# TESORO HIGH PLAINS PIPELINE LLC

# PIPELINE SPILL RESPONSE PLAN

***Prepared by:***

**Tesoro High Plains Pipeline**
**11071 32nd Street, SW**
**Dickinson, ND 58602**

***Submitted: May 2002***
***Revised: May 2013***

# STATEMENT OF CORPORATE COMMITMENT

## PIPELINE SPILL RESPONSE PLAN
## TESORO LOGISTICS OPERATIONS LLC
## PRODUCTS PIPELINE TRANSMISSION & GATHERING SYSTEM

The Pipeline Oil Spill Response Plan has been prepared for operation of the Tesoro High Plains Pipeline Crude Oil Transmission Line & Gathering System located in North Dakota and Montana, USA.

**Management Approval and Manpower Authorization**

The necessary resources to implement this Response Plan are hereby committed. In the event of oil spilled for which Tesoro Logistics Operations LLC is responsible, best efforts will be initiated to expeditiously control and remove any harmful quantity of oil discharged. Tesoro Logistics Operations LLC will adopt and use the local Area Contingency Plan (ACP) in conjunction with this Response Plan. Copies of the Response Plan are kept on-site and ready for use by Tesoro Logistics Operations LLC personnel. This document will be evaluated annually to be sure they are current and updated as necessary.

Greg D. Henderson
GM, Pipeline & Terminal Operations

5-10-13
Date

PHMSA, 000005085



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# INTRODUCTION

## Purpose and Scope

The purpose of this Response Zone Plan (hereinafter referred to as "Plan") is to assist Tesoro Logistics Operations LLC (hereinafter referred to as "Tesoro") prepare for and respond quickly and safely to a discharge originating from the Tesoro High Plains Pipeline (hereinafter referred to as "THPP"). This Plan provides techniques and guidelines for achieving an efficient, coordinated, and effective response to a discharge incident which may occur along the THPP's gathering and transmission system to satisfy North Dakota state statutes and federal oil spill planning requirements of the Pipeline & Hazardous Materials Safety Administration (PHMSA) established by the Oil Pollution Act of 1990 (OPA 90). A cross-reference to PHMSA regulations is included at the end of this section.

This Plan when implemented is capable of protecting natural resources of the United States. The Plan is designed to illustrate Tesoro's capability to ensure prompt and proper removal of oil and to minimize environmental damages.

The Plan has been prepared so that procedures are in compliance with the National Contingency Plans (NCP) which establishes criteria and guidelines for the response to an oil spill. It is intended to be used in conjunction with the EPA Region VIII Integrated Contingency Plan and its Red River Valley Sub-Area Contingency Plan as reviewed by Tesoro.

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This Plan consists of two parts:

1. Part 1-Emergency Response Action Plan (Core) presents the fundamental elements of spill response and outlines initial actions and spill reporting procedures, provides emergency telephone numbers, and presents spill response strategies.

2. Part 2 Response Management Plan describes the procedures to be used in protection and cleanup and provides the forms for completion of the Incident Action Plan.

## A. Record of Revisions

**OIL SPILL CONTINGENCY PLAN**
**TESORO HIGH PLAINS PIPELINE**

| **Last Revision**/*(or Review Date)** | **Revised/Reviewed by Contingency Planning Specialist** |
|---|---|
| **001 – March 2004** | John M. Nixon |
| **002 – November 2005** | John M. Nixon |
| *November 2006 (reviewed only)* | John M. Nixon |
| **003 – December 2007** | John M. Nixon |
| *November 2008 (reviewed only with minor name changes)* | John M. Nixon |
| *October 2009 (reviewed only)* | John M. Nixon |
| **004 – October 2010** | John M. Nixon |
| **005 – February 2011** | Hannah Adams |
| **006 – April 2011** | Hannah Adams |
| **007 – August 2012** | Hannah Adams |
| **008 –May 2013** | Tracy Cowan/Gary Oversen/Greg Andersen |

* Bolded date indicates latest revision date to the plan. A non-bolded *italicized date* (in parentheses) indicates the date the plan was last reviewed (with no revision necessary) and it will not match the date on the "Statement and Corporate Commitment" page found on page 3 of the plan.

## B. Distribution List

| Distribution | Name | Address | Type |
|---|---|---|---|
| DOT PHMSA, Environmental Planning Officer, Office of Pipeline Safety | Melanie Barber | 1200 new Jersey Ave., SE<br>Room E22-210<br>Washington, DC 20590 | 2 electronic copies |
| Manager, Crude Pipeline & Terminals | Gary Oversen | P.O. Box 1207<br>Dickinson, ND 58602 | 1 hard copy |
| Supervisor Pipeline Operations | Greg Andersen | P.O. Box 1207<br>Dickinson, ND 58602 | 1 hard copy |
| NuStar San Antonio Operations Center | James Bowen/<br>Gary Walker | 2330 North Loop 1604 W<br>San Antonio, TX 78248 | 2 hard copies<br>1 electronic copy |
| Director of Contingency Planning and Emergency Response | Eric Haugstad | 19100 Ridgewood Parkway<br>San Antonio, TX 78259 | 1 hard copy |
| Senior Emergency Response Coordinator | Jamie Reinholt | 900 Old Red Trail Road<br>Mandan, ND 58554 | 1 hard copy |

Hard Copies = 4 Electronic Copies = 3

## C. Cross Reference - PHMSA Planning Requirements

| PHMSA Reference 49 CFR Part 194 | Description | FSRP Section |
|---|---|---|
| 194.103 | Significant and Substantial Harm | 1.1.4 |
| 194.105 | Worst Case Discharge | 1.1.7 |
| 194.107 | General Response Plan Requirements | |
| 194.107 (a) | Resources for a Worst Case Discharge | 1.10 |
| 194.107 (b) | Consistency with NCP and ACP | Introduction |
| 194.107 (c)(1) | Core Plan | |
| 194.107 (c)(1)(i) | Information Summary | 1.1 |
| 194.107 (c)(1)(ii) | Immediate Notification Procedures | 1.2 |
| 194.107 (c)(1)(iii) | Spill Detection and Mitigation | 1.1, 1.6 |
| 194.107 (c)(1)(iv) | Oil Spill Response Organization | 1.2, 1.10 |
| 194.107 (c)(1)(v) | Response Activities and Resources | 1.6, 1.10 |
| 194.107 (c)(1)(vi) | Federal, State and local Agencies | 1.2 |
| 194.107 (c)(1)(vii) | Training | 1.8 |
| 194.107 (c)(1)(viii) | Equipment Testing | 1.10 |
| 194.107 (c)(1)(ix) | Drills | 1.8 |
| 194.107 (c)(1)(x) | Plan Review and Update | 1.9 |
| 194.107 (c)(2) | Response Zone Specific Information | 1.1 |

**C. Cross Reference - PHMSA Planning Requirements (*continued*)**

| PHMSA Reference 49 CFR Part 194 | Description | FSRP Section |
|---|---|---|
| 194.113 | Information Summary | 1.1 |
| 194.113 (a) | Core Plan | Part 1 |
| 194.113 (a)(1) | Name and Address | 1.1.1 |
| 194.113 (a)(2) | Description of Response Zone | 1.1.2 |
| 194.113 (b) | Response Zone Appendix | 1.1 |
| 194.113 (b)(1) | Core Plan Information Summary | 1.1 |
| 194.113 (b)(2) | Qualified Individual | 1.1.3 |
| 194.113 (b)(3) | Description of Response Zone | 1.1.2 |
| 194.113 (b)(4) | List of Line Criteria | 1.1.2 |
| 194.113 (b)(5) | Harm Criteria | 1.1.4 |
| 194.113 (b)(6) | Type and Volume of Oil for WCD | 1.1.5, 1.1.6 |
| 194.115 | Resource Resources | 1.10 |

**C. Cross Reference - PHMSA Planning Requirements (*continued*)**

| PHMSA Reference 49 CFR Part 194 Appendix A | Description | FSRP Section |
|---|---|---|
| Section 1 | Information Summary | 1.1 |
| Section 1 (a) | Core Plan | Part I |
| Section 1 (b) | Response Zone Appendix | 1.1 |
| Section 1 (c) | Certification | 1.1.7 |
| Section 2 | Notification Procedures | 1.2 |
| Section 2 (a) | Notification Requirements | 1.2 |
| Section 2 (b) | Prioritized Checklist | 1.2 |
| Section 2 (c) | Personnel and Agencies to Notify | 1.2 |
| Section 2 (d) | QI Notification | 1.2 |
| Section 2 (e) | Communication Methods | 1.4 |
| Section 2 (f) | Information to be provided | 1.2 |
| Section 3 | Spill Detection and Mitigation | 1.6, |
| Section 3 (a) | Initial Detection | 1.6, |
| Section 3 (b) | Initial Procedures | 1.1, 1.6 |
| Section 3 (c) | List of Equipment | 1.10 |
| Section 3 (d) | 24-hr. Contacts for Equipment | 1.2 |
| Section 3 (e) | 24-hr. Contacts for Personnel | 1.2 |

**C. Cross Reference - PHMSA Planning Requirements (*continued*)**

| PHMSA Reference 49 CFR Part 194 Appendix A | Description | FSRP Section |
|---|---|---|
| Section 4 | Response Activities | 1.6, Part II |
| Section 4 (a) | Responsibilities of Operating Personnel | Appendix C |
| Section 4 (b) | QI Responsibilities | 1.5 |
| Section 4 (c) | Coordination | 1.5 |
| Section 4 (d) | Response Resources | 1.10 |
| Section 4 (e) | OSRO Equipment and Personnel | 1.10 |
| Section 5 | List of Contacts | 1.2 |
| Section 5 (a) | Personnel | 1.2 |
| Section 5 (b) | QI | 1.2 |
| Section 5 (c) | Insurance Representative | 1.2 |
| Section 5 (d) | Response Resources | 1.2 |
| Section 6 | Training | 1.8 |
| Section 7 | Drill Procedures | 1.8 |
| Section 7 (a) | Announced and Unannounced | 1.8 |
| Section 7 (b) | Type of Drills | 1.8 |
| Section 7 (b)(1) | Manned Facility Notification | 1.8 |
| Section 7 (b)(2) | Unmanned Facility Notification | 1.8 |
| Section 7 (b)(3) | Table Top | 1.8 |
| Section 7 (b)(4) | Equipment Deployment | 1.8 |
| Section 7 (b)(5) | Entire Plan | 1.8 |

## C. Cross Reference - PHMSA Planning Requirements (*concluded*)

| PHMSA Reference 49 CFR Part 194 Appendix A | Description | FSRP Section |
|---|---|---|
| Section 8 | Plan Review and Update | 1.9 |
| Section 8 (a) | Procedures to meet 49CFR194.121 | 1.9 |
| Section 8 (b) | Following a WCD | 1.9 |
| Section 9 | Response Zone Appendix | 1.1 |
| Section 9 (a) | QI | 1.5 |
| Section 9 (b) | Notification Procedures | 1.2 |
| Section 9 (c) | Spill Detection and Mitigation | 1.1, 1.6, |
| Section 9 (d) | Response Resources | 1.10 |
| Section 9 (e) | Response Actions | 1.6, Part II |
| Section 9 (f) | Agency Contacts | 1.2 |
| Section 9 (g) | Worst Case Discharge | 1.1.6 |
| Section 9 (h) | WCD Calculations | 1.1.6 |
| Section 9 (i) | Pipeline Drawing | Figures 1.1-1 |
| Section 9 (j) | Pipeline Diagram | Figures 1.1-1 |
| Section 9 (k) | Product Description | 1.1.5 |

# PART I
# EMERGENCY RESPONSE ACTION PLAN

This section contains information necessary to support emergency response activities which are conducted to gain control of the incident (e.g., crisis management). Examples of emergency response activities include source control, assessment, emergency response organization, mobilization of response resources, and the protection of sensitive areas.

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## 1.1 PIPELINE INFORMATION SUMMARY

### 1.1.1 Owner and Operator

**Name and Address of Owner**

Tesoro Logistics Operations LLC
19100 Ridgewood Parkway
San Antonio, Texas 78259
(210) 626-6000

**Name and Address of Operator**

Tesoro High Plains Pipeline LLC

11071 32nd Street SW
Dickinson, ND 58602
(701) 225-8973
(701) 483-9488 Fax

NuStar San Antonio Operations Center*
2330 North 1604 Loop West
San Antonio, TX 78248
(800) 775-2632
(210) 918-4937 (24 hr)

(b) (7)(F) [redacted]

### 1.1.2 Description of Response Zone

The Tesoro High Plains Pipeline (THPP) includes approximately 221-mile Trunk Line running from the Canadian Border in the Northwest corner of the state to Tesoro Mandan Refinery located in Mandan, North Dakota and a 200 mile crude oil gathering system. Figure 1.1-1 shows a map of the THPP Gathering and Transmission System.

One response zone has been established for the THPP pipeline gathering and transmission system. A summary of the pipeline sections/segments are presented in Tables 1.1-3 and 1.1-4.

Tesoro has made the main-line from Dunn Center to Black Slough bi-directional flow. The gathering systems is also bi-directional flow. This does not change the worst case discharge identified in this section.

**THPP Response Zone**

DOT Trunk Pipelines
The system collects crude oil from various gathering locations, and can deliver crude at the Ramberg to Enbridge Pipeline and to the Tesoro Mandan Refinery. The trunk line is approximately 221 miles in length and consists of 6, 8, 12, and 16-inch diameter pipelines.

DOT Gathering System
The DOT-jurisdictional gathering pipeline system consists of 6 and 8-inch diameter pipelines, which are approximately 200 miles in length. The DOT gathering pipelines collect crude oil

from various gathering locations located in Eastern Montana and Western North Dakota. The crude oil is transported from the DOT gathering pipelines into the DOT trunk pipeline for delivery to Tesoro's Mandan Refinery in Mandan, ND.

**Terrain**

The lines run through high plains, semi-arid rolling country with a few low mountains and some national grassland areas. Most of the land under cultivation is used to raise wheat and hay. Most of the remainder is pastureland. There is some irrigated farming especially along the Missouri River. Elevations range from 1,952 feet at Lignite Station (MP 202.23) to 2,414 feet at Keene Station (MP 127.70) to a low of 1,715 feet at the Mandan Refinery on the Trunk Line.

**River and Stream Crossings**

There are a number of drainage ditches and gullies that have water in them only when it rains or during the spring run-off and a few streams that have water in them all of the time. The waterway crossings are listed in Table 1.1-1 and described by nearest mile post (MP), elevation, name and nearest town. The Missouri and Little Missouri are both major streams.

**Population Exposure**

The population exposure across the majority of this system is extremely minimal; crossing open farmland, ranchland and Indian reservations, no major highways, and runs more than two miles away from almost all towns. Population exposure is primarily in the Mandan area where the line terminates. Thus hazards associated with a leak on/near the Missouri River may receive significant attention from State regulatory agencies as well as the media. Towns and areas where population/media exposure could be significant are listed in Table 1.1-2.

### 1.1.3 High Consequence Areas (HCA)

The most recent documented HCA maps and tables can be found in Appendix E.

**Table 1.1-1**

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**Table 1.1-2**
**Major Population Areas in the THPP Response Zone**

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## Table 1.1-3
## Pipelines Response Zone by Line Sections

| BV/Station South | MP South | BV/Station North | County | MP North | Pipe Dia (inches) | Distance (miles) | Linefill (bbl) | Estimated Time (hrs) | Flowrate (BPH) |
|---|---|---|---|---|---|---|---|---|---|
| Mandan Station | | Mandan North Block Valve MOV | | | | | | | |
| Mandan North Block Valve (9 mil) | 9.07 | South Knife River (Beulah BV) | Morton | 45.99 | 16 | 36.92 | 45,495 | .25 | 3200 |
| South Knife River (Beulah BV) | 45.99 | North Knife River (Zap BV) | Mercer | 55.78 | 16 | 9.79 | 13,229 | .25 | 3200 |
| North Knife River (Zap BV) | 55.78 | South Side Spring Creek | Mercer | 67.18 | 16 | 11.4 | 15,413 | .25 | 3200 |
| South Side Spring Creek | 67.18 | Dodge Station | Dunn | 68.55 | 16 | 21.11 | 28,541 | 1.25 | 3200 |
| Dodge Station | 68.55 | Dunn Center Station | Dunn | 88.29 | 16 | 19.74 | | .25 | 3000 |
| Dunn Center Station | 88.29 | Voigt MLV (South Side Little Missouri River) | Dunn | 93.66 | 12 | 5.37 | 4,132 | .50 | 2700 |
| Voigt MLV (South Side Little Missouri River) | 93.66 | Berthold Junction MLV (North Side Little Missouri River) | Dunn | 95.1 | 12 | 1.44 | 1,057 | .25 | 2700 |
| Berthold Junction MLV (North Side Little Missouri River) | 95.1 | Johnson Corner | McKenzie | 120.65 | 12 | 25.55 | 19,681 | .25 | 2700 |
| Johnson Corner | 120.65 | Blue Butte Station | McKenzie | 125.69 | 12 | 5.04 | 4,160 | .25 | 2700 |
| Blue Butte Station | 125.69 | Keene Station | McKenzie | 127.7 | 12 | 1.99 | 1,251 | .25 | 2700 |
| Keene Station | 127.7 | Charlson Station Block Valve | McKenzie | 135.2 | 12 | 7.43 | 5,721 | .50 | 1600 |
| Charlson Station Block Valve | 135.2 | South Side Missouri River/Yttredahl MLV | McKenzie | 142.72 | 12 | 7.61 | 5,680 | 1.00 | 2200 |

| BV/Station South | MP South | BV/Station North | County | MP North | Pipe Dia (inches) | Distance (miles) | Linefill (bbl) | Estimated Time (hrs) | Flowrate (BPH) |
|---|---|---|---|---|---|---|---|---|---|
| South Side Missouri River/Yttredahl MLV | 142.72 | North Side Missouri River/Zok | Williams | 145.23 | 12 | 2.51 | 1,787 | .25 | 3000 |
| North Side Missouri River/Zok | 145.23 | Dry Fork Creek | Williams | 148.35 | 12 | 9.42 | 4,761 | .25 | 3000 |
| Dry Fork Creek | 148.35 | Ramberg Junction | Williams | 154.65 (47.7 from Lignite) | 12 | 6.3 | | Confined space entry required to operate valve | 3000 |
| Ramberg Junction | 154.65 | Tioga Station | Williams | 162.63 (39.67 from Lignite) | 8 | 7.98 | 2,671 | .75 | 2200 |
| Tioga Station | 162.63 | Battleview Station | Burke | 180.23 (22.01 from Lignite) | 6 | 17.6 | 1,796 | .50 | 1200 |
| Battleview Station | 180.23 | Black Slough Foothills | Burke | 10.82 | 6 | 10.82 | 10.82 | 1.00 | 600 |
| Black Slough Foothills | | Lignite Station | Burke | 202.22 (7.6 from Border) | 8 | | 2,673 | | |
| Lignite Station | 202.22 | Border Block Valve | Burke | 197.63 | 8 | | | | |
| Border Block Valve | 197.63 | Black Slough | Burke | | 8 | | | | |
| | | | | | | | | | |
| **Alexander to Keene** | | | | | | | | | |
| Tower Hill | | | | | | | | 2.25 | 370 |
| Garden Church | | | | | | | | 2.00 | 370 |
| Keen Station | | | | | | | | 1.00 | 370 |
| | | | | | | | | | |
| **Fairview to Putnam** | | | | | | | | | |
| Fairview station | | | | | | | | 1.25 | 360 |
| Highway 16 | | | | | | | | 1.00 | 360 |
| Putnam Station | | | | | | | | 1.25 | 360 |
| | | | | | | | | | |
| **Richey to Putnam** | | | | | | | | | |
| Richey Station | | | | | | | | 2.00 | 400 |
| South Fax Creek | | | | | | | | 1.50 | 400 |
| Fox Creek | | | | | | | | 1.50 | 400 |
| Highway 200 | | | | | | | | 1.25 | 400 |
| Putnam Station | | | | | | | | 1.25 | 400 |
| | | | | | | | | | |
| **Tree Top to Dunn Center** | | | | | | | | | |

| BV/Station South | MP South | BV/Station North | County | MP North | Pipe Dia (inches) | Distance (miles) | Linefill (bbl) | Estimated Time (hrs) | Flowrate (BPH) |
|---|---|---|---|---|---|---|---|---|---|
| Hwy 85 | | | | | | | | 1.00 | 1000 |
| Romanyshyn | | | | | | | | 1.00 | 1000 |
| Midpoint | | | | | | | | .25 | 1000 |
| Hwy 200 | | | | | | | | .50 | 1000 |
| Grant Carlson | | | | | | | | .50 | 1000 |
| | | | | | | | | | |
| **Tree Top to Fryburg** | | | | | | | | | |
| Frank Creek North | | | | | | | | 1.50 | Idled |
| Franks Creek South | | | | | | | | 1.50 | Idled |
| Government Creek | | | | | | | | 1.50 | Idled |
| | | | | | | | | | |
| **Little Knife to Dunn Center** | | | | | | | | | |
| Gartner | | | | | | | | .50 | 750 |
| Grant Carlson | | | | | | | | .50 | 750 |
| | | | | | | | | | |
| **Poker Jim to Tree Top** | | | | | | | | | |
| Goldsberry | | | | | | | | 1.50 | 650 |
| Hall Road | | | | | | | | 2.50 | 650 |
| Little Missouri West | | | | | | | | 3.00 | 650 |
| Whitetail | | | | | | | | 2.00 | 650 |
| Ebert | | | | | | | | .25 | 650 |
| Elkhorn | | | | | | | | 1.25 | 650 |
| 4-Eyes | | | | | | | | 1.25 | 650 |
| | | | | | | | | | |
| **Sidney to Poker Jim** | | | | | | | | | |
| Sidney Station Launcher | | | | | | | | .75 | 750 |
| Benny Peer Stateline | | | | | | | | Confined Space Entry required to operate valve | 750 |
| Klandal | | | | | | | | “ “ | 750 |
| Spring Creek | | | | | | | | “ “ | 750 |
| Hatter | | | | | | | | “ “ | 750 |
| Yates Hill | | | | | | | | “ “ | 750 |
| Poker Jim Receiver | | | | | | | | 2.25 | 750 |
| | | | | | | | | | |
| **Putnam to Sidney** | | | | | | | | | |
| Putnam Launcher | | | | | | | | 1.25 | 750 |
| Peterson | | | | | | | | 1.00 | 750 |
| W. Yellowstone River | | | | | | | | 1.00 | 750 |
| E. Yellowstone River | | | | | | | | 1.00 | 750 |

| BV/Station South | MP South | BV/Station North | County | MP North | Pipe Dia (inches) | Distance (miles) | Linefill (bbl) | Estimated Time (hrs) | Flowrate (BPH) |
|---|---|---|---|---|---|---|---|---|---|
| Sidney Station | | | | | | | | .75 | 750 |
| | | | | | | | | | |
| **Sidney to Alexander** | | | | | | | | | |
| Sidney Station | | | | | | | | .25 | 430 |
| Windmill | | | | | | | | 1.00 | 430 |
| Compressor Station | | | | | | | | 1.50 | 430 |
| Station 11 | | | | | | | | 1.50 | 430 |
| Cartwright | | | | | | | | 1.5 | 430 |
| Iverson | | | | | | | | 1.75 | 430 |
| Anita Monson | | | | | | | | 2.00 | 430 |
| Alexander West | | | | | | | | 2.25 | 430 |

