER CONDITIONS AT TIME OF SPILL:

CURRENTS: Strong tidal current

WAVES:

TIDE: Incomming at the time of spill. Higher than normal.

C. DESCRIPTION OF SPILL ENVIRONMENT:

GENERAL DESCRIPTION: The spill occurred in the fluvial environment of the Savannah River. This is a tidaly influenced river system with salt intrusion further than 20 miles up river. There is little vertical relief in land forms. The majority of land being as high as MLW or slightly higher.

The Savannah River is a highly industrialized port. The majority of development is on the southern bank of the river. Much of the northern bank is tidal wetland.

SPECIFIC: With in the refuge the major habitats consist of fresh water marsh grasses, with some areas of shruby vegetation, several cypress stands and some sandy beaches. A large part of the area is submerged during daily high tides.

A large variety of organisms exist in the refuge. These include snakes and allegators, wild bores, a large variety of birds, and various small mammals. Fiddler crabs very abundant along the marsh banks. There is a Blue Crab fishery in the area. Porpose and manatee have been observed in the river.

Large numbers of waterfoul are normally in the refuge during fall and winter months. Because the spill occurred during the summer, there were fewer birds in the area that might be effected by the asphalt.

D. ACTIVITIES/OBSERVATIONS:

The activities herein reported were initiated one week after the initial spill incident. The purpose of these activities was to observe the effects of the spill in the Savannah Refuge.

Monday, July 31, 1978

Flew to Charleston, SC. I was met at the airport by Sharon Maier, Southeast EPA representative for the Oil and Hazardous Materials project. While driving to Savannah, I briefed Ms. Maier as to the events which had occurred at the spill site during the previous week. We discussed possible actions by NOAA/EPA at the spill site.

Tuesday, August 1, 1978

morning: Ms. Maier and I met with Pat Young, refuge field response coordinator for oil spills, and Dave Goeke, refuge manager. Both are USF&W Service personnel. They provided background on the spill.

afternoon: Terry English, USF&W Service, guided Ms. Maier and Myself by boat to view the asphalt impacted

areas of shoreline. In addition to the 8.5 miles of shoreline effected within the refuge, an additional 8 miles outside refuge boundaries were effected. Mr. Goeke estimated that 95% of the effected area in the refuge was marsh grass, the majority of which was fresh water. Some Spartina was present near the refuge boundary on Front River. This grass was first observed in the area after construction of tide gates on the river system. Other habitats effected by the asphalt include sandy beaches, shrub and brush areas and some small cypress stands.

Other than plants, the most heavily impacted organisms appered to be fiddler crabs. Fiddlers were present in large numbers throughout the marsh areas. Observation of these crabs showed some with little asphalt on them and others with complete coatings. All fiddler crabs observed on this day were active, apparently suffering no adverse effects from the asphalt. One great blue herron was observed with oil on its neck plumage. USF&W personnel stated that no heavily oiled birds have been observed since the spill.

Wednesday, August 2, 1978

Mr. Goeke, Ms. Young, Mr. Commins, Ms. Maier and I met in the USF&W offices to discuss post spill activities. All agreed that clean-up operations were proceeding well. Mechanical or chemical removal of asphalt from cypress areas was not considered desirable. The probable effectiveness of such actions had been questioned. It was agreed that areas of brush and low shrubs be cleared of coated dead wood and asphalt covered brnches pruned back. Mr. Goeke expressed his concern as to the preparedness of refuge personnel to deal with similar situations. Ways to increase preparedness were discussed. The role of the SSC was explained to those present.

E. REFERENCE MATERIALS:

Slides and slide description taken during time at spill site.

F. DAMAGE ASSESSMENT

As a cooperative USF&WS, EPA, NOAA project, nine photographic sites in the refuge were established. The sites will serve as a basis to monitor the recovery of marsh grasses from the asphalt coating. USF&WS personnel have agreed to monitor the sites on a regular basis. NOAA and EPA personnel will return to observe the area and consult with USF&WS in the second week of September. Photo site locations are shown on the map. Site descriptions are given below:

Site 1:

Description: heavily coated fresh water marsh grasses on eastern eroding edge of Back River. Plant stems are coated compleatly from the sediment surface to the high tide line. Coated but active fiddler crabs were observed in the area.

Purpose: to observe the effects of asphalt coating on fresh water marsh grass. This area was left undisturbed after being coated with asphalt.