## Table 1.1-4
## THPP Gathering System Resp

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| NAME | ANSI | VALVE SIZE | ELEV FEET |
|---|---|---|---|
| | | | Richey - Put |
| Richey | 600 | 6-inch | 2870 |
| MT Highway 200 | 600 | 6-inch | 2665 |
| South Fox Creek | 600 | 6-inch | 2440 |
| Putnam Station | 600 | 6-inch | 2358 |
| | | | Sidney – Ke |
| Sidney | 300 | 6-inch | 1939 |
| Wind Mill | 300 | 6-inch | 2615 |
| Compressor Station Site 6 to 4 | 300 | 6-inch | 1976 |
| Section 11 4 x 6 | 300 | 6-inch | 2033 |
| Cartwright Station | 300 | 6-inch | 1910 |
| Iverson | 600 | 6-inch | 2080 |
| Anita Monson | 600 | 6-inch | 2087 |
| Receiver Alexander Station / Launcher Alexander to Keene | 600 | 6-inch | 2036 |
| Tower Hill | 600 | 6-inch | 2350 |

(b) (7)(F) [redacted]

(b) (7)(F) [redacted]

| NAME | ANSI | VALVE SIZE | ELEV FEET |
|---|---|---|---|
| Garden Church | 600 | 6-inch | 2119 |
| Keene Station Receiver | 600 | 6-inch | 2420 |
| | | | **Putnam - Sid** |
| Hardy School | 600 | 8-inch | 1872 |
| West Side Yellowstone River | 600 | 8-inch | 1860 |
| East Side Yellowstone River | 600 | 8-inch | 1860 |
| Sidney Station | | | |
| | | | **Sidney – Poke** |
| Benny Peer Stateline Sidney South | 600 | 8-inch | 1624 |
| Benny Per Klandel 4 Mile | 600 | 8-inch | 1628 |
| Hatter10 Mile | 600 | 8-inch | 2192 |
| Spring Creek Tesoro - Bearpaw 12 Mile | 600 | 8-inch | 2264 |
| Yates Hill | 600 | 8-inch | 2482 |
| | | | **Poker Jim – Misso** |
| Poker Jim Station | | | |
| Hall Road | 600 | 8-inch | |

(b) (7)(F) [redacted]

| NAME | ANSI | VALVE SIZE | ELEV FEET |
|---|---|---|---|
| Goldsbery | 600 | 8-inch | |
| Little Missouri BV (West) | 600 | 8-inch | |
| Ebert MOV (East side of River) | 600 | 8-inch | |
| | | | Sidney - Cartw |
| Wind Mill | 300 | 6-inch | 2615 |
| 6-inch-4-inch Block valve | 300 | 6-inch | 1973 |
| 4-inch-6-inch block valve | 300 | 6-inch | 1943 |
| Cartwright Station | | | |
| | | | Cartwright - Ale |
| Lassey-Erickson | 600 | 6-inch | 2100 |
| Iverson | 600 | 6-inch | 2080 |
| Anita-Monson | 600 | 6-inch | 2087 |
| Alexander Block Valve (west side of Station) | 600 | 6-inch | 2054 |

(b) (7)(F) [redacted]

### 1.1.4 Name and Phone Number of the Qualified Individual

*The Primary Qualified Individual is:*
**Gary Oversen**
**Manager, Crude Pipeline & Trucking**
(701) 225-8973 ext. 101– Office
(b) (6) [redacted]
(701) 690-3438 – Cellular

*The Alternate Qualified Individual is*:
**Greg Andersen**
**Supervisor Pipeline Operations**
(701) 225-8973 ext. 102– Office
(b) (6) [redacted]
(701) 260-2975 – Cellular

### 1.1.5 Determination of Substantial Harm

The Tesoro High Plains Pipeline may cause significant and substantial harm (as defined in 49 CFR 194.103 (c)) to the environment in the event of a release due to its close proximity to navigable waters of the United States. Sensitive resources exist along the pipeline route. The THPP Response Zone is 6, 8, 12, and 16 inches in diameter and 221 miles long. Detailed descriptions of the response zone and line sections are provided in Appendix C.

### 1.1.6 Type of Oil

Group 2 crude oil is transported through the THPP. Material Safety Data Sheets (MSDS) are presented in Appendix D.

### 1.1.7 Volumes of Worst Case Discharge (WCD)

Federal planning requirements identify three methods to calculate the Worst Case Discharge (WCD) for a pipeline system. These criteria, identified in 49 CFR 194.105 (b), include planning volumes based on:

1. maximum flow rate, release time, line drainage and shutdown time;
2. a historic discharge; and
3. breakout tank capacities (adjusted for spill prevention measures).

<u>Breakout tanks - Main Truck Lines</u>

(b) (7)(F) [redacted]

(b) (7)(F)

[redacted]

(b) (7)(F)

[redacted]

Due to the volume reductions for breakout tanks described above, and the fact that there has not been a significant historic discharge from the pipeline, the WCD Planning Volumes have been calculated according to the requirements of 49 CFR 194.105(b)(1). Established procedures in the event of an actual spill will limit the amount spilled. These procedures include shutdown of upstream pump station(s), allowing downstream pump station(s) to continue operation until low suction triggers automatic shutdown, and closing appropriate valves to isolate the leak. In addition, Tesoro routinely tracks meter over and shorts, performs weekly aerial patrols, and participates in state one-call programs. Though it is extremely unlikely for a spill of the

magnitude outlined by WCD calculations to occur, Tesoro recognizes this procedure as a valuable planning tool.

**THPP Response Zone**

(b) (7)(F) [redacted] The worst case discharge (WCD) volume was calculated for the 16-inch diameter pipeline within the South Knife River Block Valve (MP 45.99) to Mandan North Block Valve (MP 9.07) Line Section according to the requirements in §194.105(b)(1). The line section contains no breakout tanks and there have been no significant historic discharges from the pipeline. Therefore, the worst case discharge volume is based on the maximum pumping rates, shutdown and response times, and line drainage volume under adverse weather conditions.

The maximum shutdown response time of 1.5 hours represents the longest time that Field Specialists could respond in adverse weather to manually close valves. Response times have been calculated to consider adverse weather such as snowstorms.

(b) (7)(F) [redacted]

[redacted]

(b) (7)(F) [redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

## 1.1.8 Recognizing Abnormal Conditions

All operating and maintenance personnel must be capable of recognizing and reporting any

conditions that could result in the substantial threat of a discharge.

Unintended or unexplainable events caused by the failure of operating equipment that results in exceeding the design limits of a pipeline system, but are not immediately identified as emergencies are abnormal conditions.

Explainable events caused by an upset condition on the pipeline system which do not exceed design limits are not identified as abnormal conditions. In most cases, these explainable events can be cleared by the Control Center Operator.

In all cases, the Operator must thoroughly analyze these events and take appropriate corrective action to prevent hazards to the public, employees, the environment, and/or the pipeline system. Those events potentially involving equipment failure or those which cannot be cleared from the Control Center will be referred to the appropriate field maintenance personnel as an ***abnormal condition*** for further investigation and resolution.

Specific procedures for abnormal operations at stations and block valves are presented in Appendix C.

## Detection, Investigation of and Response to Abnormal Conditions

### Unintended Valve Closure

(b) (7)(F) [redacted]

*SOC (*(b) (7)(F) [redacted] *Operator Responsibilities*

(b) (7)(F) [redacted]

- Determine if the facility involved has any other failures (e.g., electrical or mechanical alarms, high receiving tank alarm, etc.).

(b) (7)(F) [redacted]

- If the valve will not re-open, attempt to relieve any excessive pressure by whatever means necessary while minimizing product contamination.
- Contact appropriate maintenance personnel to investigate and correct the problem and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.

- Once the valve is re-opened and it is safe to resume operations, restart the line.

**Unintended Station Shutdowns**

Unintended station shutdowns can be caused by any number of factors including low suction or high case/ discharge pressures, power failures (even those of very short duration), or the operation of any safety device.

*SOC Operator Responsibilities*

- Determine the cause of the shutdown. If the station shutdown is caused by the operation of a safety device, refer to the subsection below entitled "Operation of a Safety Device."
- Verify the other station(s) on the system are operating normally.
- If the fault is resettable, reset (clear) the station fault if it is safe to do so.
- If the fault condition cannot be cleared and the station is needed for current operations, contact appropriate maintenance personnel to investigate and correct the problem and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.
- The station can be re-started only after the cause(s) of station shutdown is determined, corrected, and the SOC Operator has verified it is safe to do so.

**Communication Problems**

Communication problems result from either a partial or a total communication outage. Partial communication outages do not necessarily prevent safe operation of a pipeline system, provided adequate information is received from other locations on the system. Total outages are more serious since they prevent the safe operation of the pipeline system.

(b) (7)(F) [redacted] has an unexpected or unscheduled outage (partial outage of 5 minutes or more or a total outage of any duration):

Contact a (b) (7)(F) [redacted] Operator for assistance. The Operator will follow through until the problem is corrected.

(b) (7)(F) [redacted]

operated safely

- the outage is at a critical location and the system cannot continue to be operated safely

If the outage continues but the system can be operated safely (e.g. not a total outage nor a partial outage at a critical location), call the appropriate maintenance personnel and/or the Facilitator the next morning (if not a regular work day).

If maintenance personnel are called out to investigate and correct the problem, document the

event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.

### Abnormal Flow/Pressure Deviations

The SOC Operator will review line operations and determine whether or not a deviation meets the abnormal condition definition.

Flow and pressure deviations are typically the first indications of potential abnormal operating conditions. ***It is the SOC Operator's responsibility to closely monitor the pipeline system so that abnormal deviations from steady-state or normal operations can be detected as soon as possible.*** Flow and pressure deviations which require further investigation include:

- Line balance (over/short) calculations indicating discrepancies in commodity receipts into a system and deliveries from that system during a certain time period (i.e. 2 hours). The actual amount of the discrepancy depends on many factors such as packed line versus unpacked, line diameter, pumping rate, ambient temperature, etc.
- Pressure surges which exceed the system's maximum operating pressure. ***Pressure surges which exceed 110% of the maximum operating pressure are safety related conditions***. (see Section 5.7, Safety Related Conditions in the *Pipeline Operation and Maintenance Manual).*
- Flow and pressure relationships which may indicate a line blockage or leak as described in Section 4.1 "System Integrity of the *Pipeline Operation and Maintenance Manual*."

*SOC Operator Response Duties*

- Immediately investigate the cause of the abnormal condition. Confirm all associated valve alignments, meter readings, pressure readings, and other available information.
- Take corrective action as necessary to mitigate the effects of the abnormal condition.
- If a leak is suspected, shutdown the system and follow the emergency procedures described in Section C.
- If the conditions indicate a line blockage, shutdown the system and contact the appropriate maintenance personnel. Document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.
- After confirmation that the blockage has been removed, restart the line.

### Operation of a Safety Device

Tesoro pump stations are equipped with a variety of safety devices designed to prevent the pipeline systems from operating beyond design limits. These devices can be (generally) divided into three categories: ***station alarms, unit alarms and relief valves***.

The operation of any safety device indicates that the device is operating properly. The SOC Operator will review line operations and determine whether or not this condition meets the abnormal condition definition.

STATION ALARMS

Safety devices which monitor the operation of the pump station or terminal. These alarms (also called protective shutdown switches) include:

- high discharge pressure shutdown switch
- low suction pressure shutdown switch
- high-high level alarm
- lower explosive limit (LEL) or flame detector alarm

(b) (7)(F)

[redacted]

*SOC Operator Response Duties*

If a pump station shuts down on high discharge pressure:

- Determine the cause of the excessive pressure
- If the cause is obvious, such as a closed valve, correct the problem and re-start the station. Carefully monitor pressure and flow indications until the normal operations have been re-established. Resume normal system monitoring.
- If the cause(s) of the high pressure condition cannot be determined, ***DO NOT RE-START THE SYSTEM***. Contact the Pipeline Manager and/or appropriate maintenance personnel to investigate the cause(s) and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.

(b) (7)(F)

[redacted]

Low suction shutdowns are usually caused by lowered pressures resulting from changes in upstream operations such as unit shutdowns or loss of pressures due to an upstream line break or leak.

*SOC Operator Response Duties*

If a low-pressure shutdown occurs, determine the cause of the low pressure condition.

- If the shut-down was caused from normal upstream operations, the unit may be re-started. Continually monitor the line until the operation returns to steady state conditions. Resume normal system monitoring.
- ***Do NOT restart the pump if the cause of the low pressure condition cannot be determined.*** Contact the Team Leader and/or maintenance personnel to assist in determining the cause(s) of the shutdown and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.

(b) (7)(F) [redacted]

*SOC Operator Response Duties*

If a high-high level alarm is received for breakout or storage tankage:

- Immediately switch the stream into another tank, if available, and doing so will not result in product contamination; or
- Open the bypass valve to direct the stream around the tank (tightline), if the facility is so equipped, and isolate the tank; or
- Shutdown the applicable stations, and isolate the tank.
- As soon as practicable, contact the Pipeline Manager and/or appropriate terminal or maintenance personnel and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.

***A high-high level alarm for a sump tank which shuts the station down and transmits an alarm to*** (b) (7)(F) [redacted] ***constitutes an abnormal condition.***

In some cases, pipeline stations are equipped with sump tanks connected to the station's drain lines and the pump stuffing boxes to collect the normal seepage from the mechanical pump seals. The sump tanks (typically 3-5 bbl capacity) are equipped with level switches. A typical sump tank system consists of:

- (b) (7)(F) [redacted]
- [redacted]
- [redacted]

[redacted] *Operator Response Duties*

If a high-high level switch on a sump shuts the station down and transmits an alarm to the Control Center:

- Contact appropriate maintenance personnel to investigate and correct the condition and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.

(b) (7)(F) [redacted]

***should pumping continue at a facility which has alarmed a lower explosive limit or flame detection.***

*SOC Operator Response Duties*

If a LEL or flame detector alarm is received:

- Immediately shut down the facility
- As soon as practicable, contact the Pipeline Manager and/or appropriate terminal or maintenance personnel and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.

UNIT ALARMS

A typical pumping unit is equipped with various safety devices designed to shut the unit down on high temperature, seal failure, high vibration, and high case pressure conditions before equipment damage occurs. Only seal failure (due to environmental concerns) and high case pressure conditions meet the definition of an abnormal condition. If a particular reason for a unit shut down cannot be identified, then an abnormal condition does exist which needs to be referred to field maintenance personnel.

- Either a high case pressure alarm or seal failure alarm constitutes an abnormal condition. Contact appropriate maintenance personnel immediately to investigate and correct the problem and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.

*SOC Operator Response Duties*

If a unit alarm shuts a pumping unit down (neither high case pressure nor seal failure):

- If the alarm is remotely resettable, the reason for the shutdown is known, and does ***not*** present a potential hazard to safe operations, reset and restart the unit. No abnormal condition exists.
- If that particular unit is required for current operations and cannot be restarted and the reason for the shutdown is unknown, contact appropriate maintenance personnel immediately to investigate and correct the problem and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.
- If that particular unit is ***not*** needed to continue operations, the reason for the shutdown is unknown, but the situation does ***not*** present an immediate hazard, contact appropriate maintenance personnel during normal business hours to correct the problem and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.

RELIEF VALVES

(b) (7)(F)

[redacted]

(b) (7)(F)

[redacted]

*SOC Operator Response Duties*

When it has been determined that a relief valve has ***unintentionally*** opened:

- If the situation warrants, shut the system down.
- Immediately investigate the cause of the abnormal condition by confirming proper valve alignments, meter readings, pressure readings and any other available indications.
- Take whatever corrective action(s) necessary.
- Contact appropriate maintenance personnel to help with corrective action and/ or further investigate the condition and document the event by creating a Work Order for the field maintenance personnel to record their response and closure to the event.

**Failure of Operating Equipment which Could Result in an Emergency Condition**

An abnormal or emergency condition can result from the malfunction and/or failure of operating equipment which:

- jeopardizes the safe operation of the pipeline
- requires the indefinite shutdown of the pipeline
- could result in product contamination.
- ***The SOC Operator must notify the operating supervisor and/or appropriate maintenance personnel immediately*** and document the event by creating a Trouble Report for the field maintenance personnel to record their response and closure to the event.

**Personnel Error**

The potential for personnel error always exists. Greater job demands, system complexity, schedule pressures, and personal stress are a few of the many factors that can contribute to personnel error.

Abnormal Conditions Caused by Personnel Error - Personnel error that results in:

- unintentional shut down of the pipeline system and/or
- damage to equipment is considered an abnormal condition.

In order to assure these mistakes do not jeopardize the integrity of the pipeline system, the safety of other employees, the public or damage the environment, personnel errors must be reported to the Team Leader and/or appropriate maintenance personnel.

### 1.1.9 Certification

Tesoro Logistics Operations LLC certifies that it has obtained, through contract or other approved means, the necessary personnel and equipment to respond, to the maximum extent practicable, to a worst case discharge (b) (7)(F) [redacted] for the THPP Response Zone) or a substantial threat of such a discharge. Subsequent sections of the Tesoro Pipeline Response Plan demonstrate Tesoro's and their OSROs' capability to respond to this WCD. Response equipment is listed in Section 1.10., strategies for protection; containment and recovery are presented in Part II.

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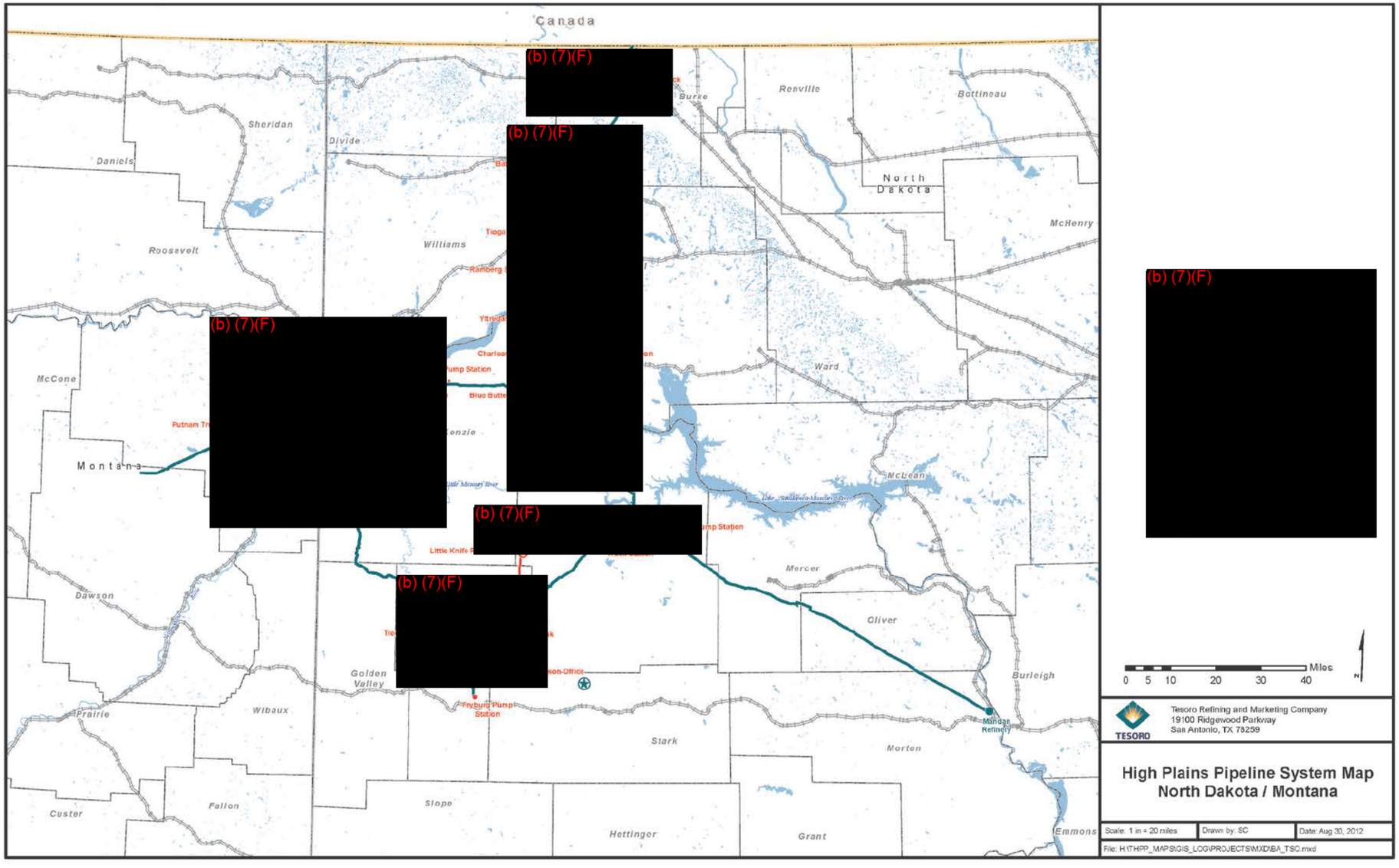
**FIGURE 1.1-1**
**THPP Gathering and Transmission System**



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## 1.10 RESPONSE RESOURCES

This section provides comprehensive and updated listings of the response equipment available for spill response operations. Implementation of the response strategies depends upon the availability of many types of services, equipment, and materials from private contractors, and local, state, and federal agencies, in addition to in-house resources. Tesoro is responsible for maintaining access to suitable equipment and sufficient manpower with requisite spill response knowledge and experience. Response resource planning calculations are shown in Table 1.10-1.

**Table 1.10-1**
**Worksheet to Plan Volume of Response Resources for Worst Case Discharge (WCD): Group II Oil**

**PART I** **BACKGROUND INFORMATION**

(b) (7)(F) [redacted] drainage and shutdown time)

Step (B) Oil Group: **II (Crude)**

Step (C) Operating Area: **Rivers and Canals**

Step (D) Percentages of Oil:

(D1 ) Lost to Natural Dissipation: **40%**
(D2) Recovered Floating Oil: **15%**
(D3) Oil Onshore **45%**

(b) (7)(F) [redacted]

Step (F) Emulsification Factor **1.8**

Step (G) On-Water Oil Recovery Resource Mobilization Factor

| (G1) - Tier 1 | (G2) - Tier 2 | (G3) - Tier 3 |
|---|---|---|

(b) (7)(F) [redacted]

**Part IV** **On-Water Response Capacity By Operating Area (1998 CAPS)**

| Tier 1 | Tier 2 | Tier 3 |
|---|---|---|
| **1,875** | **3,750** | **7,500** |

**Part V** **On-Water Amount Needed to be Identified but not Contracted for in Advance [Part II-Part IV]**

| Tier 1 | Tier 2 | Tier 3 |
|---|---|---|
| **2,221 bbls** | **1,712 bbls** | **692 bbls** |

## 1.10.1 Oil Spill Recovery Equipment

Tesoro has 20,740 barrels per day (bpd) of recovery equipment available through contracts or direct ownership. A breakdown of specific types, quantities, and de-rated recovery rates is presented in Table 1.10-2.

**Table 1.10-2. Oil Spill Recovery Equipment**

| Owner | Type | Qty | Total De-rated* Recovery (bpd) | Location & Response Time |
|---|---|---|---|---|
| Bay West | Elastec Drum Skimmer | 3 | 1,200 | St. Paul, MN-12hrs |
| Bay West | Manta Ray skimmer | 5 | 1,032 | St. Paul, MN-12hrs |
| Bay West | JBF DIP-400 skimmer | 1 | 1,083 | St. Paul, MN-12hrs |
| Bay West | 2” Air powered double diaphragm pump | 6 | 4,114 | St. Paul, MN-12hrs |
| Quali Tech | FOILEX TDS 200 weir skimmer | 1 | 2,114 | Chaska, MN-10 hrs |
| Quali Tech | FOILEX TDS 150 crane weir skimmer | 1 | 905 | Chaska, MN-10 hrs |
| Quali Tech | FOILEX Mini weir skimmer | 1 | 905 | Chaska, MN-10 hrs |
| Quali Tech | Lamour Minimax 30 Brush skimmer | 1 | 3,622 | Chaska, MN-10 hrs |
| Quali Tech | KLK 252 Drum skimmer | 1 | 603 | Chaska, MN-10 hrs |
| CEDA | 100 bbl Vacuum Truck | 1 | 60 | Mandan, ND-1hr |
| CEDA | 70 bbl Vacuum Truck | 2 | 84 | Mandan, ND-1hr |
| Tesoro Pipeline | Oil Mop Mark I14-VE rope skimmer 3M-373-1 with 200’ OCW-6 mop (1992 Haulmark Spill Trailer #2) | 1 | 320 | Sidney, MT-6 hrs |
| Tesoro Pipeline | 3” Gorman Rupp diaphragm pump w/gasoline engine (Office/Shop) | 1 | 2,688 | Sidney, MT-6hrs |
| Tesoro Mandan Refinery | 3” Double diaphragm pump w/ diesel engine (Spill Response Trailer) | 1 | 1,800 | Mandan, ND-1hr |
| Tesoro Mandan Refinery | Rope Mop skimmer w/ 200’ 4” mop (Spill Response Trailer # 23202) | 1 | 210 | Mandan, ND-1hr |
| **Total De-rated Recovery Capacity: 20,740 bpd** | | | | |

* De-rated recovery rates are based on 20% of standard rates

## 1.10.2 Containment Boom

Tesoro has 27,820 feet of containment boom available through contracts or direct ownership. A breakdown of specific types, and quantities is presented in Table 1.10-3.

**Table 1.10-3. Containment Boom**

| Owner | Type | Quantity | Length (Feet) | Location & Response Time |
|---|---|---|---|---|
| Bay West | Containment boom (Enclosed trailer) | 1 | 2,300 | St. Paul, MN-12 hrs |
| Bay West | Containment boom (Conex box) | 1 | 2,500 | St. Paul, MN-12 hrs |
| Bay West | Containment boom (Conex box - Wakota CAER) | 3 | 4,000 | St. Paul, MN-12 hrs |
| Bay West | Containment boom (Warehouse) | 1 | 2,000 | St. Paul, MN-12 hrs |
| QualiTech | Expandi 4300 air inflatable | 1 | 400 | Chaska, MN-10 hrs |
| QualiTech | Techniboom | 1 | 5,000 | Chaska, MN-10 hrs |
| Tesoro Pipeline | Fast water boom (1997 Road King Tandem axle utility 18' trailer) | 20 x 100' | 2,000 | Sidney, MT (Office/Shop) – 6hrs |
| Tesoro Pipeline | 7" O.K. Corral boom (16' Trailer #42798) | 6 x 100' | 600 | Watford City, ND-5 hrs |
| Tesoro Pipeline | 7" O.K. Corral boom (16' Trailer #42798) | 12 x 50' | 600 | Watford City, ND-5 hrs |
| Tesoro Pipeline | 7" O.K. Corral boom (16' Trailer #42797) | 14 x 100' | 1,400 | Watford City, ND (16' Trailer #42797)-5 hrs |
| Tesoro Pipeline | 7" O.K. Corral boom (16' Trailer #42797) | 8 x 40' | 320 | Watford City, ND-5 hrs |
| Tesoro Pipeline | 7" O.K. Corral boom (16' Trailer #42797) | 10 x 100' | 1,000 | Watford City, ND-5 hrs |
| Tesoro Pipeline | 7" O.K. Corral boom (18' Road King flatbed trailer) | 20 x 100' | 2,000 | Dickinson, ND (Office/Shop)-2 hrs |
| Tesoro Mandan Refinery | 4" Orange containment boom (Haulmark Spill Trailer) | 5 x 100' | 500 | Mandan, ND – Refinery-1 hr |
| Tesoro Mandan Refinery | 6" OK Corral boom (Spill Response Trailer # 23202) | 8 x 50' | 400 | Mandan, ND – Refinery-1 hr |
| Tesoro Mandan Refinery | 4" Orange (Spill Response Trailer # 23202) | 10 x 100' | 1,000 | Mandan, ND – Refinery-1 hr |
| Tesoro Mandan Refinery | Orange Mini boom (Spill Response Trailer # 23202) | 16 x 50' | 800 | Mandan, ND – Refinery-1 hr |
| Tesoro Mandan Refinery | 6" Orange containment boom (Spill Response Trailer) | 10 x 100' | 1,000 | Mandan, ND – Refinery-1 hr |
| **Total Containment Boom: 27,820 Feet** | | | | |

## 1.10.3 Temporary Storage Capacity

Tesoro has 116,867 bbls of temporary storage capacity available through contracts or direct ownership. A breakdown of specific types, and quantities is presented in Table 1.10-4.

**Table 1.10-4. Temporary Storage Capacity**

| Owner | Type | Capacity (bbls) | Location & Response Time |
|---|---|---|---|
| Bay West | Ashland Refinery (F) | 5,952 | St. Paul, MN-12 hrs |
| Bay West | Wayne Transport (P)(T) | 13,714 | Rosemount, MN-12 hrs |
| Quali Tech | TSB (P) | 500 | Chaska, MN-10 hrs |
| Quali Tech | Fast Tank- 3 each (P) | 180 | Chaska, MN-10 hrs |
| CEDA | Tanker Truck (P)(T) | 143 | Mandan, ND-1 hr |
| CEDA | Vacuum Trucks- 3 each (P)(T) | 240 | Mandan, ND-1 hr |
| Tesoro Pipeline | 1000 gallon FDT portable tank (1992 Haulmark Spill Trailer #2)-(P) | 24 | Sidney, MT-6 hrs |
| Tesoro Mandan Refinery | 2,400 gallon Fast Tank- 2 each (Spill Response Trailer) (P) | 114 | Mandan, ND-1hr |
| Tesoro Mandan Refinery | Refinery Tankage (F) | 96,000 | Mandan, ND-1hr |
| **Total Temporary Storage Capacity: 116,867 bbls** | | | |

(P) = Portable Storage
(F) = Fixed Storage
(T) = Transportation Capable

## 1.10.4 Communications Equipment

Tesoro has a variety of communications equipment available through contracts or direct ownership. A breakdown of specific types, and quantities is presented in Table 1.10-5.

**Table 1.10-5. Communications Equipment**

| Owner | Type | Quantity | Location & Response Time |
|---|---|---|---|
| Bay West | Two-way radio | 8 | St. Paul, MN-10 hrs |
| Bay West | Boat mounted radio | 2 | St. Paul, MN-10 hrs |
| Bay West | Cellular Telephone | 12 | St. Paul, MN-10 hrs |
| Bay West | Pager | 1 | St. Paul, MN-10 hrs |
| Tesoro Pipeline | Mitusbishi SZ300A satellite radio telephone | 25 | Various locations along the Pipeline–0.5 hrs |
| **Total Communications Equipment: 48 Units** | | | |

## 1.10.5 Tesoro-Owned Equipment Inspection and Maintenance

Tesoro-owned spill response equipment is housed in separate spill trailers and can be accessed by the pipeline response personnel. To ensure operational readiness, the equipment is

thoroughly inspected during the semi-annual deployment exercises with a final year-end inspection. Inspection and maintenance activities are conducted in accordance with the National Preparedness for Response Exercise Program (NPREP) guidelines and applicable regulations. A copy of the spill response equipment inspection checklists (including status report for each piece of equipment) is presented in Figures 1.10-1 through 1.10-11.

**Figure 1.10-1**
**Haulmark "Boom Vane" Spill Trailer - #600**
**(Status Report)**

**Latest Revision Date: 3/14/05**

**Location:** South Fire Station **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement
(Identify W.O. # for repair work or PO # for purchases)

| Description | Quantity | Status |
|---|---|---|
| Boom vane Assembly<br>• Orange float<br>• Main body and stabilizer arms<br>• Handle<br>• Stabilizer wing<br>• Bridle kit<br>• Mooring line (12mm dynema)<br>• Control line (4 mm trim line) | <br>1<br>1<br>1<br>1<br>1<br>300 feet<br>300 feet | |
| Orange containment booms (4 x 4) | 4-100' sections | |
| Post driver | 1 | |
| Post puller | 1 | |
| Bolt cutter | 1 | |
| | | |
| Fence posts (orange) | 10 | |
| 55 gallon drum | 1 | |
| Fire extinguishers (5 lb. ABC) | 1 | |
| Personal Protective Equipment<br>• Chest waders w/suspenders<br>• Life vests | <br>4 pair (9, 10, 11, and 13)<br>14 | |
| Miscellaneous items<br>• Boom bridles for 4 x 4 boom<br>• Clevises | <br>4<br>½"-2; 5/8"-2; ¾"-2 | |

## Figure 1.10-2
## Spill Response Trailer #23202
## (Status Report)

**Latest Revision Date: 3/14/05**

**Location:** Fire Field **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement (Identify W.O. # for repair work or PO # for purchases)

| Description | Quantity | Status |
|---|---|---|
| O.K. Corral Containment boom – 6 x 6" | 8 – 50' sections (400 feet) | |
| Orange Containment boom – 4 x 4" | 10 – 100' sections (1000 feet) | |
| Boom bridles for 6"x6" boom | 6 | |
| Orange Mini booms | 16 – 50' sections (800 feet) | |
| Mini-boom connector plates | 14 | |
| Mini-boom bridles | 2 | |
| 3-1/4" boom pins | 23 | |
| 3M Sorbent pads – Type 156 (17"x19") | 100 pieces | |
| CONWEB Sorbent pads (17"x17-1/2") | 2 bags (100 pieces ea) | |
| 3M Sorbent pillows – Type 240 | 30 | |
| Absorbent rope booms | 2-10' lengths | |
| Polyethylene sheeting | 1 roll (32' x 100') | |
| 300 Gallon galvanized trough | 1 | |
| Static storage tank (1500 gallon) | 1 | |
| Manta ray skimmer head floats | 7 | |
| Heavy duty hand wringer | 2 | |
| Chicken wire (4' width) | 1 roll | |
| Funnels | 2 | |
| Poly-foam floats (orange) | 2 | |
| 55 gallon drum | 1 | |
| 1 pint sample bottles | 24 | |
| Rags | 1 box | |
| Rope Mop Skimmer system | 1 | |
| • Explosion-Proof driver | 1 | |
| • Skimmer head mounting pan | 1 | |
| • Floatation tail pulleys | 2 | |
| • Trough | 1 | |
| • 4" Rope mop | 200 feet | |

**Figure 1.10-3**
**Spill Response Trailer #602**
**(Status Report)**

**Latest Revision Date: 3/14/05**

**Location:** North Fire Station **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement
(Identify W.O. # for repair work or PO # for purchases)

| Description | Quantity | Status |
|---|---|---|
| Orange containment boom – 6"x 4" | 10 – 100' sections (1000' total) | |
| Boom tow bridles for 6" x 4" boom | 20 | |
| Diesel 3" diaphragm pump | 1 | |
| 3" suction hose (for diaphragm pump) | 100 feet | |
| 3" discharge hose (for diaphragm pump) | 150 feet | |
| Manta ray skimmer head | 1 | |
| Manat ray skimmer head floats | 2 | |
| 2400 gallon fast tanks | 2 | |
| Sorbent spaghetti boom (5" diameter) | 2 bags (4-10' sections/bag) | |
| Sorbent pads (17"x17") | 2 bags | |
| Viscus sweep (snare on a rope) | | |
| Fire extinguishers (5 lb. ABC) | 1 | |

**Figure 1.10-4**
**Field ICP – Interstate Spill Response Trailer - #603**
**(Status Report)**

**Latest Revision Date: 3/14/05**

**Location:** South Fire Station **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement
(Identify W.O. # for repair work or PO # for purchases)

| Description | Quantity | Status |
|---|---|---|
| Big Shot (line-throwers) w/pouch | 2 | A |
| Sorbent spaghetti booms (5" diameter) | 5 boxes of 4-10' sections | A |
| Sorbent booms (8" diameter) | 1 bag | A |
| Viscus Sweep (Snare on a rope) | 4 - 30# boxes | A |
| Floats (bouys) | 6 | A |
| 40 lb. Danforth anchor | 4 | A |
| 14 lb. Danforth anchor | 2 | A |
| 9 lb. Danforth anchor | 1 | A |
| Coleman Powermate 3750w generator | 1 | A |
| Anchor arrangements (in buckets) | 10 sets | A |
| – 27' ¾" polypropylene rope | 2 | |
| – 50' ¾" polypropylene rope | 4 | |
| – 68' ¾ " polypropylene rope | 2 | |
| – 80' ¾" polypropylene rope | 1 | |
| – 100' ¾" polypropylene rope | 1 | |
| ½" nylon rope (on reel) | 500' | A |
| 5/8" polypropylene rope (on spool) | 150' | A |
| 5/8" polypropylene rope (on green roller) | 150' | A |
| 5/8" polypropylene rope (on spool) | 300' | A |
| ½" polypropylene rope | 35' | A |
| Traffic cones (36" high) | 4 | A |
| Elastol Emulsifier | 1 - 25# pail | A |
| Post driver | 1 | A |
| Post puller | 1 | A |
| Shovel spades/rakes | 4 | A |
| Flat shovel | 4 | A |
| Pitch forks | 2 | A |
| Ice chopper | 1 | A |
| Fence posts (6 footers) | 26 | A |
| 30 gallon galvanized garbage cans | 1 | A |
| 55 gallon drum | 1 | A |
| Garbage bags (38: x 58: - 2 mil) | 1 box – 100 count | A |
| 16 Quart galvanized buckets | 3 | A |
| Fire extinguishers (5 lb. ABC) | 1 | A |
| Rags | 1 garbage can | A |

**Figure 1.10-4 (Cont.d)**
**Field ICP – Interstate Spill Response Trailer - #603**
**(Status Report)**

| | | |
|---|---|---|
| Personal Protective Equipment<br>• Chest waders w/suspenders<br>• BEST Rubber type gloves (#10)<br>• Hip boots<br>• Hazmat disposable boots<br>• Tyvek suits<br>• Rain suits (rubber) | 5 pair (8, 9, 10, 11, and 13)<br>32 pair<br>7 pair (9, 10, 3-11's, and2-12)<br>3 dozen (XL)<br>3 boxes (25-XL; 25-XXL, 25-XXXL)<br>2-Lg jackets; 1-XLg set; 2-Lg sets) | A<br>A<br>A<br>A<br>A<br>A |
| Miscellaneous items<br>• Boom bridles for 4 x 4 boom<br>• Boat tow harness (Taperflex)<br>• Clevises | 10<br>1<br>3/8"-5; ½"-5; 7/16"-5; 9-5/8"; ¾"-5 | A<br>A<br>A |
| Miscellaneous items – Cont.<br>• Links<br>• FIRELINE – "Do Not Cross" tape<br>• Tire pump<br>• First Aid Kit<br>• Tool box<br>• Plastic (20' x 100') 6 mil<br>• Mor-roll PRF (30' x 150")<br>• 100' – ¼" cotton sash cord<br>• 100' – 3/8" cotton sash cord<br>• Stream light Rechargeable Flashlight | 12<br>1box<br>1<br>1<br>1<br>1 roll<br>2 boxes<br>2<br>2<br>1 | A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A<br>A |

## Figure 1.10-5
## 1981 Wells Spill Trailer #1 (Status Report)

### CRUDE PIPELINE EQUIPMENT INVENTORY
### (Status Report)

Latest Revision Date: 1/19/04

**Location:** *Sidney, MT (1981 Wells Spill Trailer #1)* **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement

| Description | Quantity | Status |
|---|---|---|
| Red absorbent booms | 4 bags, 10' sections | |
| Yellow absorbent booms | 2 bags, 10 sections | |
| Absorbent pads | 4 boxes, 24 x 24 | |
| Floating skimmer | 1 | |
| Floating pump | 1 | |
| All purpose gas-powered winch | 1 | |
| Light and stand with outlets | 1 | |
| Flood type lamps | 2 | |
| Emergency flash lights with red lens | 2 | |
| Emergency flash lights with yellow lens | 5 | |
| 100' rope without loops | 6 | |
| 200' rope without loops | 4 | |
| 200' rope with loops | 1 | |
| 500' of 3/8" yellow rope | 1 | |
| 5/8" x 600'of rope | 7 rolls | |
| Flashlight, water and hazard proof | 1 | |
| Lifting harness | 1 | |
| Fire extinguisher, 20lb | 1 | |
| First Aid kit | 1 | |
| Multi-purpose anchor | 1 | |
| Megaphones | 2 | |
| Towing mirrors, temporary | 1 set | |
| Long handled axe | 1 | |
| Float-type ramps | 1 set | |
| Extension cord, 10' with 4 GFCI outlets | 1 set | |
| Pipe, 1" x 3' | 10 | |
| Stakes, 3/8" rebar | 40 | |
| "Authorized Personnel Only" tape | 2 rolls | |
| Signal flags | 8 | |
| "Men Working" signs | 2 | |
| Fire extinguishers (5 lb. ABC) | 2 | |
| Rags | 50 | |
| Personal Protective Equipment<br>• Hip boots<br>• Wet suit, large<br>• Life vests/pillow<br>• Flag vests | <br>6 pair (assorted sizes)<br>1<br>4/2<br>2 | |
| 12" electric exhaust fan | 1 | |
| Wash down pump, 3 hp | 1 | |
| Honda Model EG-1500 generator | 1 | |
| Shovels, spade | 4 | |
| Pitch forks | 2 | |
| Rakes | 2 | |
| Mops | 4 | |
| Hose | assortment | |

Distribution: Return completed copy to the refinery CERC to be maintained on file for a period of 5-years.

**Figure 1.10-6**
**1992 Haulmark Spill Trailer #2 (Status Report)**

**CRUDE PIPELINE EQUIPMENT INVENTORY**
**(Status Report)**

Latest Revision Date: 1/19/04

**Location:** *Sidney, MT (1992 Haulmark Spill Trailer #2)* **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement

| Description | Quantity | Status |
|---|---|---|
| Oil Mop Mark I14-VE rope skimmer 3M-373-1 with 200' OCW-6 mop | 1 | |
| Tpn 16 tail pulleys for mop | 2 | |
| Acme FS150A floating saucer wash down pump #42793 | 1 | |
| 1000 W metal halide lamp with stand and cord | 2 | |
| Heavy debris 38" x 50" bags | 2 rolls | |
| 1000 gallon FDT portable tank, 8' x 8' x 28" | 1 | |

**Location:** *Sidney, MT (Office/Shop)* **Inspector**: _____ **Date:** _____

| Description | Quantity | Status |
|---|---|---|
| 1997 Road King Tandem axle utility 18' trailer with fast water boom | 20-100' sections | |
| 1997 Alaskan Lund 21' boat with 75 hp outboard motor with Shore Lander trailer | 1 | |
| 3" Gorman Rupp diaphragm pump w/gasoline engine | 1 | |

Distribution: Return completed copy to the refinery CERC to be maintained on file for a period of 5-years.

## Figure 1.10-7
## 16' Trailer #42798 (Status Report)

### CRUDE PIPELINE EQUIPMENT INVENTORY
### (Status Report)

Latest Revision Date: 1/19/04

**Location:** *Watford City, ND (16' Trailer #42798)* **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement

| Description | Quantity | Status |
|---|---|---|
| O.K. corral booms with 7" diameter flotation and 9"skirt, 3/8" chain, top cable, and quick latch couplers | 6 – 100' sections | |
| O.K. corral booms with 7" diameter flotation and 9"skirt | 12 – 50' sections | |
| 40 lb. Danforth anchor | 4 | |
| 14 lb. Danforth anchor | 2 | |
| 9 lb. Danforth anchor | 1 | |
| Hard shell Mooring buoy | 4 | |
| Quick latch towing bridle w/8' of ½" poly rope | 1 | |
| 30 lb. fire extinguisher | 1 | |
| Fire and First Aid blanket | 1 | |
| Safety master 24 unit First Aid kit | 1 | |
| Life vests (medium and large/X-large) | 1/1 | |
| Tyvek coveralls | | |
| • Large | 25 | |
| • X-Large | 25 | |
| Raingear (coverall and jackets) | | |
| • Small | 1 | |
| • Medium | 1 | |
| • Large | 3 | |
| • X-Large | 2 | |
| Edmont SOL-VEX Nitrile gloves | | |
| • Size, 7-7 ½ | 12 pair | |
| • Size, 9-9 ½ | 20 pair | |
| • Size 11 | 12 pair | |
| Tingley steel toe hip boots | | |
| • Size 9 | 2 pair | |
| • Size 10 | 2 pair | |
| • Size 11 | 1 pair | |
| • Size 12 | 1 pair | |
| Miscellaneous Tools | | |
| • Pitch Forks | 4 | |
| • Shovels | 5 | |
| • Rakes | 2 | |
| • Fence posts | 11 | |
| • 12 lb sledge hammer | 1 | |
| • Soldering gun | 2 | |
| • Wire splicing kit w/misc connections | 1 | |
| • Tool box with extra tools | 1 | |
| • Surge outlet strip | 1 | |
| • Manual air pump | 1 | |
| Honda 3500 Watt generator | 1 | |
| Portable flood lights | | |
| • 1000 Watt | 2 | |
| • 500 Watt | 2 | |
| Cyalume 20-minute safety light | 12 | |
| Cyalume 2-hour safety light | 22 | |

**Figure 1.10-7 (cont.)**
**16' Trailer #42798 (Status Report)**

**CRUDE PIPELINE EQUIPMENT INVENTORY**
**(Status Report)**

Latest Revision Date: 1/19/04

**Location:** *Watford City, ND (16' Trailer #42798)* **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement

| Description | Quantity | Status |
|---|---|---|
| High Pressure wash down pump package | | |
| • Honda pump, Model WH20X (132 GPM flow rate) | 1 | |
| • 2A quick coupler adapter (1-intake; 1- discharge) | 2 | |
| • 2 x 1-1/2" reducer coupler discharge adapter | 1 | |
| • 2C quick coupler (adapts intake strainer to intake hose using a short section of 2: hose) | 1 | |
| • 2" suction hose w/quick couplers | 1 – 10' section | |
| • 1-1/2" discharge hose w/quick coupler | 1 – 10' section | |
| • Tapered nozzle with quick coupler | 2 | |
| • 1-1/2 and 2" quick coupler rubber gaskets (spares) | 2 | |
| Floating wash down pump, with 25' of 1-1/2" hose with quick couplers spray nozzle; 15' section of 1-1/2" suction type hose with PT coupler, and 10' section of 1-1/2" suction type hose with PT couplers | 1 | |
| 5/8" Polypropylene rope | | |
| • 30' with hooks | 3 | |
| • 50' with chain and hooks | 3 | |
| • 60' with hooks | 2 | |
| • 100' with hooks | 1 | |
| • 150' with chain and hooks | 2 | |
| • 150' on spools with hooks | 2 | |
| • 600' on spool | 1 | |
| Acme oil sorbent booms | | |
| • 10' sections | 1 | |
| • 20' sections | 5 | |
| Flashlight | 1 | |
| 6" snatch block | 1 | |
| Binoculars, 8x40 | 1 | |
| Cloth rags | 1 box | |
| Hand soap | 2 bottles | |
| Fence post driver | 1 | |
| Inflatable buoy, white | 4 | |
| Inflatable buoy, red | 2 | |
| 6 amp battery charger | 1 | |
| 1-1/2 ton lever hoist | 1 | |
| 32 gallon garbage cans | 2 | |
| 2-1/2 gallon gas can | 1 | |
| Cooler | 1 | |
| Generator cords | 3 | |
| 29 amp connector | 1 – 50' section | |
| 14.5 amp connector | 2 – 50' section | |
| Extension cord | 1 – 25' section | |

**Figure 1.10-7 (cont.)**
**16' Trailer #42798 (Status Report)**

**CRUDE PIPELINE EQUIPMENT INVENTORY**
**(Status Report)**

Latest Revision Date: 1/19/04

**Location:** *Watford City, ND (16' Trailer #42798)* **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement

| Description | Quantity | Status |
|---|---|---|
| 10-W30 motor oil | 1 case | |
| Outboard motor oil | 1 gallon | |
| Hard hats | 2 | |
| Plastic fence 4'x100' | 1 section | |
| 3 gallon water dispenser | 1 | |
| T-190 oil sorbent (19'Wx144'L) | 1 roll | |
| 24" bolt cutter | 1 | |
| Half mask rubber cartridge respirator<br>• Large<br>• Medium | <br>1<br>3 | |
| Half mask cartridges | 3 sets | |
| Weed sprayers | 6 | |

**Figure 1.10-8**
**16' Trailer #42797 (Status Report)**

## CRUDE PIPELINE EQUIPMENT INVENTORY
## (Status Report)

**Location:** *Watford City, ND (16' Trailer #42797)* **Inspector:** _____ **Date:** _____

| Description | Quantity | Status |
|---|---|---|
| O.K. corral booms with 7" diameter flotation and 9"skirt, 3/8" chain, top cable, and quick latch couplers | 14 – 100' sections | |
| O.K. corral booms with 7" diameter flotation and 9"skirt, 3/8" chain, top cable, and quick latch couplers | 8 – 40' sections | |
| O.K. corral booms with 7" diameter flotation and 9"skirt, 3/8" chain, top cable, and quick latch couplers | 10 – 100 sections | |
| Quick latch towing bridles w/8' of ½" poly rope | 4 | |
| 30 lb. fire extinguisher | 1 | |

**Figure 1.10-9**
**Watford City Office/Shop (Status Report)**

## CRUDE PIPELINE EQUIPMENT INVENTORY
## (Status Report)

**Location:** Watford City, ND (Office/Shop) **Inspector:** _____ **Date:** _____

| Description | Quantity | Status |
|---|---|---|
| Honda WH20X High Pressure Wash down pump | 1 | |
| Honda 3500 Watt Generator (Eng #1425316) | 1 | |
| Alaskan Lund 20' boat with 112 HP OMC | 1 | |

Distribution: Return completed copy to the refinery CERC to be maintained on file for a period of 5-years.