Site 2:

Description: Sandy beach on east side of Back River. This is one of the few beach areas in the refuge effected by asphalt. There was a heavy concentration of the asphalt on the beach.

Purpose: To observe the weathering of the asphalt at the high tide line of the beach.

Site 3:

Description: Moderately asphalted fresh water marsh area just north of site 2. The vegetation had been cut in this area within 7 days of the spill. Because this site was established by USF&WS just after the spill, there is a continuous series of observations at this site.

Purpose: To monitor the regrowth of grass in a moderately asphalted area. To observe the weathering of asphalt remaining on plant stems between the cut edge of the stem and the sediment.

Site 4:

Description: East side of Front River, with gradually sloping sediment surface. Heavily coated Spartina grass. This area was undisturbed after the spill.

Purpose: To observe the effect of asphalt on Spartina.

Site 5:

Description: Cypress trees on the southeast side of Middle River near New Cut. Both living trees and the knees of the dead trees were present. One of the few cypress stands in the spill effected area.

Purpose: To observe asphalt weathering on cypress trees. Asphalt was present at the base of the trees and at the sediment level.

Site 6:

Description: Original USF&WS photo site in a heavily asphalted fresh water marsh area.

Site 7:

Description: Beach area on eastern eroding side of Back River. The landward side of this beach was boardered by shrub and brush vegitation.

Purpose: To document the before and after clean-up appearance of this moderately asphalted area.

Site 8:

Description: Fresh water marsh area just north of sites 1, 7, and 9.

Purpose: To serve as a reference observation area of unaffected marsh area.

Site 9:

Description: Same physical conditions as site 1. In this area adjacent to site 1, the vegetation was removed approximately 7-9 days after the spill.

Purpose: To compare the recovery of un-cut fresh water marsh grass to that of cut grass in a heavily asphalted area.

G. SYSTEMS EVALUATION:

The spill made apparent the need for improved communication between USF&WS and USCG in event of a similar situation. Both parties agreed to improve the communication link.

Water flow patterns made apparent by asphalt deposition clearly showed that if another oil spill occured on the Savannah River, it would most likely effect the refuge. This is of concern to Mr. Goeke, who suggested that booms be stored at the confulence of Middle and Front Rivers. Positioning of these booms would reduce the impact of a similar spill on the refuge. In order to be feasible, three conditions must be met:

1) The boom is effective withsin the range of water currents present.

2) Vandalism to the booms can be prevented.

3) An effective mechanism for deployment and maintenance of booms during emergency conditions can be arranged.

H. PARTICIPANTS' LIST:

Pat Young - Refuge field response coordinator for oil spills-USF&WS.

David Goeke - Refuge Manager-USF&WS

Terry English - Enforcement Officer-USF&WS

Bill Commins - Acting OSC-USCG

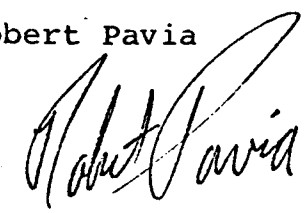
Sharon Maier - EPA Representative, Bears Bluff, SC

John Nasworthy - Coastal Divers and Pollution Control

I. DISTRIBUTION:

Sharon Maier - EPA, Bears Bluff, SC
David Goeke - USF&WS, Savannah National Wildlife Refuge
Bill Commins - USCG, Savannah, GA

REPORT WRITER: Robert Pavia



Appendix 1

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Savannah National Wildlife Refuge Complex
P.O. Box 8487, Savannah, Georgia 31412

July 28, 1978

Captain of the Port
U.S. Coast Guard
Marine Safety Office
Savannah, Georgia 31412

Dear Sir:

The U.S. Fish & Wildlife Service is concerned that clean-up of portions of the Savannah National Wildlife Refuge affected by the spill of liquid asphalt from the Certain-Teed Corporation be given immediate consideration. Efforts to date are to be commended and this letter is to formally confirm those clean-up measures discussed with Bill Cummins of your office. These measures include the following:

1. Cut and remove from the refuge all herbaceous plant materials contaminated with asphalt. Highest priority is to be given those areas of heaviest contamination.

2. All living woody plants are to be bypassed until a satisfactory method of removing or neutralizing the asphalt on these plants is approved. Contaminated dead branches and pieces of drift-wood should be removed, but by no means should live roots, cypress knees, etc. or standing dead trees be removed.