**Figure 1.10-10**
**Tioga Office/Shop (Status Report)**

## CRUDE PIPELINE EQUIPMENT INVENTORY
## (Status Report)

Latest Revision Date: 1/19/04

**Location:** *Tioga, ND (Office/Shop)* **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement

| Description | Quantity | Status |
|---|---|---|
| Crestliner 16' boat with 60 HP Yamaha rear tiller motor (Serial #'s 550350 and 33076) | 1 | |

Distribution: Return completed copy to the refinery CERC to be maintained on file for a period of 5-years

**Figure 1.10-11**
**Dickinson Office/Shop (Status Report)**

## CRUDE PIPELINE EQUIPMENT INVENTORY
## (Status Report)

Latest Revision Date: 1/19/04

**Location:** *Dickinson, ND (Office/Shop)* **Inspector:** _____ **Date:** _____

**Legend:**
A) Equipment "in place" and in good working order
B) Equipment "in service" and in good working order (Identify location)
C) Equipment "out-of-service" and in need of repair or replacement

| Description | Quantity | Status |
|---|---|---|
| Alaskan Lund 20' boat with 75 HP Mercury motor | 1 | |
| 18' Road King flatbed trailer with O.K. corral boom (7" diameter flotation x 9" skirt) | 20 – 100 sections | |

Distribution: Return completed copy to the refinery CERC to be maintained on file for a period of 5-years.

## 1.10.6 Contracted Oil Spill Response Equipment

OSRO equipment lists and contracts are provided in Figures 1.10-11 through 1.10-14. OSROs are responsible for inspecting and maintaining their equipment in accordance with applicable requirements. Semiannual equipment deployment drills will be conducted as required by the *National Preparedness for Response Exercise Program (NPREP) Guidelines* (G.P.O.: 1994 O381-595 QL 3). OSROs will provide documentation of their drills to Tesoro upon completion.

**Figure 1.10-12**
**Bay West Equipment List**

Bay West

# Oil Spill Removal Organization Equipment List

EQUIPMENT TRAILERS
- 2 Equipment Spill Response Trailers

CONTAINMENT BOOM
- 1 Enclosed trailer with 2300' containment boom
- 1 Conex box with 2500' of containment boom
- 3 Conex boxes with a total of 4000' of containment boom (accessible through Wakota CAER)
- 1 St. Paul warehouse with 2000' of containment boom

MARINE
- 1 22' Sea Ark Boom deployment boat w/twin 70 hp Johnson motors
- 1 18' Sea Ark Boom deployment boat w/twin 60 hp Mercury motors
- 2 18' Lund Jon boats with 50 hp Mercury outboard motors w/Trailers
- 1 14' Alumacraft Jon Boat with 15 hp outboard motor
- 25 Life Jackets
- 9 1/2" x 600' rolls of Poly Rope
- 16 22 lb. Danforth type Anchors
- 18 Mooring Balls
- 7 1500 gal. Elastec Tanks
- 6 Air Powered Double Diaphragm Pumps-2"
- 1 Trailer Leroy Air Compressor
- 4 12 hp Emglo Air Compressors
- 1 8 hp Emglo Air Compressors
- 20 50' Suction hoses 2"
- 20 50' x 3/4" Air Hoses
- 20 50' x 3/8" Air Hoses
- 8 Portable Radios
- 3 Elastec Skimmers
- 5 Manta Ray Skimmers
- 1 JBF DIP-400 Skimmer
- 1 Hydraulic JBF Powerpack
- 80 5' Fence Posts for Boom
- 10 Chest Waders

SORBENTS
- 20 Bales T-270 8" x 10' (4 ea.) sorbent booms
- 20 Bales T-280 8" x 10' (4 ea) double boom
- 25 Bales T-126 17" x 100' Sweep
- 40 Bales T-151 17" x 19" Sorbent Pads
- 60 Cases P110 Universal Sorbent Pads
- 80 50 lb. Bags Floor Dry
- 60 Bags of Drizorb

CONTAINERS
- 35 55 gallon Open-top Poly Barrels
- 30 5 gallon Open-top Pails
- 300 6 mil Large Plastic Bags
- 20 Rolls 24' x 100' 6-mil Plastic
- 30 55 gallon Steel Open-top Barrel

PROTECTIVE GEAR
- 100 Sealed Seam Saranex Suits
- 100 Regular Saranex Suits
- 30 Rain Suits
- 400 Pair Nitrile Gloves
- 500 Pair Surgical Gloves
- 30 Hardhats w/Shields
- 30 Encon Safety Glasses

TOOLS
- 6 Safety Gas Can for Compressors
- 5 General Purpose Tool Boxes
- 10 Long-handle Square-point Shovels
- 10 Long-handle Round-point Shovels
- 6 Non-metallic Scoop Shovels
- 1 8" Rubber Squeegees
- 8 16" Flat Rakes
- 12 18" Street Brooms
- 6 Pitchforks
- 4 12' x 1¾" Pike Poles
- 4 650-watt Generators w/light
- 1 Homelite Generator 1500W
- 1 5500W Multiquip Generator
- 2 Exhaust Fans
- 16 12-3 50' Extension Cord
- 4 #2 Premoistened Plug & Patch Kits
- 20 Explosion-proof Flashlights
- 20 Extra Batteries
- 20 Paint Pens
- 80 Duct Tape Rolls
- Monitoring Equipment (PID, CGI, Draeger tubes)

SAFETY
- 8 SCBA
- 10 Supplied Airline Respirators
- 45 Full Face Respirators with Cartridges
- 10 Caution Tape 1000' Rolls
- 15 NIOSH Pocket Guide to Hazardous Chemicals
- 10 Grounding Straps for Barrels
- 6 Grounding Rod for Straps
- 3 Eyewash Stations
- 5 First Aid Stations
- 10 20 lb. Fire Extinguishers
- 10 Traffic Vests
- 2 Washing Equipment
- 8 Full Body Harnesses
- 8 25' Lanyards

HEAVY EQUIPMENT
- 1 Melroe Bob

*Bay West, Inc.* *www.baywest.com* *Updated 11/03*

**Figure 1.10-13**
**Bay West Agreement**

**Bay West**

*Delivering Environmental, Industrial, Marine, and Emergency Solutions*

*Bay West, Inc. • 24 Hours: 1-800-279-0456 • www.baywest.com*
5 Empire Drive, St. Paul, MN 55103 • 651/291-0456 • FAX 651/291-0099
10620 Widmer Rd., Lenexa, KS 66215 • 913/663-2915 • FAX 913/663-3067

**AGREEMENT FOR EMERGENCY SPILL RESPONSE SERVICES UNDER THE OIL POLLUTION ACT OF 1990 (OPA 90)**

This agreement for emergency spill response services is made and entered into this 22nd day of August 2001, by and between TESORO West Coast Co. (TESORO), a West Coast Company with offices at 300 Concord Plaza Drive, San Antonio, Texas 78216-6999 and Bay West, Inc. (Bay West), a Minnesota corporation with principal offices at 5 Empire Drive, St. Paul, Minnesota 55103.

WHEREAS, the Oil Pollution Act of 1990 (OPA 90) requires that companies with certain levels of petroleum products and proximity to navigable waters complete and submit spill preparedness plans and demonstrate that they have the equipment and personnel in place to respond to a worst case discharge, and

WHEREAS, Bay West is certified as an oil spill removal organization (OSRO) which, pursuant to OPA 90 and the federal regulations promulgated thereunder may provide by contract the equipment and personnel necessary for a company to respond for a worst case discharge, and,

WHEREAS, Bay West is experienced and specializes in planning for and responding to spills of both petroleum-based products and other types of hazardous materials and is willing to provide such services as an OSRO under OPA 90 to companies to which OPA 90 is applicable, and,

WHEREAS, TESORO is a company to which OPA 90 is applicable.

NOW THEREFORE, Bay West and TESORO agree as follows for the obtaining and providing of emergency spill response services:

**TESORO's OBLIGATIONS**

1. TESORO agrees to pay an annual participation fee based on a calendar year which is used to pay for the selection and training of personnel, management, and the performance of equipment maintenance for the calendar year. For the year of 2001, the annual participation fee will be $5,000 (prorated) and is due and payable upon execution of this agreement. For years after 2001, the annual participation fee will be $15,000 and shall be billed and is payable on November 1 preceding the next calendar year of the agreement. The annual participation fee for years subsequent to 2001 may be adjusted to reflect changes in Bay West's costs.

2. TESORO shall pay for emergency spill response services requested of Bay West pursuant to a fee schedule attached hereto. TESORO shall pay for drill services requested beyond that of Bay West's normal OSRO drilling schedule.

**Figure 1.10-13 (Cont.)**
**Bay West Agreement**

3. TESORO agrees to pay for the repair or replacement of equipment and for all consumables utilized on behalf of TESORO in connection with an emergency spill response or drill such as sorbents, fuel and other expendables.

**BAY WEST'S OBLIGATIONS**

4. Bay West will respond to any request of TESORO for the providing of emergency spill response services or drills in a manner consistent with the degree of promptness, skill and care expected of a company meeting the requirement of OPA 90. Bay West will provide such emergency spill response services or response to drills only when requested by TESORO whether such requests are oral or in writing. It is understood that oral requests shall be confirmed in writing as soon as reasonably possible.

5. Bay West shall replace consumables expended on behalf of TESORO or other participants hereunder as such consumables are used and the responsible party will be billed.

6. Bay West will respond to any request for emergency spill response services by TESORO, whether or not such request is covered by the provisions of OPA 90.

7. Bay West reserves to itself in its sole discretion the right to enter into similar agreements with other companies to which OPA 90 is applicable, it being understood that such other companies will be required to pay an entry participation fee and/or an annual fee to defray personnel and maintenance costs of Bay West.

**GENERAL PROVISIONS**

8a. Bay West agrees to indemnify and hold harmless TESORO and its officers, directors, employees and agents from and against any and all losses, damages, claims, liabilities, costs, and expenses, including legal fees and costs of investigation, resulting from or arising out of (a) the failure of Bay West to comply in all material respects with federal, state, and local laws, regulations, and ordinances applicable to the services undertaken by Bay West, (b) a material breach by Bay West of any term or provision of this Agreement, or (c) any negligent act or omission of Bay West or its agents, employees, or subcontractors in the performance of this Agreement.

8b. TESORO agrees to indemnify and hold harmless Bay West and its officers, directors, employees, and agents, from and against any and all losses, damages, claims, liabilities, costs, and expenses, including legal fees and costs of investigation, resulting from or arising out of (a) the negligence or willful misconduct of TESORO or (b) the material breach by TESORO of any term or provision of this Agreement.

9a. TESORO shall treat as confidential, information and data furnished to TESORO in connection with this Agreement by Bay West marked "Confidential" that relate to Bay West's technology, formulas, procedures, processes, inventions, and computer programs. TESORO shall not disclose the confidential information to any unaffiliated third party.

**Figure 1.10-13 (Cont.)**
**Bay West Agreement**

9b. In the course of performing services under this Agreement, TESORO may disclose to Bay West, or Bay West may otherwise acquire, business or technical information TESORO considers confidential or proprietary. Bay West will maintain in confidence all such information and will not disclose the information to others. Bay West will further maintain in confidence the details of the work it is performing for TESORO, specifically including the type of service being performed and the materials being handled, except as otherwise required by law or waived in writing by TESORO. Bay West will not use any of the above information for any purpose other than the performance of services for TESORO. Upon TESORO's request, Bay West shall return all reports, drawings, plans and other documentation furnished to Bay West by TESORO, and any copies thereof. Bay West may, however, retain one copy of any document prepared by or furnished to Bay West in connection with the performance of service under this Agreement in the files of its legal department for record purposes only.

9c. Nothing contained in this Agreement shall prevent either TESORO or Bay West from disclosing to others or using in any manner information which (a) was known to the receiving party before disclosure by the other party, (b) is part of the public domain or becomes part of the public domain through no act or omission of the receiving party, or (c) has been or is furnished to the receiving party by a third party, other than one acting directly or indirectly for or on behalf of TESORO or Bay West, who is not under an obligation of confidentiality to the disclosing party.

9d. In the event either party is required by a court or governmental authority to disclose any information received from the other party that is deemed by this Agreement to be confidential, the receiving party shall give prompt written notice to the other party, if possible, and allow the other party the opportunity to resist the disclosure.

9e. The obligations imposed under this Section shall expire ten (10) years after receipt of the confidential information.

10a. Neither party shall be deemed in breach of this Agreement to the extent that a delay or failure in the performance of its obligations results from any cause beyond its reasonable control. Such causes include acts of God, war, riot, fire, explosion, accident, adverse weather conditions, strikes, lack of adequate supplies or transportation, and acts of governmental authorities.

10b. The party asserting a right to suspend performance under this Agreement due to a force majeure cause shall promptly notify the other party of the cause, the performance suspended, and the anticipated duration of the suspension.

10c. Upon receipt of the notice set forth in Section 10b, the non-affected party may elect to (a) terminate the affected service or any part thereof or (b) suspend the affected service or any part thereof for the duration of the force majeure condition. In the latter event, performance shall be resumed once the force majeure condition ceases. Unless written notice is given by the non-affected party within thirty (30) days after being notified of the force majeure condition, the party shall be deemed to have elected option b. In the event the non-affected party

**Figure 1.10-13(Cont.)**
**Bay West Agreement**

chooses or is deemed to have chosen option b, it may at any time thereafter terminate the affected service or any part thereof upon fifteen (15) days' notice.

11. Bay West recognizes that TESORO may utilize the environmental services of third parties. Nothing contained in this Agreement shall require TESORO to solely utilize Bay West's services or to ever utilize Bay West's services.

12. Any notice required to be given by this Agreement shall be delivered personally or mailed by first class mail, postage prepaid, to the following address:

To: TESORO West Coast Co.
300 Concord Plaza Drive
San Antonio, TX 78216-6999
Attn: Eric Haugstad
Phone: 210-283-2636

To: Bay West, Inc. 5 Empire Drive
St. Paul, Minnesota 55103
Attn: Don Erickson
Phone: 612/279-0456

or to such other address as either party may hereafter designate in writing to the other party.

13. TESORO and Bay West shall each designate in writing an individual or individuals to serve as their representatives during the performance of this Agreement.

14. No waiver of or failure to enforce any term of this Agreement shall affect or limit a party's right thereafter to enforce and compel strict compliance with every term.

15. The headings in this Agreement are for the purposes of convenience and ready reference only and shall not be deemed to expand or limit the particular sections to which they pertain.

16. In the event any part of this Agreement shall be judged invalid or unenforceable, such invalidity or unenforceability shall not affect the remaining provisions of this Agreement.

17. This Agreement represents the entire understanding between the parties. This Agreement shall be amended only by a writing signed by both parties.

18. Any controversies, claims, disputes, or litigation arising from or related to work to be performed under this agreement or under a work order are governed by the law of Minnesota.

**Figure 1.10-14**
**Bay West Deployment Exercise**

Figure 1.10-14
Tesoro Hight Plains Pipeline Bay West Deployment Exercise Response Resources

Bay West
Customer-Focused Environmental & Industrial Solutions

Bay West Inc.
5 Empire Drive, St. Paul, MN 55103
651-291-0456 * FAX 651-291-0099
www.baywest.com * info@baywest.com

## Documentation Form for OSRO Retainer Customers of Bay West, Inc.
## *Announced Equipment Deployment Exercise*

1. **Date Performed**: *October 13, 2011*

2. **Deployment Location(s)**: *Mississippi River, St. Paul, MN, between I-35E Bridge and Smith Street High Bridge.*

3. **Time Start** *8:30 AM* **- End Time**: *12:15 PM*

4. **Equipment Deployed**: *OSRO-owned*

5. **Type and amount of equipment deployed and number of support personnel employed**:
   Bay West deployed: 1000 feet of containment boom, two Sea Ark boom deployment boats, one 18' Lund boat; one air compressor and double-diaphragm pump, one JBF DIP-400 skimmer, one Elastec TDS-118 skimmer, one Mantaray skimmer, and 14 response personnel. A sub-contracted 2500 gallon vacuum truck was also dispatched to the site.

6. **Describe goals of the equipment deployment exercise and list any area contingency plan strategies tested**.
   Due to low water levels, safe areas to perform the drill were limited to river sections where deeper channels were accessible. In September of 2011, a large multi-agency emergency response drill was performed near the confluence of the Minnesota and Mississippi Rivers. The multi-agency drill scenario was described as an Airbus 319 loses power and ditches in the river near the airport. In the multi-agency drill, responders did mock removals of passengers and reported that an estimated 3,600 gallons of fuel has been released from the airplane. OSRO deployment was not part of the drill; however, table top discussions between Bay West and other agencies during the response developed a response plan for fuel/oil recovery. Bay West, through discussions with the Minnesota Pollution Control Agency, who actively participated with Bay West during this year's OSRO deployment, decided to design this year's deployment to simulate the recovery of fuel/oil that would have resulted from the scenario outlined in the multi-agency plane crash drill.

   The goal of this drill was to identify oil diversion and collection points down stream of the release point, and test the use of boom against barges. One of the table top oil response collection methods was to utilize one or two of the barges that typically reside in this stretch of the river to divert oil to the shore line. Upper River Services, the company that shuttles barges in this area, indicated that they could deploy an empty barge to a spill that occurs near St. Paul within one to two hours. Additionally, Bay West evaluated if the published OSRO deployment tactical plan (designed by WAKOTA CAER) for this stretch of the river accurately described the deployment resources and methods.

   The Lilydale Regional Park Boat Landing was identified as the best location for the deployment and would be a logical down river point for collection if the crash were to occur near the airport. This deployment is consistent with strategies that have been developed for the Mississippi River. Booming and recovery activities were developed to respond to a location as near to the release as possible and recover as much product as possible before shoreline and down river sensitive areas became contaminated. The below map depicts how boom was deployed using the two Sea Ark boats and man power from shore.

Tesoro Hight Plains Pipeline | Figure 1.10-14 Bay West Deployment Exercise | Response Resources

Bay West
Customer-Focused Environmental & Industrial Solutions

Page 2

Pipeline Spill Response Plan
Tesoro Logistics LLC
July 2012

1.10-27

Figure 1.10-14

Tesoro Hight Plains Pipeline Bay West Deployment Exercise Response Resources

Bay West
Customer-Focused Environmental & Industrial Solutions

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7. **For deployment of facility-owned equipment, was the amount of equipment deployed *at least* the amount necessary to respond to an AMP Spill?** *NA*
8. **For deployment of OSRO-owned equipment, was a representative sample (at least 1,000 feet of boom and one of each type of skimming system) deployed?**
   *Yes. 1000 feet of boom was deployed as shown in the above graphic.*
9. **Was the equipment deployed in its intended operating environment?** *Yes*
10. **Are all facility personnel that are responsible for response operations involved in a Comprehensive Training Program, and all pollution response equipment involved in a Comprehensive Maintenance Program?**
    *OSRO participation has an USCG verified program for training and maintenance. Bay West follows the requirements of PREP.*
11. **Date of Last Equipment Inspection**: *Summer 2011. Also, much of our equipment has been deployed numerous times during 2010.*
12. **Was the equipment deployed by personnel responsible for its deployment in the event of an actual spill?** *Yes*
13. **Was all the deployed equipment operational? If not, why not?** *All Bay West equipment performed properly.*
14. **Identify which of the 15 core components of your response plan were exercised during this exercise**: *NA, not facility performed.*
15. **Description of lesson(s) learned and person(s) responsible for follow-up and corrective measures.**

    1. Boat traffic and wakes can affect boom effectiveness and anchoring of the boom
    2. Recreational users of the boat landing can be a safety hazard and delay deployment efforts
    3. Upper River Services could be called on to deploy a barge to be positioned in a manner to divert product. Methods such as barge "belting with cables" or magnets should be tested soon to assess better ways to connect boom to barges.
    4. The published tactical plan for this section of river indicates that 1,000 feet of boom would be necessary to collect oil. Our deployment confirmed that 1,000 feet of containment boom outlined in the tactical plan would be sufficient for oil diversion and collection activities.

Formal follow-up regarding these lessons learned are not necessary. However, Bay West will include these lessons learned in future training events. Bryan Murdock will be responsible for ensuring this knowledge is transferred to future OSRO staff.

* This documentation form is valid for 2011 Bay West OSRO customers only, in order to comply with your Federal Facility Response Plans. Retain this record for at least five years.

Bryan Murdock

Certifying Signature

Emergency Response & OSRO Manager, Bay West, Inc.

**Figure 1.10-15**
**Quali Tech Agreement**

TESORO MARITIME COMPANY
300 Concord Plaza Drive
San Antonio, Texas 78216-6999
210-828-8484
210-828-8600 Facsimile

April 1, 2000

Mr. Mark Ploen
318 Lake Hazeltine Drive
Chaska, Minnesota 55318-1093

RE: Consulting Agreement
Tesoro's Legal File No. 70-0007

Dear Mr. Ploen:

This letter, when executed by you, will contain and establish an agreement ("Agreement") between Tesoro Maritime Company, a Delaware corporation ("Tesoro"") and you ("Consultant") whereby Consultant shall act as an independent contractor to Tesoro on a non-exclusive basis to perform consultation services to Tesoro under the following terms and conditions.

1. Consultant shall advise and assist Tesoro with respect to the environmental, regulatory and spill response compliance issues applicable to the Prince William Sound in the State of Alaska. Consultant represents and warrants that he shall at all times during the term of this Agreement act in the best interest of Tesoro, and take no action which is or might be detrimental to the interests of Tesoro.

2. Consultant agrees to on call as needed during the term hereof exclusively to the performance of his duties hereunder.

3. Consultant is not an agent or employee of Tesoro. Consequently, Consultant does not have authority on behalf of Tesoro or to bind Tesoro or any affiliate of Tesoro to any legal obligation whatsoever, or to hire or retain other parties at Tesoro's expense, without Tesoro's prior written approval. Consultant shall coordinate the performance of his duties hereunder with one or more individuals designated by Tesoro in writing. Until further notice, Consultant shall coordinate the performance of his duties hereunder with Mr. Eric Haugstad, manager, contingency planning and emergency response.

4. Tesoro will pay Consultant a fee of $600.00 per day during the term hereof, which shall be payable in arrears, monthly within fifteen (15) days of Tesoro's receipt of Consultant's invoice.

**Figure 1.10-15 (Cont.)**
**Quali Tech Agreement**

Mr. Mark Ploen
April 1, 2000
Page 2

Tesoro shall include with each monthly payment of fees, a payment for any additional charges and reimbursable expenses for which Tesoro has been properly invoiced in accordance with this paragraph.

Tesoro agrees to reimburse Consultant only for those reasonable and necessary business expenses which are incurred in the performance of this Agreement. Individual expense items in excess of $1,000.00 must be approved in advance by Tesoro.

Tesoro shall reimburse Consultant for reasonable lodging, coach class airfare, car rental, telephone and parking fees for travel to Alaska.

Consultant shall submit to Tesoro during the term hereof, a report describing the reimbursable expenses incurred by Consultant, during the prior month, which report shall include receipts for all reimbursable expenses in excess of $25.00. The report shall be submitted by Consultant on or before the fifteenth (15th) day of the month following the month covered by the report.

If required, Tesoro may withhold any sum required pursuant to any applicable law or governmental regulations.

5. This Agreement is effective beginning April 1, 2000, ending March 31, 2001, and then shall continue on a month-to-month basis unless and until terminated by either party as hereinafter set forth. In the event of a material breach of this Agreement, the non-defaulting party may terminate this Agreement by providing written notice thereof to the other party, and such termination shall be effective immediately upon delivery of notice. Either party may terminate this Agreement by providing written notice of such termination to the other party, and such termination shall be effective thirty (30) days after such notice. Upon such termination, Tesoro shall only be obligated to pay Consultant for work actually performed (which payment shall be pro-rated, based on a rate of $600.00 per day) and reimbursable expenses incurred by Consultant for which he has not received payment, and such payment shall be due within fifteen (15) days following Tesoro's receipt of Consultant's invoice therefor.

6. Consultant will receive, from time-to-time, in connection with work contemplated under this Agreement, Confidential Information applicable to Tesoro, Tesoro's affiliated companies, ARCO Marine, Inc., BP Oil Shipping Company, USA, Chevron Shipping Company, LLC, SeaRiver Maritime, Inc. (the "Priviledged Parties"). "Confidential Information" as used herein shall refer to all non-public information of the Priviledged Parties provided to consultant in connection with this Agreement. Consultant will use his best efforts to prevent the disclosure of any of any

**Figure 1.10-15 (Cont.)**
**Quali Tech Agreement**

Mr. Mark Ploen
April 1, 2000
Page 3

Confidential Information to third parties during the term of this Agreement and for a period of five (5) years from termination of this Agreement, provided that Consultant's obligation under this paragraph shall not apply to:

(a) information that is already in Consultant's possession with no obligation of confidentiality at the time of disclosure thereof;

(b) information that later becomes publicly known or part of the public domain through no fault of the Consultant;

(c) information that is received from a third party having no obligation of confidentiality to any Priviledged Party;

(d) information that is independently developed by the Consultant; or

(e) information that is required by law or regulation to be disclosed.

7. Consultant will file all required governmental reports, if any, and will pay all taxes due, if any, with respect to the consulting fee received under this Agreement.

8. This Agreement and Consultant's services hereunder shall be performed in full compliance with all applicable laws and regulations. The interpretation of this Agreement shall be governed by the laws of the State of Texas and of the United Sates.

9. Tesoro and Consultant each represent and warrant that this Agreement has been duly executed and delivered and constitutes a valid and legally binding agreement, and, to the best of their knowledge and belief, neither the execution and delivery of, nor performance of, the provisions of this Agreement will conflict with or result in a breach of any law, or any regulation, order, writ, injunction or decree of any court or governmental authority of any jurisdiction in which this Agreement is to be performed.

10. Since a breach of the provisions of this Agreement could not adequately be compensated by money damages, Tesoro shall be entitled, in addition to any other right or remedy available to it, to an injunction restraining such breach or a threatened breach and to specific performance of this Agreement, and no bond or other security shall be required in connection therewith, and Consultant hereby consents to the issuance of such injunction and to the ordering of specific performance.

**Figure 1.10-15 (Cont.)**
**Quali Tech Agreement**

Mr. Mark Ploen
April 1, 2000
Page 4

11. All notices required or permitted under this Agreement shall be in writing and shall be deemed to be given when personally delivered or when deposited in the United States mail, postage prepaid, registered or certified mail, return receipt requested, addressed to the parties at the following respective addresses or at such other addresses as may have been therefore specified by written notice delivered in accordance with this paragraph:

Mark Ploen
318 Lake Hazeltine Drive
Chaska, Minnesota 55318-1093

Tesoro Maritime Company
300 Concord Plaza Drive
San Antonio, Texas 78216-6999
Attn: Eric Haugstad

12. Consultant may not assign this Agreement without the express written consent of Tesoro. Tesoro may assign this Agreement to any party.

13. This Agreement supersedes and shall be deemed to supersede all other agreements, understandings and communications on the subject hereof, both written and oral, which have been heretofore made between Tesoro and Consultant, if any.

TESORO MARITIME COMPANY.

By _____
Stephen L. Wormington, President

ACCEPTED AND AGREED as of
the 9 day of April, 2000

_____
Mark Ploen

_____
Social Security Number

wplegsh\tesp\70-0007\markploen-consltagr.

## 1.2 REPORTING AND NOTIFICATION

***SPILLAGE OF ANY PETROLEUM HYDROCARBON OR OTHER HAZARDOUS SUBSTANCE ONTO LAND OR WATER MUST BE IMMEDIATELY REPORTED! THERE ARE NO EXCEPTIONS!***

The Tesoro Incident Commander should confirm that all spills from the Pipeline are properly reported within mandated timeframes to the required federal/state agencies. Personal and direct communication must be made by the Incident Commander or his designee.

If a spill is detected, the following information should be provided to the Incident Commander:

1. Was anyone hurt?
2. Location of spill.
3. Time of spill.
4. Product/volume spilled.
5. Source of spill.
6. Actions taken.
7. Weather conditions.
8. Projected spill movement.
9. Equipment needed.
10. Environmental concerns.
11. Initial site monitoring results.

Never speculate or guess when discussing or reporting a spill. Report only facts.

Figure 1.2-1 provides a notification flow chart to ensure that the appropriate responders and agencies are notified within 30 minutes of discovery. The Discharge Information Checklist (Figure 1.2-2) should be completed as completely as possible before initiating agency notifications, however, notification should not be delayed pending completion of the form. This report may be used for all hydrocarbons or chemicals to ground or water. A copy of the written report should be faxed to Rob Donovan, Vice President of Environmental-Marketing & Logistics at (253) 896-8863 or Eric Haugstad, Director, Contingency Planning and Emergency Response at (210) 626-4636 after notification and mitigation procedures have been implemented.

Table 1.2-1 lists Tesoro notification information for pipeline and terminal personnel, as well as, corporate response personnel. Table 1.2-2 list County emergency response organizations. Table 1.2-3 lists emergency response contractors. Table 1.2-4 lists state and federal agencies. Table 1.2-5 lists sensitive area managers including natural resource trustees and surface water intakes. Tables 1.2-6 through 1.2-9 list airports, schools, hospitals and media organizations. Table 1.2-10 provides a notification log sheet for the caller to document which organizations and agencies have been notified.

Tesoro employees and contractors are not to provide <u>any</u> information about a spill to anyone other than the designated on-scene representatives of the federal, state, and local agencies.

***<u>No statements</u>*** should be made regarding the following subjects, except by persons designated by the Incident Commander:

- Liability for spill.
- Estimates of damage expressed in dollars ($).
- Estimates of the duration of cleanup.
- Commitments regarding effectiveness of cleanup.
- Comments regarding appropriateness/effectiveness of public or private involvement.

All inquiries from newspapers, radio stations, and television stations will be referred to the Incident Commander.

## INCIDENTS REQUIRING IMMEDIATE INTERNAL CORPORATE MANAGEMENT NOTIFICATION

The Tesoro Health and Safety standard TSHS-006 will be used to determine the type and severity of an incident. Incidents determined to be at severity Level 3 – Level 5 must be reported to Corporate Headquarters.

TSHS-006 can be found on the Tesoro intranet on the Environmental Health and Safety page at http://gotso/departments/ehs/Documents/Incident%20Matrix.pdf

**Figure 1.2-1**
**Notification Flow Chart**

**FIELD or NUSTAR CONTROL CENTER (210-918-4937) REPORTS SPILL TO:**

**TESORO QUALIFIED INDIVIDUALS (QIs)**
Make contact with one of the QIs listed in **TABLE 1.2-1**

**MANAGER, CRUDE PIPELINE & TRUCKING**
701-225-8973 x101or 701-690-3438

**GM, PIPELINE & TERMINAL OPERATIONS**
210-626-4585 or 210-240-5613

**TESORO INCIDENT COMMANDERS ON-DUTY** (for incidents Tier 3-5)

IC DUTY HOTLINE 1-866-516-6758 OR 210-626-4175

**OIL SPILL RESPONSE ORGANIZATIONS (OSRO's)**

**BAY WEST, INC:** 800-279-0456
**QUALITECH:** 612-963-5222
**CEDA:** 701-663-0307

**TESORO INCIDENT MANAGEMENT TEAM**
Reference **TESORO NOTIFICATIONS (TABLE 1.2-1)**

**FEDERAL/STATE REGULATORY AGENCIES**

**NATIONAL RESPONSE CENTER / PHMSA (within 1 hour of incident)**
800-424-8802 (24 hr) – **REFERENCE** Oil Spill Report Form (next page)

**NORTH DAKOTA DIVISION OF EMERGENCY MANAGEMENT**
701-328-0820

**COUNTY EMERGENCY MANAGEMENT COORDINATOR**
(See **TABLE 1.2-2**)

**EPA – REGION 8**
800-227-8914

### 1.2.1 Accident Reports

The Pipeline Manager shall ensure the following telephonic reporting, as required, is performed at the earliest practicable moment:

1. The local fire department having jurisdiction;
2. Local Emergency Planning Committee; and
3. The National Response Center (for spills to navigable waters).

The Pipeline Manager will also be responsible for the completion and transmittal of a written *Accident Report-Hazardous Liquid Pipeline Systems* (Form PHMSA F 7000-1) as soon as practicable, but no later than 30 days after the discovery of the accident, as described in Section 7 of the *Pipeline Operation and Maintenance Manual*.

If any information is discovered after the submittal of the written report that changes or adds to the original *Accident Report-Hazardous Liquid Pipeline Systems*, Tesoro shall submit a supplemental report within 30 days.

The *Accident Report-Hazardous Liquid Pipeline Systems*, Form PHMSA F 7000-1 can be obtained from the following web site: http://www.phmsa.dot.gov/pipeline/library/forms

### 1.2.2 General Guidelines for Prompt Reporting of Serious Environmental Incidents

Releases, emissions and violation notices cover a wide spectrum of severity and importance. Presented below are guidance examples of what types of occurrences should and should not be reported to Tesoro's Corporate Environmental Function in a prompt manner.

***Serious Environmental Incidents* that should be internally reported include:**

- Oil Spills that require OSRO participation and skimming equipment deployment.
- Oil Spills or Chemical Releases that have or will likely result in significant interest by the regulatory agencies. Significant regulatory interests include NOVs or citations issued on-site and/or regulatory personnel requesting additional personnel from the same or other regulatory jurisdictions.
- Oil Spills or Chemical Releases that have or will likely result in significant interest by the Press. This includes the arrival of radio, newspaper or television press personnel at the scene, or a subsequent request for a detailed telephone interview on the incident.
- Oil Spills that have directly impacted or oiled wildlife.
- Chemical releases resulting in on-site evacuations.
- Chemical Releases resulting in off-site impacts, shelter-in-place notifications or evacuations.

***Serious Environmental Incidents* generally do <u>not</u> include occurrences such as:**

- Oil spills onto pavement or impervious containment that are not greater than the portable spill retrieval equipment on-site.
- Oil spills onto gravel or native soil that is less than Reportable Quantities and are not believed to directly threaten groundwater.
- Oil Spills to water that are readily corrected by self-deployed spill pads and sorbents.

Releases that are not considered to be Serious Environmental Incidents should be reported to Corporate via telephone during an opportune time and by faxing the Incident Log or Spill Report.

# Figure 1.2-2
# Discharge Information Checklist

**DO NOT DELAY NOTIFICATION IN ORDER TO COLLECT ALL INFORMATION ON THIS SHEET**
**NATIONAL RESPONSE CENTER (NRC) (800) 424-8802 (within 1 hour)**
**NORTH DAKOTA DIVISION OF EMERGENCY MANAGEMENT (800) 472-2121 or (701) 328-9921**
**Note: it is not necessary to wait for all information before calling NRC.**

**REPORTING PARTY INFORMATION**

Name: _____ Position: _____ Company: _____
Day Telephone: _____ Evening Telephone: _____
Address: _____
City: _____ State: _____ Zip: _____
Were Materials Discharged? **YES/NO** Confidential? **YES/NO**
Meeting Federal Obligations to Report? **YES/NO** Date Called: _____
Are you calling for the responsible party? **YES/NO** Time Called: _____

**INCIDENT DESCRIPTION**

Source and/or Cause of incident: _____
Date of Incident: _____ Time of Incident: _____
Incident Address/Location: _____
Nearest City: _____ State: _____ County _____ Zip _____
Distance From City: _____ Direction from City: _____
Section _____ Township _____ Range _____ Borough _____
Container Type _____ Tank Oil Storage Capacity _____
Facility Oil Storage Capacity: _____
Facility Latitude: Facility Longitude:

**MATERIAL DISCHARGE**

| CHRIS CODE | Discharged Quantity | Unit of Measure | Material Discharged in Water | Quantity | Unit of Measure |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

**RESPONSE ACTION**

Actions Taken to Correct, Control, or Mitigate Incident?

**IMPACT**

Number of Injuries: _____ Number of Fatalities: _____
Were there Evacuations? YES//NO Number Evacuated: _____
Was there any Damage? YES/NO Damage in Dollars (approximate): _____
Medium Affected: _____
Description: _____
More Information about Medium:

**ADDITIONAL INFORMATION**

Any Information about the incident not recorded elsewhere in the report:

**CALLER NOTIFICATIONS**

**EPA** YES/NO | **PHMSA** YES/NO | **STATE** YES/NO | **OTHER** YES/NO **Describe:**

## Table 1.2-1
## Tesoro Notifications

(b) (6) [redacted]

***Tesoro High Plains Pipeline***

| Name | Office | Facsimile | Cellular |
|---|---|---|---|
| Primary QI<br>Gary Oversen<br>Manager, Crude Pipeline & Trucking | (701) 225-8973 ext. 101 | (701) 483-9488 | (701) 690-3438 |
| Alternate QI<br>Greg Andersen<br>Supervisor Pipeline Operations | (701) 225-8973 ext. 102 | (701) 483-9488 | (701) 260-2975 |

***Nustar San Antonio Operations Center***

| Name | Office | Facsimile | Cellular |
|---|---|---|---|
| James Bowen, Control Center | (210) 918-3943 | | (210) 414-8166 |

***Corporate Response Personnel***

| Name | Office | Facsimile | Cellular |
|---|---|---|---|
| Rob Donovan, VP Environmental-Marketing & Logistics | (253) 896-8716 | (253) 896-8863 | (206) 612-1361 |
| Eric Haugstad, Director Contingency Planning and Emergency Response | (210) 626-4636 | (210) 745-4502 | (210) 865-9018 |
| Jeff Haffner, Associate General Counsel (Attorney) | (210) 626-4418 | | (210) 240-1806 |

## Table 1.2-1 (*continued*)
## Tesoro Notifications

**EMERGENCY CALL OUT LIST**

| Facility | Person Responsible | Primary Backup | Alternate | Alternate 2 | Alternate 3 |
|---|---|---|---|---|---|
| ***Tioga, ND Area*** | | | | | |
| Border Station | Mike Orluck | Andy Huseby | Monica Miller | Greg Andersen | Gary Oversen |
| Black Slough | Mike Orluck | Andy Huseby | Monica Miller | Greg Andersen | Gary Oversen |
| Battleview | Mike Orluck | Andy Huseby | Monica Miller | Greg Andersen | Gary Oversen |
| Tioga | Mike Orluck | Andy Huseby | Monica Miller | Greg Andersen | Gary Oversen |
| Ramberg | Mike Orluck | Andy Huseby | Monica Miller | Greg Andersen | Gary Oversen |
| ***New Town, ND Area*** | | | | | |
| Yetterdahl | Gary Galster | Tim Johnson | Jamie Jellesed | Greg Andersen | Gary Oversen |
| Keene | Tim Johnson | Gary Galster | Jamie Jellesed | Greg Andersen | Gary Oversen |
| Blue Buttes | Tim Johnson | Gary Galster | Jamie Jellesed | Greg Andersen | Gary Oversen |
| Charlson | Gary Galster | Tim Johnson | Jamie Jellesed | Greg Andersen | Gary Oversen |
| ***Sidney, MT Area*** | | | | | |
| Cartwright | Austin Bement | Ryan Baumgartner | Wayne Ash | Greg Andersen | Gary Oversen |
| Alexander | Austin Bement | Ryan Baumgartner | Wayne Ash | Greg Andersen | Gary Oversen |
| Fairview | Ryan Baumgartner | Wayne Ash | Austin Bement | Greg Andersen | Gary Oversen |
| Poker Jim | Wayne Ash | Ryan Baumgartner | Austin Bement | Greg Andersen | Gary Oversen |
| Putnam | Ryan Baumgartner | Austin Bement | Wayne Ash | Greg Andersen | Gary Oversen |
| Richey | Ryan Baumgartner | Austin Bement | Wayne Ash | Greg Andersen | Gary Oversen |
| Sidney | Wayne Ash | Ryan Baumgartner | Austin Bement | Greg Andersen | Gary Oversen |
| ***Dickinson, ND Area*** | | | | | |
| Dodge | Gary Carson | Richard Pelton | Don Lawson | Greg Andersen | Gary Oversen |
| Dunn Center | Gary Carson | Richard Pelton | Don Lawson | Greg Andersen | Gary Oversen |
| Four Eyes | Gary Carson | Servil Hoff | Don Lawson | Greg Andersen | Gary Oversen |
| Hwy 22 | Gary Carson | Don Lawson | Roger Stein | Greg Andersen | Gary Oversen |
| Little Knife | Gary Carson | Don Lawson | Roger Stein | Greg Andersen | Gary Oversen |
| Mandan | Gary Carson | Richard Pelton | Don Lawson | Greg Andersen | Gary Oversen |
| Treetop | Gary Carson | Servil Hoff | Don Lawson | Greg Andersen | Gary Oversen |
| Whitetail | Gary Carson | Servil Hoff | Don Lawson | Greg Andersen | Gary Oversen |
| Fryburg | Gary Carson | Servil Hoff | Don Lawson | Greg Andersen | Gary Oversen |

**Table 1.2-1 (*continued*)**
**Tesoro Notifications**

(b) (6) [redacted]

| Name | Position | Location | Office | Cell | Sky Cell | Radio |
|---|---|---|---|---|---|---|
| Greg Andersen | Operations Supervisor | Dickinson | 701-225-8973 | 701-260-2975 | 888-479-0228 | 612 |
| Wayne Ash | Field Specialist III | Sidney | 406-482-4841 | 406-480-2071 | 888-430-5872 | 601 |
| Josiah Bamford | Pipeline Specialist I | Watford City | 701-842-2081 | 701-421-3392 | | |
| Ryan Baumgartner | Field Specialist III | Sidney | 406-482-4841 | 406-480-1911 | 888-419-1672 | 600 |
| Austin Bement | Field Specialist III | Sidney | 406-482-4841 | 406-480-2123 | 888-430-5876 | 604 |
| Paul Beyer | Pipeline Specialist III | Sidney | 406-482-4841 | 406-480-2124 | 888-430-5879 | 606 |
| Clay Bohmbach | Field Specialist II | Killdeer | 701-764-5526 | 701-260-2488 | 888-479-0226 | 610 |
| Gary Carson | Field Specialist III | Killdeer | 701-575-8573 | 701-260-0888 | 888-430-5877 | 605 |
| Christian Crosby | Technical Specialist I | Sidney | 406-482-4841 | 406-480-3288 | | |
| Steve Decker | Technical Specialist III | Sidney | 406-482-4841 | 406-480-2122 | 888-479-0227 | 611 |
| Gary Galster | Field Specialist III | New Town | 701-675-2544 | 701-898-4025 | | 183 |
| Tom Hansen | Field Specialist II | Killdeer | 701-225-8973 | 701-260-5047 | 888-430-5880 | 607 |
| Servil Hoff | Technical Specialist II | Dickinson | 701-225-8973 | 701-260-5053 | 888-430-5882 | 609 |
| Andrew Huseby | Technical Specialist III | Tioga | 701-664-2823 | 701-641-8567 | 800-605-4373 | 351 |
| Jamie Jellesed | Technical Specialist III | Watford City | 406-482-4841 | 406-480-3288 | 800-621-0578 | 1133 |
| Tim Johnson | Field Specialist III | New Town | 701-675-2510 | 701-898-4027 | 888-875-1580 | 185 |
| Jason King | Field Specialist I | Sidney | 406-482-4841 | 406-480-2073 | 888-624-8079 | |

(b) (6) [redacted]

| Name | Position | Location | Office | Cell | Sky Cell | Radio |
|---|---|---|---|---|---|---|
| Don Lawson | Technical Specialist III | Killdeer | 701-764-5526 | 701-290-1148 | 800-498-9443 | 598 |
| Monica Miller | Field Specialist III | Tioga | 701-664-2823 | 701-641-1103 | 888-882-9781 | 187 |
| Larry Moe | Pipeline Main. Supervisor | Watford City | 701-842-4036 | 701-570-4332 | 888-430-5873 | 602 |
| Mitchell Musgrave | Pipeline Specialist II | Watford City | 701-842-2081 | 701-421-2164 | | |
| Mike Orluck | Field Specialist III | Tioga | 701-664-2823 | 701-641-1124 | 888-818-2223 | 179 |
| Gary Oversen | Manager | Dickinson | 701-225-8973 | 701-690-3438 | 888-419-1671 | 599 |
| Richard Pelton | Technical Specialist III | Killdeer | 701-225-8973 | 701-260-5554 | 888-635-8496 | 170 |
| Roger Stein | Field Specialist III | Killdeer | 701-225-8973<br>701-863-6520 | 701-260-2356 | 888-823-4728 | 57 |