3. All cultural remains such as old pilings, bulkheads, bricks or other remains of human habitation should be treated in the same manner as woody plant materials. In no case is any of this material to be removed.

4. All forms of wildlife and all uncontaminated plants on the refuge are protected. No animals of any kind are to be killed or molested during the clean-up operations. However, we would appreciate clean-up crews keeping track of the number and kinds of animals found dead or observed having been contaminated by the asphalt. Refuge personnel should be notified if dead animals are found so these specimens can be preserved.

A detailed map of the refuge areas that need cleaning up will be provided within a short time.

Sincerely,

David E. Goeke

David E. Goeke
Refuge Manager

cc: Area Manager, Jacksonville, Florida
Regional Oil Response Co-ordinator, Atlanta, Georgia
Glade Woods, NOAA

FIELD ACTIVITIES REPORT

REPORT NO: SE-GA-78-07-01C

TITLE: Second Supplimental Report on Certain-Teed Asphalt Spill - Savannah, GA

DATE: 13 September, 1978

DAMAGE ASSESSMENT: Each of the photographic sites, see report #SE-GA-78-07-01B, established in the spill area were revisited to observe marsh recovery.

Regrowth of fresh-water marsh grass at sites 3, 5, & 9 was very good. Many plants had grown 75 cm since being cut. Not all cut plants did regenerate. Some of the cut plants were observed to be flowering.

To either side of site 4, Spartina grass, which had been cut, was recovering poorly.

At sites 1, 4, & 5 where asphalt was present on uncut fresh-water grasses, Spartina, and Cypress knees, little weathering of the product was observed. Although a layer of silt had been deposited from the river, the asphalt beneith was tacky to the touch.

At site 2, the majority of asphalt on the beach had been removed during clean-up operations. Present on the beach were numerous pancakes of sand 10-15 cm in diameter which were coated by several milimeters of asphalt.

At the base of plant stems which were cut, asphalt present was tacky to the touch. The asphalt had not contaminated new plant stems.

Where asphalt persisted on marsh sediments, exposure to the sun produced a sheen on the soil surface.

In general, the marsh has recovered very well from both the asphalt spill and the clean-up operations.

Considering the lack of asphalt degridation on plant stems not removed from the marsh, and the high wter foul use of the area, the decision to cut the marsh grass appears sound.

A limiting factor controling the use of this clean-up technique may be the ability of the sediment surface to withstand the effects of work crews.

ECOLOGICAL DAMAGE ASSESSMENT OF OIL AND HAZARDOUS MATERIALS SPILLS

QUESTIONNAIRE

NOAA/ERL/MESA
NSTL Station, MS 39529

NAME:

TITLE:

PHONE: business:

home:

ORGANIZATION NAME:

type of organization:

academic_____ federal agency_____
non-profit____ state/local govt.____
industrial____

ADDRESS:

FIELD OF EXPERTISE:

A) Physical Processes_____

_____ 1. physical properties of sea water
_____ 2. waves and tides
_____ 3. water masses and currents
_____ 4. oil slick movement
_____ 5. other (explain)

B) Chemical Processes_____

_____ 1. chemical composition of sea water
_____ 2. oil identification (hazardous materials) _____
_____ 3. oil detection (hazardous materials) _____
_____ 4. oil weathering
_____ 5. sediment analysis
_____ 6. effects of dispersents
_____ 7. sample analysis (oil) _____ (hazardous materials)____
_____ 8. other (explain)

C) Biological Processes _____

_____ 1. intertidal/estaurine biology
_____ 2. community analysis
_____ 3. microbiology/biodegridation
_____ 4. histopathology
_____ 5. laboratory toxicity
_____ 6. fisheries
_____ 7. birds/mammals
_____ 8. phycology
_____ 9. plankton
_____ 10. seagrasses
_____ 11. coral reefs
_____ 12. other (explain)

D) Geological Processes _____

_____ 1. sedimentology

E) Remote Sensing _____

_____ 1. sampling
_____ 2. interpretation/analysis
_____ 3. areal
_____ 4. satelite

F) Socioeconomic Studies _____

_____ 1. sociology
_____ 2. economics

G) Legal Considerations_____

APPLICABLE HABITATS OF STATED EXPERTISE:

A) Fresh Water _____

_____ 1. lentic
_____ 2. lotic

B) Coastal Marine _____

_____ 1. water column
_____ 2. intertidal
_____ 3. reefs (ie. oyster, fishing)
_____ 4. benthos
_____ 5. estuaries
_____ 6. marshes
_____ 7. mangroves

C) Offshore _____

_____ 1. air/sea interface
_____ 2. water column
_____ 3. reefs
_____ 4. benthos

Please briefly explain how your present research, or interests, relate to the study of oil and hazardous materials in the environment. List relevent publications. Please include any available.