## Table 1.2-2
## County Emergency Response Organizations

| Counties | Emergency Management Coordinator | Fire | Sheriff / Dispatch | Ambulance | Hospital (Med Center One) |
|---|---|---|---|---|---|
| ***North Dakota*** | | | | | |
| Morton | (701) 667-3307 | (701) 667-3288 | (701) 667-3330 | (701) 667-3251 | (701) 323-6000 |
| Mercer | (701) 745-3302 | | (701) 745-3333 | | |
| Dunn | (701) 573-4612 | | (701) 573-4449 | | |
| McKenzie | (701) 770-7147 | | (701) 444-3654 | | (701) 842-3000 |
| Williams | (701) 577-7707 | | (701) 577-7700 | | |
| Mountrail | (701) 628-2909 | | (701) 628-2975 | | (701) 628-2424 |
| Burke | (701) 377-2311 | | (701) 377-2311 | | |
| Oliver | (701) 794-8760 | | (701) 794-3450 | | |
| Golden Valley | (701) 872-3917 | | (701) 872-4733 | | |
| Billings | (701) 623-4323 | | | | |
| ***Montana*** | | | | | |
| Richland | (406) 433-2220 | | (406) 433-2919 | | |

## Table 1.2-3
## Response Contractors

| Company | Primary Phone | 24-Hr. Phone |
|---|---|---|
| Bay West, Inc.<br>5 Empire Drive<br>St. Paul, MN 55103<br>www.baywest.com<br>*Spill Response* | (651) 291-0456 | (800) 279-0456 |
| Qualitech<br>318 Lake Hazeltine Drive<br>Chaska, MN 55318<br>www.qualitechco.com<br>*Response Equipment* | (952) 448-5151 | (612) 963-5222 |
| CEDA<br>2519 Old Red Trail<br>Mandan, ND 58554<br>*Spill Response* | (701) 663-0307 | (701) 434-4403 |
| ENTRIX, Inc.<br>590 Ygnacio Valley Road<br>Walnut Creek, CA 94596<br>www.entrix.com<br>*Environmental, NRDA, SCAT* | (925) 935-9920 | (800) 476-5886 |
| Kane Transport<br>*Carrier* | (612) 352-8788 | |

## Table 1.2-4
## State and Federal Agencies

***State Agencies***

| Required Notifications | Primary Phone | 24-Hr. Phone |
|---|---|---|
| State Emergency Response Commission (State Radio) | | (800) 472-2121 |
| North Dakota Department of Health<br>• Division of Waste Management<br>• Division of Water Quality<br>• Division of Air Quality | <br>(701) 328-5166<br>(701) 328-5210<br>(701) 328-5188 | |

***Federal Agencies***

| Required Notifications | Primary Phone | 24-Hr. Phone |
|---|---|---|
| National Response Center | | (800) 424-8802 |
| EPA – Region 8, Denver | (303) 312-6312 | |
| EPA – Region 8, Denver (EOC) | | (800) 227-8917 |
| DOT – PHMSA | (202) 366-8860 | |
| Corp. of Engineers | (402) 995-2417<br>701-225-0015 | 888-835-5971 |
| Dept. of Commerce – National Weather Service (Recorded Weather) | | (701) 223-3700 |
| Weather Information Number (Dial Up Voice) | | (701) 223-4582 |

## Table 1.2-5
## Sensitive Area Managers and Trustees

***Sensitive Areas – Bismarck/Mandan Area***

| Category | Agency/Trustee | Phone |
|---|---|---|
| ND State Wildlife Management Areas | ND Game and Fish Department | (701) 328-6347 |
| ND State Forests | ND Forest Service | (701) 328-9944 |
| ND State Parks | ND Parks and Recreation Department | (701) 328-5357 |
| ND National Wildlife Refuges | U.S. Fish and Wildlife Service | (701) 662-8611 |
| ND Federal Waterfowl Production Areas | U.S. Fish and Wildlife Service | (701) 662-8611 |
| Bird and Wildlife De-oiling | U.S. Fish and Wildlife Service | (701) 355-8507 |

***Surface Water Intakes – Bismarck/Mandan Area***

| Operator | Phone |
|---|---|
| Mandan City Water Treatment Plant | (701) 667-3275 |
| Bismarck City Water Treatment Plant | (701) 222-6612 (Plant)<br>(701) 224-1632 (Pager) |
| Lincoln Oaks Nursery | (701) 223-8575 |

***Wildlife Areas***

| Name | Phone |
|---|---|
| Lake Ilo National Wildlife Refuge | (701) 548-8110 |

## Table 1.2-6
## Airports

| Airport | Location | Phone |
|---|---|---|

| | | |
|---|---|---|
| Bismarck Municipal Airport | Bismarck | (701) 355-1800 |
| Watford City Municipal Airport | Watford City | (701) 842-2523 |
| Sloulin Field Int'l. Airport | Williston | (701) 774-8594 |
| Tioga Municipal Airport | Tioga | (701) 664-2228 |
| Great Lakes Airlines | Dickinson | (701) 225-3822 |

## Table 1.2-7
## Schools

| School | Address | City | Phone |
|---|---|---|---|
| Custer Elementary School | 205 8th Avenue NE | Mandan, ND | (701) 663-5798 |
| St. Joseph Elementary School | 410 Collins Avenue | Mandan, ND | (701) 663-9563 |
| Special Education Pre-School | 309 Collins Avenue | Mandan, ND | (701) 663-6214 |
| Morton/Burleigh County Supt.-School | 210 2nd Avenue NW | Mandan, ND | (701) 667-3315 |
| Mandan Junior High School | 2901 12th Avenue NW | Mandan, ND | (701) 663-7491 |
| Mandan High School | 905 8th Avenue NW | Mandan, ND | (701) 663-9532 |
| Lewis & Clark Elementary School | 600 14th Street NW | Mandan, ND | (701) 663-7551 |

## Table 1.2-8
## Hospitals

| Hospital | Address | City | Phone |
|---|---|---|---|
| Medcenter One | 300 N. 7th Street | Bismarck | (701) 323-6000 |
| St. Alexius Medical Center | 900 E. Broadway Avenue | Bismarck | (701) 530-7000 |
| Metro Area Ambulance | 1139 Memorial Highway | Bismarck | Non Emergency (701-223-1310); Emergency (701) 255-0812 |
| McKenzie County Memorial Hospital | 516 N. Main | Watford City | (701) 842-3000 |
| St. Joseph's Hospital | 30 West 7th St. | Dickinson | (701) 456-4000 |
| Mercy Medical Center | 1301 15th Ave. W. | Williston | (701) 774-7400 |
| Tioga Medical Center | 810 N. Welo | Tioga | (701) 664-3305 |

## Table 1.2-9
## Media Organizations

| Name | Type | City | Phone |
|---|---|---|---|
| Mandan News | Newspaper | Mandan | (701) 663-1164 |
| Bismarck Tribune | Newspaper | Bismarck | (701) 223-2500 |
| KFYR AM 210 | Radio | Bismarck | (701) 255-8100<br>(701) 258-0550 |
| KBMR/KQDQ AM Radio | Radio | Bismarck | (701) 255-1234 |
| KFYR TV | Television | Bismarck | (701) 255-8105 |
| KXMB TV | Television | Bismarck | (701) 223-9197 |

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**Table 1.2-10**
**Notification Log Sheet**

| Organization/Agency Notified | Date | Time | Person Contacted | Comments/Actions |
|---|---|---|---|---|
| | | | | |
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## 1.3 SAFETY

***SAFETY IS THE PRIMARY CONSIDERATION IN THE RESPONSE TO AN OIL SPILL. NO SPILL RESPONSE ACTIVITIES SHOULD BE CONDUCTED UNTIL IT IS SAFE!***

### 1.3.1 Initial Response

**The Tesoro Safety Officer is:**

**Stuart Sipma ..... (701) 667-2445**

**His back-up is:**

**Wes Ussery ..... (701) 667-2477**

The Health and Safety Plan in Appendix A can be used to identify hazards to responders during the initial response.

The initial Incident Commander, will be responsible to assure the safety of all people who may be impacted by the spill. The Tesoro Safety Officer will be responsible for the preparation of the Safety and Security Plan, and will be responsible for direction of all safety and security activities during a major Tesoro spill response. All spill response contractor Safety Officers will be advisors to the Tesoro Safety Officer on health and safety issues. The Tesoro Safety Officer will direct teams of trained operators to determine and mark the area of any vapors emanating from the spill so that safe limits for response activities can be determined.

Hazards associated with oil spills include fires, explosions, and exposure to toxic chemicals at lethal or sub lethal levels. ***The initial priority during an oil spill is to protect the health and safety of affected and response personnel.***

***The first person to discover a spill of potentially toxic, flammable or explosive material should immediately leave the area and then report the spill.***

***It is critical to immediately assess the fire and explosion hazard associated with any spill.*** Petroleum hydrocarbons and many other products carried by trucks, stored in tanks, or transported in pipelines are flammable and can be explosive.

## 1.3.2 Incident Safety Plan

In addition to assessing the dangers of explosion and fire, the Tesoro Safety Officer will ensure the protection of worker health and safety. This protection is achieved by assessing and establishing exposure control zones to which only appropriately trained and equipped personnel may enter.

The criteria for establishing safety zones and respiratory protection requirements for petroleum products handled by the pipeline may use spill response limits for petroleum distillates (i.e., 500 ppm for 8-hours or 333 ppm or 12 hours).

Personal equipment recommended for protecting ***SKIN*** includes PVC gloves and boots for hands/feet, and PVC rain suit or Tyvek coveralls for the body.

At a minimum, safety glasses should be worn for ***EYE*** protection. Chemical goggles or a face shield should be used if a splash hazard is present. Eye protection is not required if a full-face respirator is worn.

Local police and fire departments will be notified of all major spills and, if necessary, their on-site assistance will be requested to ensure personnel health and safety.

The Tesoro Safety Officer will prepare an Incident-Specific Health and Safety Plan. The format to be followed in developing an incident-specific Health & Safety Plan is provided in Appendix A. Material Safety Data Sheets (MSDS) are available at the pipeline field offices and included in Appendix D of this Plan. At minimum, the following federal safety standards will be addressed in the development of the Incident-Specific Health and Safety Plan:

- 29 CFR Part 1910, Occupational Health & Safety Standards
- 29 CFR Part 1904, Record keeping & Reporting Occupational Illnesses
- 29 CFR Part 1910.120, Hazardous Waste Operations and Emergency Response
- 29 CFR Part 1910.132-37 Subpart 1, Personal Protective Equipment
- 29 CFR Part 1920.38, Employee Emergency Action Plans & Fire Prevention

The Tesoro Safety Officer should be aware that local safety requirements are variable from state to state. The Tesoro Safety Officer should establish a dialogue with the North Dakota Department of Health and local oil spill response contractors to assure that safe work places are established for all responders that comply with local regulations.

## 1.3.3 Evacuation Plan

**Conditions for evacuation include the following:**

- Fire and explosion – Evacuate for other than minor events.
- Gasoline spills– Evacuate when flammable vapors are present.
- Tornado– Evacuate if tornado approaches terminal.
- Floods – Evacuate after warning from authorities.

## Evacuation Procedure

Evacuation may be required for several reasons, e.g., fires, explosion, spills, flooding, etc. The cause of the problem could originate on or off-site. If evacuation is required, all personnel on-site must be notified that they need to evacuate, and they must know where they should assemble. After an evacuation, all personnel must be accounted for.

If the event is an explosion, assist the injured if it is safe to do so, move to a safe location, and call 911 immediately.

If the event is a gasoline spill and flammable vapors are present, shut down all operations, warn all employees and/or visitors, and leave the area. Call 911 as soon as possible.

If a tornado should approach or appear to threaten the terminals, discontinue product transfer operations, and take cover. Report tornado to the emergency telephone: 911.

If a warning is received from authorities for an anticipated event such as a flood, shut down any ongoing operations. Close all valves and evaluate to vehicles. Move to a safe location as determined by local authorities.

In the event injured personnel require transportation to the hospital, refer to Section 1.2 for a list of hospitals.

## Community Evacuation Plan

The decision for community evacuation is typically made by county or municipal authorities. Refer to Section 1.2 for a list of Emergency Contacts by County. The appropriate officials will prepare in advance for a potential evacuation of county residents. The County Emergency Management Director is responsible for recommending evacuation or shelter-in-place.

Detailed information regarding evacuation procedures within each county is available in the County wide Emergency Operations Plan. The countywide plan details the evacuation routes established for populations at risk, traffic control systems, security, and staging areas.

Notification of residents will generally be accomplished by using the Emergency Alert System (EAS), telephone, door-to-door, siren warnings, or any other means deemed sufficient for notification. A description of the EAS is provided in Section 1.4, Communications.

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## 1.4 COMMUNICATIONS

This section describes the availability and assignment of communications equipment. Additional information will provided in the local Area Contingency Plan.

### 1.4.1 Initial Spill Communications

This section describes a number of different communication systems or "tools" which may be employed in a given spill situation. Communication equipment (i.e., telephones, radios, etc.) will be assigned at the discretion of the Incident Commander and/or the Section Chiefs. Channel and frequency functions will be assigned, as needed, as the response evolves. Air traffic control will be maintained by the Federal Aviation Administration (FAA).

***Telephone Circuits*** – Pipeline offices and most pump stations are equipped with telephones sufficient to handle the volume of telephone calls associated with small spills. Additional landline phone and fax lines are available at the pipeline stations. Additional temporary telephone lines may be required in the unlikely event of a major spill. Remote locations, however, may have very limited telephone service or no service at all. Or the reserve capacity of the system may be so small that temporary service to remote control centers cannot be quickly provided. Establishing microwave or satellite links to these areas using contractor resources may be required.

***Cellular Telephone Systems*** – Cellular telephone service can provide spill response managers immediate access to the telephone system from remote locations. Battery-powered cellular telephones are preferred to free the user from dependence on commercial power or vehicle batteries. Pipeline employees, and most Tesoro Corporate response personnel, are equipped with cellular phones.

***Satellite Radio and Phone System*** – Vehicles utilized by Tesoro High Plains Pipeline operating and maintenance personnel are equipped with Mitsubishi SZ300A microphone radio capability and handset phone dual mode ST100A series satellite telephones. A total of 25 of these units are available to support spill response operations. Radio numbers are listed in Section 1.2.

***Marine VHF Radio*** – Cleanup operations on the water should be provided with marine VHF radio equipment. Marine radios can be used for coordinating cleanup operations, however, other channels may be preferred where suitable equipment is available. Marine band mobile and portable units are available through the response contractors.

***HF, VHF and UHF Channels in the Petroleum Radio Service*** – In response to a petition from the American Petroleum Institute (API), the Federal Communications Commission (FCC) in 1975 allocated a number of radio channels in the Petroleum Radio Service for primary use in oil spill containment and cleanup operations. Some of the Petroleum Radio Service VHF channels are near in frequency to the band assigned to the Marine VHF Radiotelephone Service (156.025 to 157.425 MHz), presenting the possibility that a single radio and antenna system can be used to access both services. Equipment with digital frequency control and scanning capability could be used to monitor radio traffic and communicate on several channels in both services.

Communications between responders and agencies is critical during a response. In a major incident, police, fire, state, federal, and private responders usually do not share radio frequencies and cannot communicate without using an established and activated emergency channel.

***Paging Systems*** – These are one-way radio communication systems which enable a person within range of the paging system transmitter to be alerted. Oil response personnel carry pagers for rapid notification in the event of a spill. Pager numbers for personnel and corporate response personnel are listed in Section 1.2.

***Computer Modem Systems*** – Two desk-top computer systems with internet access are located at the pipeline offices.

### 1.4.2 Statewide Emergency Response Radio Frequencies

In North Dakota, State Radio Communications coordinate communications between agencies during a response. Within the sub-area in North Dakota, State Radio Communications, centrally dispatched VHF Radio Sites are located in: Grand Forks, Grand Forks County; Fargo, Cass County; and Wahpeton, Richland County. Communications occur over the following radio channels:

- National Emergency Channel 155.475 MHz
- National Emergency Medical 154.340 MHz
- Statewide Fire 154.295 MHz
- State Radio Channel 1* 154.935 MHz
- State Radio Channel 2* 154.905 MHz

* State Radio Channel may only be used with authorization from State Radio.

### 1.4.3 Emergency Alert System – Public Warning

The system in place for notifying the public of hazardous materials or oil incidents is the EAS via State Radio Communications at 800-472-2121 (in state) or 701-328-9921 (out of state).

In a national emergency, the President can issue an Emergency Activation Notification (EAN), activating EAS and allowing him to speak to the entire nation. In the event of a statewide emergency, authorized state officials can access the public through the broadcast and cable industry throughout North Dakota. Authorized county and local officials can access their local broadcast and cable media to inform the public of a local emergency. In addition, other agencies, such as the National Weather Service (NWS), can also access that same local media.

Additional Hotline numbers and federal agency website addresses are presented in Table 1.4-1.

**Table 1.4-1**
**Hotline Numbers and Federal Agency Website Addresses**

Listed below are the main website addresses for Federal agencies. These websites contain contact information for regional offices. If you do not have access to the Internet, visit your local library to get online. Local phone books will contain contact information for state offices.

To report a spill call the 24-hour National Response Center Hotline: 1-800-424-8802 www.nrc.uscg.mil/

Federal Emergency Management Agency: www.fema.gov

U.S. Environmental Protection Agency: www.epa.gov/ceppo (EPA maintains the RCRA, Superfund & EPCRA Hotline to answer questions at 1-800-424-9346).

Agency for Toxic Substances and Disease Registry: www.atsdr.cdc.gov/

U.S. Department of Energy: www.doe.gov

Department of Agriculture: www.usda.gov

Department of Labor, Occupational Safety & Health Administration: www.osha.gov

U.S. Coast Guard (G-MER), Marine Safety and Environmental Protection: www.uscg.mil/hg/g-m/gmhome.htm

U.S. Dept. of Transportation, Research and Special Programs Administration, Office of Hazardous Materials Safety HazMat Info Line 1-800-467-4922 and website: http:\\hazmat.dot.govhazmat.dot.gov/

Department of Justice, Environment and Natural Resources Division: www.usdoj.gov/enrd/enrd-home.html

Department of the Interior: www.doi.gov

Department of Commerce, NOAA: www.noaa.gov

Department of State: www.state.gov

Department of Defense: www.defenselink.mil

Nuclear Regulatory Commission: www.nrc.gov

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## 1.5 INCIDENT COMMAND SYSTEM

Tesoro will assume responsibility for the physical control, containment, and clean-up for the discharge of any petroleum from the Tesoro High Plains Pipeline. The Tesoro response will be managed under an Incident Command System (ICS) compatible with the National Interagency Incident Management System.

Tesoro will utilize spill response contractors for most response activities. These contractors also utilize ICS. Key response contractor managers may be incorporated directly into the Spill Management Team as needed.

The Tesoro Spill Management Team is also available to supplement the Tesoro High Plains Pipeline personnel. Tesoro maintains a sufficient number of qualified personnel to provide continuous coverage to a prolonged oil spill response effort. The team includes over 30 Tesoro employees from the Tesoro Logistics Operations LLC, located at the San Antonio Corporate Offices, and the Tesoro Alaska Petroleum Company, as well as numerous contract personnel. Team members receive cross training in all aspects of ICS, and routinely participate in exercises.

Tesoro's ICS organization chart is provided in Figure 1.5-1. Table 1.5-1 lists the name and ICS position to be held by members of the Tesoro team. Most of these team members are based either at the Tesoro Headquarters or other Tesoro facilities. Procedures are in place at both locations to activate this team. Personnel can be activated by calling:

| | |
|---|---|
| **Tesoro Director, Contingency Planning and Emergency Response** | **(210) 865-9018 (24 Hours a day)**<br>**(210) 626-4636 (Days)**<br>**(210) 481-0888 (Evenings & Weekends)** |

The Tesoro ICS organization is intended to facilitate effective response to different oil spill scenarios. The Incident Commander has the authority to activate any portion, or all of the response organization. The Incident Commander has the authority to utilize any or all members of the team in any position that he determines is required to adequately respond to insure personnel safety, minimize environmental damage, and prevent property damage. The Incident Commander also has the authority to approve contracts and order materials to respond to the spill.

Once an oil spill is detected, it will be reported to the Incident Commander. The most probable report route will be from terminal personnel, though spills could also be reported by vessel personnel, federal or state agencies, citizens groups, or from private citizens. The Incident Commander will direct any member, or the entire Tesoro Spill Response Team, to travel to the spill site and evaluate the spill as soon he has knowledge of the incident. He will then follow established checklists and utilize Tesoro ICS personnel to initiate the response to the oil spill.

## Figure 1.5-1
## Tesoro Spill Management Team Organization Chart

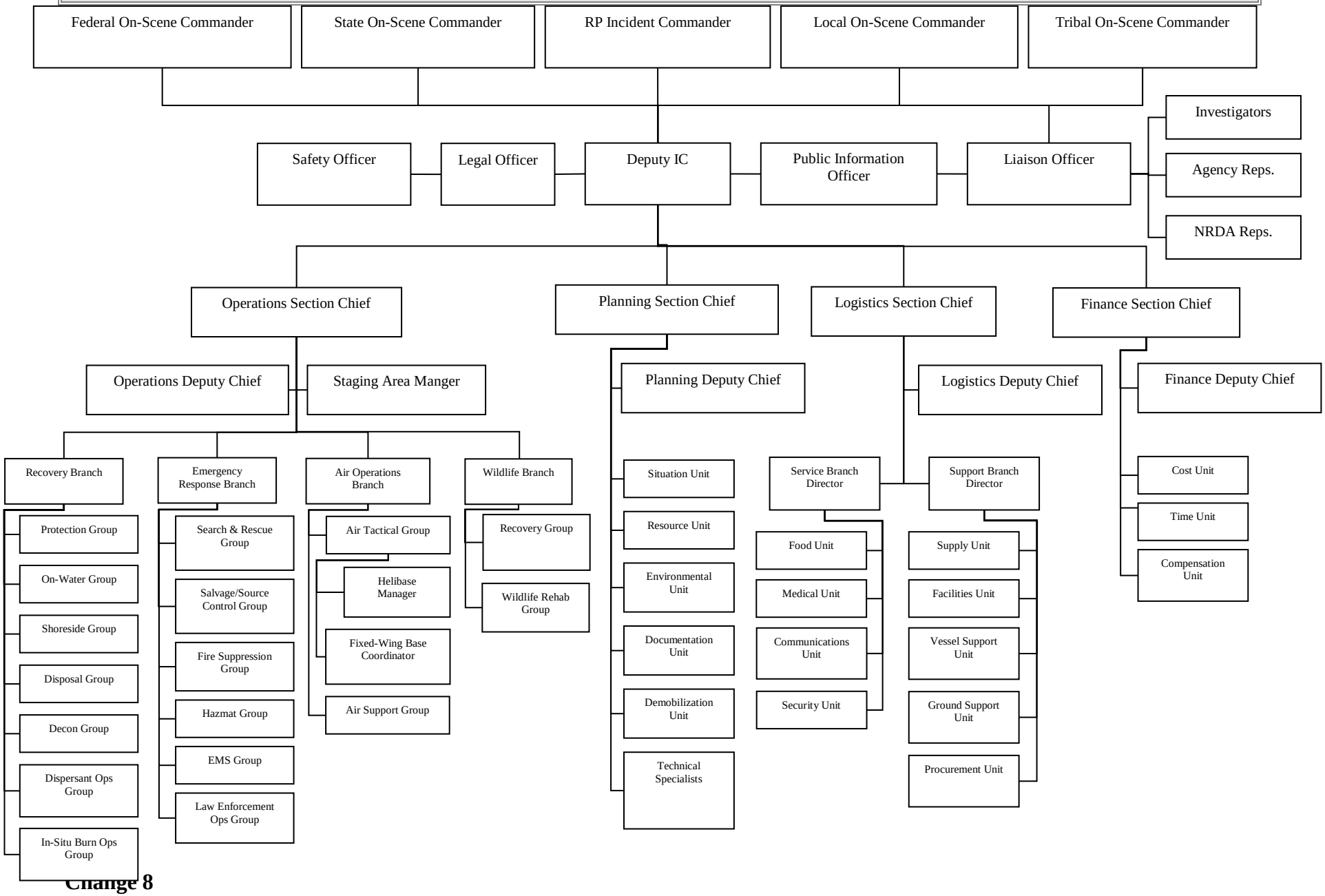


**Table 1.5-1**
**Oil Spill Incident Command and Response Team**

**1. SPILL RESPONSE MANAGER**

Incident Commander ..... Gary Oversen
Deputy Incident Commander ..... Greg Anderson
Deputy Incident Commander ..... John S. Berger

**2. COMMAND STAFF**

Legal Officer ..... David Schollars
Liaison Officer ..... D. P. Schaaf
Liaison Officer ..... B. J. Bandy
Public Information Officer ..... L. W. Peterson
Public Information Officer ..... R. W. Day
Public Information Officer ..... R. D. Binegar
Safety Officer ..... S. W. Sipma
Safety Officer ..... W. S. Ussery

**3. OPERATIONS SECTION**

Operations Section Chief ..... John Nixon
Operations Section Chief ..... Fire Department Officers

**4. PLANNING SECTION**

Planning Section Chief ..... R. W. Day
Planning Section Chief ..... D. N. Vinchattle
Resource Status Unit ..... D. N. Vinchattle
Resource Status Unit ..... R. A. Wangler
Resource Status Unit ..... G. Stoltz
Situation Status Unit ..... J. M. Frank
Situation Status Unit ..... L. F. Pritchard
Documentation Unit ..... D. K. Snider
Documentation Unit ..... T. K. Reisenauer
Documentation Unit ..... S. M. Stewart
Documentation Unit ..... T. M. Humann
Environmental Unit ..... D. P. Schaaf

**5. LOGISTICS SECTION**

Logistics Section Chief ..... G. W. Stroh
Logistics Section Chief ..... L. M. Black
Logistics Section Chief ..... K. J. Hadsell
Logistics Section Chief ..... E. J. Stroh

**6. FINANCE SECTION**

Finance Section Chief ..... J. K. Thomas
Insurance/Claims Unit ..... S. Schumacher

The ICS has been adopted so that response actions contractors, federal response groups, state response groups, and citizens response groups can be activated and meshed with the Tesoro team as required. A major oil spill will require the cooperation of federal, state, and local government agencies to adequately manage and respond to the spill. A Unified Command Team will be used to provide overall direction of the spill response and to insure that all interests and problems resulting from the spill are fully addressed.

The transfer of incident command authority (during drills and actual spills) will be announced during incident briefings (e.g., ICS 201 briefings) or operations briefings. Transfer of command will also be listed in the Incident Action Plan (IAP) and changes will be recorded on the appropriate command post displays and in the incident command log.

## 1.5.1 Incident Command Team Duties and Responsibilities

## QUALIFIED INDIVIDUALS

The roles of Qualified Individuals (Incident Commanders) and Emergency Response Coordinator will typically be filled by the same person. The Qualified Individual (QI) or Alternate will be responsible for coordinating the actions of the Pipeline in conjunction with the Federal On-Scene Coordinator. Tesoro Logistics LLC is the owner and/or operator of the facilities covered by this OSCP and the QI and Alternate are employees of Tesoro Logistics LLC.

**Responsibilities of the QI include:**

- Activation of internal alarms and hazard communications systems to notify all facility personnel, (if not already done).
- Notification of all response personnel, as necessary.
- Identification of the character, exact source, amount, and extent of the release, as well as other items necessary for notification.
- Notification and dissemination the necessary information to the appropriate federal, state and local authorities with designated response roles.
- Assessment of the interaction of the spilled material with water and/or other substances stored at the facility and notify response personnel at the scene of that assessment.
- Assessment of the possible hazards to human health and the environment due to the release. This assessment will consider both the direct and indirect effects of the release (i.e., toxic, irritating, or asphyxiating gases that may be generated, or the effects of any hazardous surface water runoffs from water or chemical agents used to control fire and heat induced explosion).
- Assessment and implementation of prompt removal actions to contain and remove the substance released.
- Coordination of rescue and response actions as previously arranged with all response personnel.
- Use authority to immediately access company funding to initiate cleanup activities and direct cleanup activities until properly relieved of this responsibility.

Section 1.1.3 provides a list of persons named to be QIs for Tesoro Logistics LLC. These individuals have been provided with written authority to utilize Tesoro Logistics LLC resources, as necessary, for oil spill response. Individuals named as QIs also have the authority to act as Incident Commanders and Emergency Response Coordinators.

## COMMAND STAFF

***Incident Commander*** – On most incidents, a single Incident Commander carries out the Command activity. The Incident Commander is selected through pre-designation, qualifications, or experience. The Incident Commander may have a deputy, who may be from the same entity or from an assisting entity. Deputies must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time.

a. Review common responsibilities.
b. Assess the situation and/or obtain a briefing from the prior Incident Commander.
c. Determine incident objectives and strategies.
d. Establish the immediate priorities.
e. Establish an Incident Command Post.
f. Establish an appropriate organization.
g. Approve and authorize implementation of an Incident Action Plan.
h. Ensure that adequate safety measures are in place.
i. Coordinate activity of all Command and General Staff.
j. Coordinate with key stakeholders and officials through the Liaison Officer.
k. Approve requests for additional resources or for the release of resources.
l. Keep agency or authorizing entity (Responsible Party) informed about incident status.
m. Approve, if appropriate, the use of trainees, volunteers, or auxiliary personnel.
n. Authorize release of information through the Information Officer.
o. Ensure incident funding is available.
p. Notify natural resource trustees(s) and coordinate with NRDA Representative(s).
q. Coordinate incident investigation responsibilities.
r. Seek appropriate legal counsel.
s. Order the demobilization of incident resources, when appropriate.

***Deputy Incident Commander*** – Assists the Incident Commander by carrying out assignments and duties as directed by the Incident Commander. In the event the Incident Commander could no longer perform his duties, the Deputy would assume those responsibilities.

***Liaison Officer*** – Incidents that are multi-jurisdictional, or involve several agencies, may require the establishment of the Liaison Officer position on the Command Staff. The Liaison Officer is the point of contact for the assisting and cooperating Agency Representatives and stakeholder groups. Only one Liaison Officer will be assigned for each incident, including incidents operating under Unified Command and multi-jurisdiction incidents. The Liaison Officer may have assistants, as necessary, and the assistants may also represent assisting agencies or jurisdictions.

a. Review Common Responsibilities.

b. Provide a point of contact for assisting and cooperating Agency Representatives.

c. Identify Agency Representatives from each agency, including communications link and location.

d. Maintain a list of assisting and cooperating agency and stakeholder group contacts.

e. Assist in establishing and coordinating interagency contacts.

f. Keep agencies supporting incident aware of incident status.

g. Monitor incident operations to identify current or potential interorganizational issues and advise Incident Command, as appropriate.

h. Participate in planning meetings, provide current resource status information, including limitations and capabilities of assisting agency resources.

i. Provide information and support to local government officials and stakeholder groups.

j. Maintain Unit/Activity Log (ICS 214).

***Information Officer*** – The Information Officer is responsible for developing and releasing information about the incident to the news media, to incident personnel, and to other appropriate agencies and organizations. Only one Information Officer will be assigned for each incident, including incidents operating under Unified Command and multi-jurisdictional incidents. The Information Officer may have assistants, as necessary, and the assistants may also represent assisting agencies or jurisdictions.

a. Review Common Responsibilities.

b. Determine from the Incident Commander if there are any limits on information release.

c. Develop material for use in news briefings.

d. Obtain Incident Commander approval for news media releases.

e. Inform news media and conduct news briefings.

f. Arrange for tours and other interviews or briefings that may be required.

g. Obtain news media information that may be useful for incident planning.

h. Maintain current information summaries and/or displays on the incident.

i. Provide information on status of incident to assigned personnel.

j. Establish and staff a Joint Information Center (JIC), as necessary.

k. Maintain Unit/Activity Log (ICS 214).

***Safety Officer*** – The Safety Officer is responsible for monitoring and assessing hazardous and unsafe situations and developing measures to assure personnel safety. The Safety Officer will correct unsafe acts or conditions through the regular line of authority, although the Safety Officer may exercise emergency authority to prevent or stop unsafe acts when immediate action is required. The Safety Officer maintains awareness of active and developing situations, ensures the Site Safety and Health Plan is prepared and implemented, and includes safety messages in each Incident Action Plan. Only one Safety Officer will be assigned for each incident, including incidents operating under Unified Command and multi-jurisdiction incidents. The Safety Officer may have assistants, as necessary, and the assistants may also represent assisting agencies or jurisdictions.

a. Review Common Responsibilities.

b. During initial response, document the hazard analysis process addressing hazard identification, personal protective equipment, control zones, and decontamination area.

c. Participate in planning meetings to identify any health and safety concerns inherent in the operations daily work plan.

d. Review the Incident Action Plan for safety implications.

e. Exercise emergency authority to prevent or stop unsafe acts.

f. Investigate accidents that have occurred within incident areas.

g. Ensure preparation and implementation of Site Safety and Health Plan (SSHP) in accordance with the Area Contingency Plan (ACP) and state and Federal OSHA regulations. The SSHP shall, at a minimum, address, include, or contain the following elements:

- Health and safety hazard analysis for each site task or operation.
- Comprehensive operations work plan.
- Personnel training requirements.
- PPE selection criteria.
- Site-specific occupational medical monitoring requirements.
- Air monitoring plan: area/personal.
- Site control measures.
- Confined space entry procedures "only if needed".
- Pre-entry briefings (tailgate meetings): initial and as needed.
- Pre-operations health and safety conference for all incident participants.
- Quality assurance of SSHP effectiveness.

h. Assign assistants and manage the incident safety organization.

i. Review and approve the Medical Plan (ICS 206).

j. Maintain Unit/Activity Log (ICS 214).

***NRDA Representative*** - The Natural Resource Damage Assessment (NRDA) Representatives are responsible for coordinating the NRDA needs and activities of the trustee team. NRDA activities generally do not occur within the structure, processes, and control of the Incident Command System. However, particularly in the early phases of a spill response, many NRDA activities overlap with environmental assessment performed for the sake of spill response. Because NRDA is carried out by natural resource trustee agencies and/or their contractors, personnel limitations may require staff to perform both NRDA and response activities simultaneously. Therefore, NRDA representatives should remain coordinated with the spill response organization through the Liaison Officer, and may need to work directly with the Unified Command, Environmental Unit, Wildlife Branch or the NOAA Scientific Support Coordinator to resolve any problems or address areas of overlap. While NRDA resource requirements and costs may fall outside the responsibility of the Logistics and Finance/Admin sections, coordination is important.

***Legal Officer*** – Provides advice on all aspects of an oil spill incident. Ensures that information which may be relevant to the defense and/or settlement of future claims is gathered and preserved.

(b) (7)(F) [redacted]

***Staff Assistants*** – Support the Incident Commander and his team by performing administrative duties such as photocopying, errands, taking notes, etc.

## OPERATIONS SECTION

***Operations Section Chief*** – The Operations Section Chief, a member of the General Staff, is responsible for managing all operations directly applicable to the primary mission. The Operations Section Chief activates and supervises elements in accordance with the Incident Action Plan and directs its execution; activates and executes the Site Safety and Health Plan; directs the preparation of unit operational plans; requests or releases resources; makes expedient changes to the Incident Action Plans as necessary; and reports such to the Incident Commander.

a. Review Common Responsibilities.

b. Develop operations portion of Incident Action Plan.

c. Brief and assign operations personnel in accordance with Incident Action Plan.

d. Supervise execution of the Incident Action Plan for Operations.

e. Request resources needed to implement Operation's tactics as part of the Incident Action Plan development (ICS 215).

f. Ensure safe tactical operations.

g. Make, or approve, expedient changes to the Incident Action Plan during the operational period, as necessary.

h. Approve suggested list of resources to be released from assigned status (not released from the incident).

i. Assemble and disassemble teams/task forces assigned to operations section.

j. Report information about changes in the implementation of the IAP, special activities, events, and occurrences to Incident Commander as well as to Planning Section Chief and Information Officer.

k. Maintain Unit/Activity Log (ICS 214).

***Air Ops Branch*** – Responsible for preparing the air operations portions of the Incident Action Plan. The plan reflects Company or Agency restrictions that have an impact on the operations capability of utilization of resources.

***Operations Specialist*** – Assists and provides information for field operations as chief.

***Field Supervisors*** – Responsible for the implementation of the assigned portion of the Incident Action Plan, assignment of resources within the progress of control operations, and the status of resources.

## PLANNING SECTION

***Planning Section Chief*** – The Planning Section Chief, a member of the General Staff, is responsible for collecting, evaluating, disseminating, and using information about the incident and status of resources. Information is needed to: 1) understand the current situation, 2) predict probable course of incident events, and 3) prepare alternative strategies for the incident.

a. Review Common Responsibilities.

b. Activate Planning Section units.

c. Assign available personnel already on site to ICS organizational positions, as appropriate.

d. Collect and process information about the incident.

e. Supervise Incident Action Plan preparation.

f. Provide input to the Incident Command and Operations Sections Chief in preparing the Incident Action Plan.

g. Participate in planning and other meetings, as required.

h. Establish information requirements and reporting schedules for all ICS organizational elements for use in preparing the Incident Action Plan.

i. Determine need for any specialized resources in support of the incident.

j. Provide Resources Unit with the Planning Section's organizational structure, including names and locations of assigned personnel.

k. Assign Technical Specialists, where needed.

l. Assemble information on alternative strategies.

m. Assemble and disassemble Strike Teams or Task Forces, as necessary.

n. Provide periodic predictions on incident potential.

o. Compile and display incident status summary information.

p. Provide status reports to appropriate requesters.

q. Advise General Staff of any significant changes in incident status.

r. Incorporate the incident Traffic Plan (from Ground Support Unit), Vessel Routing Plan (from Vessel Support Unit) and other supporting plans in the Incident Action Plan.

s. Instruct Planning Section Units in distribution and routing of incident information.

t. Prepare resource release recommendations for submission to Incident Command.

u. Maintain Section records.

v. Maintain Unit/Activity Log (ICS 214).

***Resources Unit*** – Responsible for the establishing all check-in activities; preparation and maintenance of displays, charges, and lists that reflect current status; the preparation and processing of resources status change information and the location of incident resources.

***Situation Unit*** – Collects and organizes spill status and situation information. Responsible for the evaluation, analysis, and display of that information.

***Documentation Unit*** – Maintains accurate and complete historical files, and provides duplicating services and stores incident files for legal, analytical, and historic purposes.

***Environmental Unit*** – Determines extent of environmental damage and evaluates the effects of clean up methods on the environment; obtains necessary permits, coordinates with government agencies to arrange for disposal of recovered oil and waste, and implements wildlife protection and treatment plans.

***Technical Specialist*** – Advisors with special skills needed to support incident options. They may report to the Planning Section Chief; may function within an existing unit such as the situation unit; form a separate unit if required; or be reassigned to other parts of the organization. Filled by contract services personnel.

## LOGISTICS SECTION

***Logistics Section Chief*** – The Logistics Section Chief, a member of the General Staff, is responsible for providing facilities, services, and material in support of the incident response. The Logistics Section Chief participates in developing and implementing the Incident Action Plan and activates and supervises Branches and Units within the Logistics Section.

a. Review Common Responsibilities.
b. Plan organization of Logistics Section.
c. Assign work locations and preliminary work tasks to Section personnel.
d. Notify Resources Unit of Logistics Section units activated including names and locations of assigned personnel.
e. Assemble and brief Branch Directors and Unit Leaders.
f. Participate in Incident Action Plan preparation.
g. Identify service and support requirements for planned and expected operations.
h. Provide input to, and review, Communications Plan, Medical Plan, Traffic Plan, and Vessel Routing Plan.
i. Coordinate and process requests for additional resources.
j. Review Incident Action Plan and estimate Section needs for next operational period.
k. Advise on current service and support capabilities.
l. Prepare service and support elements of the Incident Action Plan.
m. Estimate future service and support requirements.
n. Provide input to Demobilization Plan as required by Planning Section.
o. Recommend release of unit resources in conformance with Demobilization Plan.
p. Ensure general welfare and safety of Logistics Section personnel.
q. Maintain Unit/Activity Log (ICS 214).

***Supply Unit*** – Responsible for ordering personnel, equipment, and supplies; receives and stores supplies; maintains inventories and distributes supplies as requested.

***Facilities Unit*** – Provides for office work areas, living quarters and storage buildings; provides sanitation facilities, manages remote camps and general maintenance to facilities.

***Ground Support Unit*** – Provides for transportation of personnel, supplies, food and equipment; performs fueling, service and repair work to vehicles and other ground support equipment; implements traffic plan for the incident.

***Medical Unit***– Develops a Medical Emergency Plan and renders medical aid for injured and ill personnel assigned to the spill.

***Food Unit*** – Determines feeding requirements at all spill locations and facilities; provides drinking water and contractor oversight.

***Comms Unit*** – Develops plans for the effective use of spill communications equipment and facilities; installs and tests equipment and operates an Incident Communications Center.

***Radio Dispatch*** – Maintains communication links between command post and filed supervisors. Provide for recording of all communications and routing of hard copy to required parties.

## FINANCE/ADMINISTRATION SECTION

***Finance/Administration Section Chief*** – The Finance/Administration Section Chief, a member of the General Staff, is responsible for all financial and cost analysis aspects of the incident and for supervising members of the Finance/Administration Section.

a. Review Common Responsibilities.
b. Attend briefing with responsible company/agency to gather information.
c. Attend planning meetings to gather information on overall strategy.
d. Determine resource needs.
e. Develop an operating plan for Finance/Administration function on incident.
f. Prepare work objectives for subordinates, brief staff, make assignments, and evaluate performance.
g. Inform members of the Unified Command and General Staff when Section is fully operational.
h. Meet with assisting and cooperating company/agency representatives, as required.
i. Provide input in all planning sessions on financial and cost analysis matters.
j. Maintain daily contact with company/ agency(s) administrative headquarters on finance matters.
k. Ensure that all personnel time records are transmitted to home company/agency according to policy.
l. Participate in all demobilization planning.
m. Ensure that all obligation documents initiated at the incident are properly prepared and completed.
n. Brief agency administration personnel on all incident related business management issues needing attention and follow-up prior to leaving incident.

***Time/Cost Unit*** – Provides time/cost reporting of labor, materials and supplies used during spill containment and repair.

***Procurement Unit*** – Administers and establishes, as necessary, vendor contracts for operations support-related supplies, services, and technical consultants.

***Insurance Unit*** – Initiates investigation and documentation on all claims other than personal injury and arranges for damage surveyors and adjusters.

### 1.5.2 Government Agencies

The USCG and EPA are the lead agencies and pre-designated Federal On-Scene Coordinators (FOSC) for oil spill response activities as established by the *National Contingency Plan*. The EPA has primary responsibility for spills that occur on inland U.S. waters not under USCG jurisdiction, and all spills on land.

In the event of a major spill, an FOSC will be designated. The FOSC for the North Dakota Response Zones will be an EPA representative. The FOSC will facilitate communications with federal, state, and local government agencies that will be involved in response operations. The primary responsibility of the FOSC, as defined in 40 CFR, Part 300 (*National Oil and Hazardous Substance Contingency Plan*), is to direct the efforts of government agencies during a spill emergency.

The FOSC may receive advice from the Regional Response Team (RRT). The RRT, which is comprised of representatives of federal/state agencies, has been established to provide the FOSC with technical and professional assistance.

Special pollution control forces and teams have been assembled to enhance the ability of the FOSC and RRT to respond to major oil spills. The Scientific Support Team, under the direction of the Scientific Support Coordinator, provides information on spill trajectories and critical habitats. The USCG Strike Teams have air-deployable equipment and experienced operators to respond to major spills. The National Strike Force totals over 200 active duty, civilian, and reserve personnel and includes the National Strike Force Coordination Center (NSFCC) in Elizabeth City, NC; the Atlantic Strike Team in Ft. Dix, NJ; the Gulf Strike team in Mobile, AL; the Pacific Strike Team in Novato, CA; and the Public Information Assist Team (PIAT) located at the NSFCC.

The FOSC is authorized to determine the adequacy of the private cleanup efforts. If efforts are determined inadequate or ineffective, the FOSC may assume control of the cleanup.

Air, ground and vessel traffic control will be managed by the respective federal, state or local agencies including the Federal Aviation Agency (FAA), USCG and local police/sheriff departments. A private security service may be contracted to assist in site security and traffic control.

## 1.6 RESPONSE STRATEGIES

In the event an oil spill occurs from the pipeline, a response effort will be initiated as rapidly as possible. This section provides information to aid in the assessment of the spill's magnitude and the selection of appropriate response strategies. Additional information regarding response strategy/techniques and maps is provided in Part 2 of this plan. The sequence of response activities will generally follow those presented in the Response Decision Diagram shown in Figure 1.6-1.

### Personnel Safety

While Tesoro recognizes the importance of responding rapidly to an oil spill incident, personnel safety is always accorded the highest priority during response operations activities. To ensure personnel safety, the following guidelines will be observed:

1. Deployment of equipment will not be attempted when the threat of fire or explosion exists.

2. Deployment of equipment will not be attempted when flammable vapors are present or suspected, and action will not be taken until the vapors in the surrounding area have been reduced to a safe level (i.e., less than 10 percent of the lower explosive limit [LEL]).

3. Deployment of equipment will not be initiated until all personnel involved in deployment operations are wearing the required protective clothing.

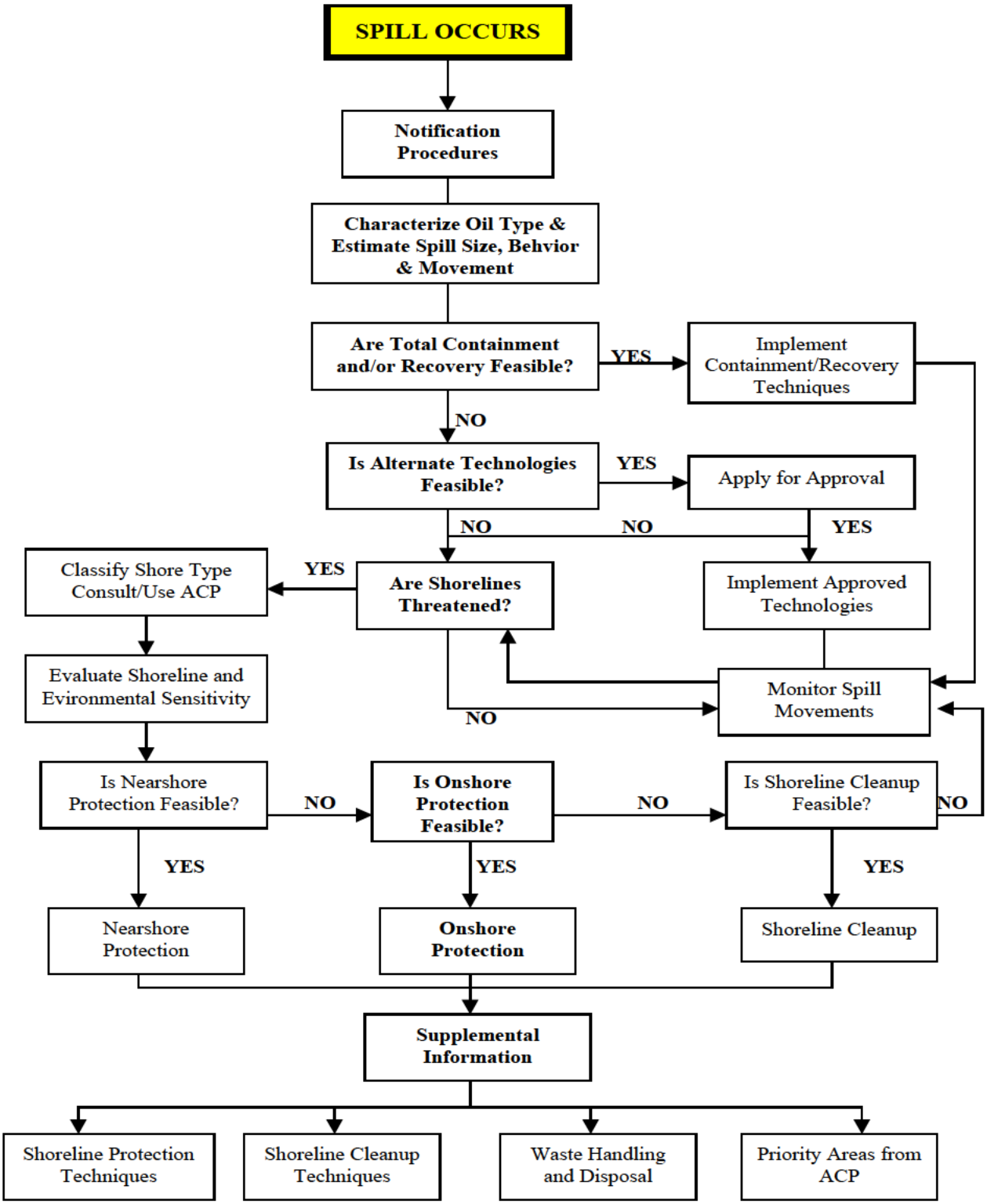
### Protection Priorities

To the degree possible, all threatened resources will be protected. Where time or resources will not permit response to all situations (such as in major spills), the Protection Guides (presented in Section 2.1) may be used to delegate efforts for maximum resource protection on a day-to-day basis in response to events as they unfold in the field.