EQUIPMENT AVAILABLE FOR STUDIES:

A) Transportable to scene of a spill

_____ 1. sampling gear (please indicate types and numbers)

_____ 2. small boats (quick description)

_____ 3. surface transportation (pick-ups, 4x4, etc.)
range of operation

description

_____ 4. aircraft

_____ fixed wing (model)
payload_____
remote sensing ability ___yes ___no

_____ rotatory wing (model)
payload_____
remote sensing ability ___yes ___no

B) Laboratory Facilities:

_____ 1. fixed _____ 2. mobile

Capabilities:

_____ 1. physical oceanography
_____ 2. biological oceanography
_____ 3. chemical oceanography
_____ 4. geological oceanography
_____ 5. bioassay work (flow through/static)
maximum sample output (1 day, 1 week, etc.)
by category of hydrocarbon analysis, oil
identification, etc.

Current research/operational activities.
Please include a listing of the major
analytical equipment on hand.

ABILITY TO RESPOND TO A SPILL SITE:

A) Personnel:

_____ 1. within 24 hr _____ 3. specify
_____ 2. within 48 hr _____ 4. not willing to respond

If more than one person is able to respond:

_____ # of people
category of thier expertise (use letters & numbers ie.
A2 = physical processes, waves and tides)

B) Equipment

Transportable to scene; mobilization time
_____ 1. within 24 hr _____ 3. specify time
_____ 2. within 48 hr _____ 4. range

Laboratory facilities:
_____ 1. emergency support
_____ 2. long term studies

C) Limitations to Response

1. Geographical area (specify)

2. Transportation to scene

3. Financial; please indicate what contractual arrangements would be necessary before personnel or equipment could respond to a spill. Include contracting agent where appropriate. Indicate possible institutional constraints.

Oil Spill Trajectory Models

Oil trajectory modeling is a computer technique by which the location and movement of an oil slick is predicted. Model predictions are based on vector addition of forces which move oil, including winds, tides and semi-permanent currents. Differences among models are due to sources of data and ways in which the models treat data.

Trajectory models are of two basic types : forecast and risk. Forecast models use predictions of wind and tidal conditions to forecast the location of an oil slick. Risk models use historical data and averages to predict the probable movement of a slick. An example of each model type follows.

The U.S. Coast Guard research and development division has developed a prediction trajectory model.[6] Trajectories are based on oil diffusion, convective movement and wind effects. Information on the time spillage occurred and ended, amount of oil spilled, oil flow rate, wind speed and direction and local current data are necessary for model operation. The model is cummulative predictive; forecast can be made for several days in advance without continuous reference to slick location.

Operational use of the model is through the Oceanographic unit of the Coast Guard in Washington, D.C.

Peter Cornillan and Malcon Spaulding of the University of Rhode Island have developed a trajectory model which accounts for surface and subsurface transport of oil. The model is designed so that the type and detail of input data can be varied according to what is available. The more detailed the historical information available, the more refined the model output.

The surface and subsurface predictions of the model can be obtained separately.

The surface section considers wind stress, spreading and oil evaporation. These parameters are refined to an accuracy which is equal to that of the environmental data available for input. Determination of subsurface transport is complex. A lack of information on entrainment has delayed the refinement of this model aspect.

The model is available for use through the University of Rhode Island.

References

1. Public Law 92-500 Federal Water Pollution Control Act. section 311(b)(1)
2. Title 40, Chapter V, Part 1510. National Oil and Hazardous Substances Pollution Contingency Plan.
3. Announcement of the Southeastern Oil Spill Response Workshop. 12-14 December 1978 Kiawah Island, S.C.
4. Annex to Contingency Plans for the Gulf of Mexico:
5. Ibid.
6. Issure, Ivan. 1978. U.S. Coast Guard Research Center, Groton, Conn. personal Communications
7. Cornillan, Peter 1978. University of Rhode Island, Kingston, R.I. personal communications