In cases where resources have not yet been impacted, the setting of response priorities based on spill movement, identification of sensitive areas, and consideration of the feasibility of protective actions is relatively straight-forward. When available response time permits, sensitive areas that can reasonably be protected should be treated in the order of relative sensitivity or vulnerability.

In cases where resources have already been impacted and continued oiling is anticipated, priority judgments become less clear. Generally, if a highly sensitive and/or vulnerable resource has been only lightly oiled, its normal response priority should be maintained. If such a resource has been heavily oiled and a resource of similar value is threatened, response priority should shift to the yet unoiled resource.

**Figure 1.6-1**
**Response Decision Diagram**



## Environmental Controls for Cleanup Activities

Environmental controls should be implemented when selecting and implementing oil spill containment and recovery techniques. To protect environmental resources from adverse impact from cleanup activities, the following guidelines should be used:

1. Cleanup activities on streams and banks of streams will be avoided, unless specifically approved by the appropriate government agencies.
2. Cleanup techniques that dislodge riparian vegetation and associated invertebrates will be avoided, unless specifically approved by government agencies.
3. Cleaning of marshes or vegetated shorelines will be avoided, unless specifically approved by government agencies.
4. Unaffected areas adjacent to shoreline cleanup areas will be boomed off to protect them from oiling during treatment operations.
5. Impact to lower emergent vegetation areas that are productive and not oiled will be minimized.
6. Sorbents will be employed below oiled upper beach faces to protect emergent vegetation from oiling.
7. All signs of human activity will be removed upon completion of cleanup.

All post-emergency response cleanup activities by Tesoro will be in accordance with those given in an approved Incident Action Plan. The Shoreline Countermeasures Manual, and matrices presented in the ACP, as well as the NOAA/API document *Inland Oil Spills: Options for Minimizing Environmental Impacts of Freshwater Spill Response* should be consulted in determining appropriate shoreline cleanup techniques.

## Description and Location of Emergency Shutdown System

(b) (7)(F) [redacted]

## Incident Categorization

Incidents are classified as described below. Generally, the classifications are based on the severity of the incident as determined by the Incident Commander.

Tesoro operates a pipeline system, terminal/tank farm storage facilities and truck transportation system. Each of these modes of operation are faced with unique situations and/or potential incidents. As such, the classification system uses common terminology and categorizes the various hazards commonly faced by the company in order to provide a flexible framework for determining the severity of the incident and appropriate response.

Various data are considered when determining the appropriate emergency classification. These data include, but are not limited to:

- Initiating Event:

  Natural Disaster; Operational, Mechanical, System; Human Error

- Safety:

  Injuries/Fatalities

- Protective Actions:

  Evacuation, Sheltering, Personal Protective Equipment

- Surroundings:

  Community: Residential, Industrial, Commercial, Rural

- Proximity to:

  Highways, Railroads, Power Lines, Rivers or Streams, Other Waterways or Watersheds, Combustible Environments

- Commodity:

  Material: HVLs, Gasoline, Chemicals, CO2, Distillate, Crude Oil

- Plume Location:

  Concentration, Potential to affect sensitive areas or populations

- Quantity:

  Reportable Quantity, Amount Spilled, Movement/Containment of released materials

- Weather:

  Wind Velocity, Cloud Cover, Seasonal Factors, Precipitation, Fog

- Actions Taken:

  Emergency Response Organization, Emergency Management Organization (Pipeline Team), Other Tesoro Resources activated; Non-Tesoro Resources (Police, Fire, Regulatory Agencies) activated; Private Contractors, Consultants, Technical Experts activated. Pipeline operations suspended/shutdown and locked in.

- Capability:

  Organization Response Level: Emergency Response Organization (Pipeline Team). Other Tesoro/Non-Tesoro Resources involved.

Table 1.6-1 presents the criteria used to help determine the classification level.

**Table 1.6-1**
**Incident Classification**

| **MINOR INCIDENT** |
|---|
| Incident Command will normally be assumed by Pipeline Management. Tesoro Corporate Resources support will be utilized on an as needed basis. |
| **Exposure** |
| The potential Public and Environmental exposure is moderate. The type and quantity of material released, while considering the overall nature of the incident (e.g. fire, proximity to private dwellings, etc.), will have moderate impact on the public and/or the environment.<br>Minor incidents generally include occurrences such as:<br>• Oil spills onto pavement or impervious containment that are not greater than the portable spill retrieval equipment on-site.<br>• Oil spills onto gravel or native soil that are less than Reportable Quantities and are not believed to directly threaten groundwater.<br>• Oil spills to water that are readily corrected by self-deployed spill pads and sorbents. |
| **Degree of Control** |
| The incident can be controlled in a short period of time through implementation of the local resources available to the facility (including contract resources). |
| **Governmental Involvement** |
| Government involvement will be moderate and generally restricted to State and Local levels. |
| **Media Involvement** |
| Media interest will be moderate and generally restricted to State and Local Levels. |

**Table 1.6-1 (*continued*)**
**Incident Classification**

| **SERIOUS INCIDENT** |
|---|
| Local Tesoro resources may have to be supplemented with Incident Management Team (IMT) resources to manage the spill incident. |
| **Exposure** |
| The potential Public and Environmental exposure is moderately high. The type and quantity of material released, while considering the overall nature of the incident (e.g., fire, proximity to private dwellings, etc.), will have moderately high impact on the public and/or the environment.<br>Serious environmental incidents include:<br>• Oil spills that require OSRO participation and skimming equipment deployment.<br>• Oil spills or chemical releases that have or will likely result in significant interest by the regulatory agencies. Significant regulatory interests include NOVs or citations issued on-site and/or regulatory personnel requesting additional personnel from the same or other regulatory jurisdictions.<br>• Oil spills or chemical releases that have or will likely result in significant interest by the press. This includes the arrival of radio, newspaper or television press personnel at the scene, or a subsequent request for a detailed telephone interview on the incident.<br>• Oil spills that have directly impacted or oiled wildlife.<br>• Chemical releases resulting in on-site evacuations.<br>• Chemical releases resulting in off-site impacts, shelter-in-place notifications or evacuations. |
| **Degree of Control** |
| The incident can be brought under control in a moderate period of time through implementation of local resources available to the facility (including contract resources) with possible implementation of regional resources. |
| **Governmental Involvement** |
| Government involvement will be moderately high and generally restricted to Regional levels. |
| **Media Involvement** |
| Media Interest will be moderately high and generally restricted to Regional levels. |

**Table 1.6-1 (*continued*)**
**Incident Classification**

| **MAJOR INCIDENT** |
|---|
| Maximum Tesoro and external resources must be implemented to respond to the spill incident. Activation of the Tesoro Response Team would be anticipated during a major incident. |
| **Exposure** |
| The potential Public and Environmental exposure is significant. The type and quantity of material released, while considering the overall nature of the incident (e.g. fire, proximity to private dwellings, etc.), will have significant impact on the public and/or the environment. |
| **Degree of Control** |
| Maximum Tesoro and third party resources must be implemented in order to gain control of the incident. |
| **Governmental Involvement** |
| Government involvement will be intense. |
| **Media Involvement** |
| Media interest will be intense. |

## Initial Response Actions – Minor Spills

### Aquatic

In the event of a minor aquatic spill, the Tesoro Incident Commander will activate response contractors. The following procedures will apply:

1. Shutdown pipeline operations to minimize spill volume and impacts.
2. For minor spills emanating from the pipeline, contractors will:
   - Launch response boat and containment boom, and deploy boom.
   - Deploy additional boom as necessary to ensure oil does not escape.
   - Deploy recovery equipment at downstream corner of containment area to recover floating oil and use sorbent pads for sheen recovery.
   - Maintain cleanup operations until no visible sheen is apparent.
3. For other minor spills (uncontained):
   - Alert primary response contractor immediately. Request additional equipment and personnel if available containment and recovery equipment may not be sufficient.
   - Launch response boat and pull containment boom into water.
   - Deploy boom around the oil slick or in front of the leading edge to contain all or as much of the oil as possible.
   - Bring boom ends together and begin recovering oil with recovery equipment and/or sorbent pads.
   - If all or part of the spill is still not contained, assess wind and current direction to determine the probable trajectory of the slick (see Section 1.6.3).
   - Direct primary response contractor to implement containment and recovery operations (see Section 1.6.5) to control remaining oil or protection operations per the ACP if it appears oil cannot be contained prior to contacting a sensitive area (see Section 1.6.6).
   - Utilize primary response or other oil spill contractors to provide rapid and complete cleanup of the spill.

## Terrestrial

In the event of a minor terrestrial spill that, in the opinion of the Incident Commander, can be adequately contained and clean up with in-house equipment and personnel, the following procedures will apply:

1. Ensure personnel safety (see Section 1.3).
2. Stop the flow of the spill.
3. Begin the necessary containment and cleanup procedures (see Section 1.6.5). Use Response Contractor to implement the necessary techniques to limit the spread of oil.

## Initial Response Actions – Major Spills

A major spill, for Tesoro's purposes, is one that cannot be contained or managed using only onsite and primary response contractor equipment and personnel. In this case, the Incident Commander will immediately request the assistance of the Tesoro Spill Management Team and primary resource contractors. The initial response actions to be taken for major aquatic and terrestrial spills are as follows.

## Aquatic

The initial response actions implemented by the local Immediate Response Team (IRT) in the event of a major spill will focus primarily on personnel safety, controlling the spill near its source, and providing the first line of defense until outside resources arrive. The procedures the Incident Commander should consider are listed below in the recommended order of implementation.

1. Ensure personnel safety (see Section 1.3).
2. Stop the flow of oil at the source.
3. Initiate slick surveillance and tracking procedures (see Section 1.6.3).
4. Request assistance from Tesoro Spill Management Team and primary response and other contractors, as necessary (see Section 1.2).
5. Deploy the available boom downstream of the source and/or in front of the slick's leading edge to contain as much of the oil as possible (see Section 1.6.5).
6. If the spill is continuing, anchor the boom in place and use a skimmer to begin recovering oil as it becomes contained by the boom (see Section 1.6.5).
7. If the spill is not continuing, recover the contained oil as soon as possible by skimming or with sorbents (see Section 1.6.5) and redeploy the boom to contain additional oil or protect sensitive areas as outlined in the ACP (see Section 1.6.6 and ACP).
8. Estimate the probable spill trajectory (see Section 1.6.3) and identify the sensitive areas at risk (see Section 1.6.6) per the ACP.

9. Using the ACP and Part 2 of this Plan, determine a strategy for exclusionary, diversionary, and collection booming.
10. Continue to monitor spill movement and begin developing an overall spill response plan in conjunction with the FOSC/SOSC.
11. Set up interim waste storage sites and begin making arrangements for waste characterization and disposal (see Section 1.7 and Appendix B).

**Terrestrial**

The immediate response procedures implemented by the IRT in the event of a major terrestrial spill will focus primarily on personnel safety, limiting the spread of oil, and preventing any offsite migration. The Incident Commander should consider the procedures listed below in the recommended order of implementation.

1. Ensure personnel safety (see Section 1.3).
2. Eliminate sources of ignition.
3. Evacuate the area if extreme fire or explosion hazard exists; notify local police, fire department, and Tesoro Spill Response Team (see Section 1.3.3).
4. If safe, stop the flow of oil at the source.
5. If spill is within a containment area, block storm drains and construct containment and/or diversion berms to limit the spread of oil and direct the flow to natural depressions or containment areas.
6. If spill is outside of a containment area, implement containment techniques to limit the spread of oil and prevent oil from entering the water (see Section 1.6.5).
7. Request assistance from Tesoro Spill Management Team, primary response, and other contractors as needed (see Section 1.2).
8. Begin recovering contained oil immediately by pumping, using vacuum trucks and/or sorbents to minimize penetration into the substrate (see Section 1.6.5).
9. Set up interim waste storage site(s) and begin making arrangements for waste characterization and disposal (see Section 1.7 and Appendix B).

## Major Spill Plan Implementation

In the event of a major spill, Tesoro must implement this OSCP to the full extent including the activation of the Tesoro Spill Management Team and a number of response/support service contractors. At this point, the Incident Command post may be moved to another suitable location. In addition to the immediate response procedures discussed above, other key initial actions that should be taken when responding to a major spill are outlined below.

1. Establish a Command Post – If the majority of the spill activities are conducted at some distance, a mobile command post may also be established at a more central location using trailers. Section 1.6.4 provides criteria for establishing a Command Post.

2. Establish Communications Systems – Refer to information provided in Section 1.4 of the OSCP for communications information including radio and telephone lines.

3. Site Control and Access – The local sheriff/police department or security service should be contacted to cordon off spill area and allow access to authorized personnel only. Photo identification badges should be issued to all response workers but with an easily identifiable differentiation between Tesoro and contractor personnel.

4. Logistical Support – Arrangements for housing, transportation, meals, supplies, and other logistical support should be initiated for response and support personnel anticipated to be involved in the spill response. The Local Emergency Planning Committee (LEPC) should be consulted to assist in these arrangements.

5. Waste Management – Establish a system for the handling, transport, temporary storage, characterization, and disposal of liquid/solid wastes generated by the spill response. Interim waste storage sites should be identified and constructed, equipment and personnel should be acquired and designated to handle and transfer wastes from the recovery points to the waste storage sites. Potential waste disposal/treatment sites should be identified along with their waste acceptance criteria and profile requirements. Section 1.7 provides information on waste management. The Waste Disposal Plan is presented in Appendix B.

6. Government and Public Liaison – Establish a plan and designate personnel to coordinate and maintain communications with response contractors, government agencies, the media, and the public.

7. Public Information – Use the news media to distribute information regarding the nature of the incident and actions underway to mitigate the impacts. A successful response often depends on timely and accurate public information.

8. Equipment Staging Area(s) – Establish areas adjacent to the spill site for equipment staging and deployment. Additional information is provided in Section 1.6.4.

## Climatic and Hydrographic Conditions

The prevailing climatic and hydrographic conditions at the time of a spill can influence a variety of response factors and should be quantified to the extent practical and as soon as possible following the discovery of a spill. Key climatic and hydrographic conditions and affected response factors are:

- Wind speed and direction – Aquatic spill trajectories, vapor plume dispersions, boom deployment, technique effectiveness, vessel and aircraft safety, and others.

- Current speed and direction – Aquatic spill trajectories, boom deployment, technique effectiveness, shoreline access restrictions, and others.

- Visibility – Spill movement tracking and surveillance and aircraft and vessel safety.

- Temperature – Spill volatility, worker productivity and safety, equipment effectiveness, and others.

Wind speed and direction may need to be approximated using best judgment. If an accurate estimate is required, contact the National Weather Service (see Section 1.2).

Current speeds and directions may need to be estimated at the time of the spill by pacing off a 100-foot section of shoreline, throwing a stick or orange into the water upstream, and timing how long it takes the stick/orange to traverse the 100-foot area. The direction of stick/orange movement will also approximate the surface current direction combined with the effects from local winds, if present. The time required (in seconds) for the stick/orange to move 100 feet is divided into 100 to estimate current speed in feet per seconds (fps). The resulting fps is then multiplied by 0.5921 to convert the speed into knots. Selected conversions are provided below.

- 0.25 knots = 240 seconds/100 feet (0.42 fps)
- 0.5 knots = 120 seconds/100 feet (0.83 fps)
- knots = 60 seconds/100 feet (1.67 fps)
- 1.5 knots = 40 seconds/40 feet (2.5 fps)

Visibility is determined by visual estimates concerning both the horizontal and vertical distances within which objects are clearly visible. The vertical visibility (or ceiling) is typically limited by low cloud cover or overcast conditions but can also be dramatically reduced by heavy fog. Lateral visibility is influenced by fog or heavy rain or snow. In general, normal aircraft operations are restricted to ceilings greater than 500 feet and horizontal visibility in excess of 0.5 miles. Vessel operations are not affected by ceilings but should be discontinued when horizontal visibility is less than a few hundred feet.

Temperature can be determined using an outdoor thermometer or by calling the local weather service or airport. Only temperatures below freezing or above 80 to 90° are of concern to oil spill response operations. Temperatures above or below this range can adversely affect productivity and the health and safety of response personnel.

The temperature gradient between the northwestern and southeastern corners of the state of Minnesota has a maximum intensity in January, with a difference of 16°F (mean average). The difference is nearly as great in June because Lake Superior greatly depresses the temperature along its margin. The least difference across the state occurs in September and October with only 7 to 8°F separating the northern and southern boundaries.

Winters are moderately long and somewhat severe, but more than 120 days have temperatures above 50°F. The frost-free season lasts from 100 to 140 days. Snow usually stays on the ground all winter and on average soils initially freeze in late November, early December. The average annual precipitation is moderate, ranging from 24 to 45 inches. Maximum precipitation comes in the summer months.

In the event of a spill, Tesoro Spill Management Team will assess the potential impact of weather using NOAA forecasts for regional information, local forecasts from the National Weather Service, and/or actual field weather conditions.

Additional real time weather information can be found at the following web sites:

- www.wx.com/wxradar
- http://iwin.nws.noaa.gov/iwin/iwdspg1.html
- http://climate.umn.edu/
- www.ktig.org/weather

### 1.6.1 Estimating Volume of Spill on Water

In the event of a sizable spill, a rough estimate of the spill's total volume provides the Incident Commander (IC) with preliminary data to plan and initiate the cleanup response. Generating this estimate early in the spill response aids in determining:

- The equipment and personnel needed.
- The amount of oil that may reach shorelines and/or sensitive areas.
- The requirements for temporary storage and disposal of recovered materials.

A rough estimate of spill volume can be generated from observations of the oil slick's size and thickness. As time passes, the oil will spread and the thickness of the slick will decrease. Figure 1.6-2 provides a method for estimating the volume of a spill based on the appearance of the slick. With slick thickness greater than 0.25 millimeters (mm), it is preferable to obtain direct measurements of slick parameters, when feasible.

A secondary method of visual estimation can be performed by analyzing the color and size of the slick and converting that data with the information provided in Figure 1.6-3.

### Basic Definitions

**Sheen:** The oil is visible on the water as a silvery sheen or with tints of color (rainbow colors). This is the thinnest thickness of an oil.

**Dark Colors:** The oil is visible with dark colors; it will still have traces of the rainbow colors but is not black or dark brown.

**Black/Dark Brown:** Fresh oil after the initial spreading will have a black or very dark brown color. This is the greatest thickness of non-emulsified oil.

**Mousse:** This is a water-in-oil emulsion which is often orange to rust colored. Mousse is very thick and viscous and may contain about 30 percent oil.

## Spill Factors

The factors listed in Table 1.6-1 may be used to estimate the volume of oil contained in a spill unless a more accurate amount is known by other means. Whenever possible, these factors should be compared to volumes estimated from the source of the spill (e.g., piping volume, sump volume, tank capacity, or compartment size). Exact calculations of the volume of a spill are not possible by visual observations of the oil on the surface of the water. For this reason, the spill volumes should be rounded off to avoid the appearance of a very accurate determination.

a) Estimate dimensions (length and width) of each part of the spill in yards or nautical miles (2,000 yards) for each of the four appearances that may be observed in the spill. Multiply length times width to calculate the area covered by sheen, by dark colors, by black/brown oil, and mousse.

b) Multiply each of the areas calculated in Step a) by the appropriate factor from Table 1.6-2. Add the individual parts together. The answer is the estimated volume of the spill in gallons or in barrels (bbls) of oil. Spills that are calculated to be less than 1 gallon should be reported as "less than 1 gallon," rather than the decimal amount. Round off the volume to the nearest gallon or 0.1 bbl for spills less than 7 bbls. For spills larger than 7 bbls, round off to the nearest barrel or to no more than two significant figures (i.e., 637 bbls would be reported as 640 bbls). Generally, any volume less than 1 bbl should be reported in gallons.

c) As an alternative to using the factors, the slick volume estimator graphs (see Figures 1.6-2 and 1.6-3) may be used to read the spill volume directly once the area has been determined.

**Table 1.6-2**
**Spill Factors**

| APPEARANCE OF OIL ON WATER (This gives the thickness of oil) | ASSUMED THICKNESS (mm) | FACTOR | |
|---|---|---|---|
| | | Gallons/Sq. Yd. | bbls/Sq. NM. |
| Sheen (silver or with colors) | 0.0003 | 0.000066 | 6.3 |
| Dark Colors | 0.002 | 0.00044 | 42.0 |
| Black/Dark Brown | 0.1 | 0.022 | 2,100.0 |
| Mousse (note: 30% oil) | 1.0 | 0.066 | 6,300.0 |

**Figure 1.6-2**
**Volume and Slick Estimation**

**Figure 1.6-3**
**Oil Slick Volume Estimator (Barrels)**

**Example: Estimating Volume of Spill on Water**

A spill has created a sheen with rainbow colors that is estimated to be one nautical mile long (2,000 yards) by an average of 30 yards wide. There is a second area of black oil that is 60 yards wide by 200 yards long.

Note that almost all of the oil is contained in the black appearing area; containment and cleanup should be concentrated on such areas.

| | |
|---|---|
| Area One Volume | = 2,000 yds. x 30 yds. x 0.000066 gal./sq. yd.<br>= 3.96 gallons; round off to 4 gallons |
| Area Two Volume | = 200 yds. x 60 yds. x 0.022 gal. sq. yd.<br>= 264 gallons |
| Total Volume | = Area One + Area Two<br>= 4 + 264<br>= 268 gallons |
| Volume in Barrels | = 268/42<br>= 6.38 bbls; round off to 6.4 bbls |

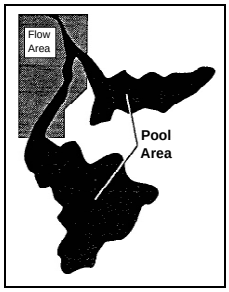
## 1.6.2 Estimating Volume of Spill Onshore

Oil spills on land are often as difficult to size as those offshore. A reasonably close estimate can be obtained by determining the area covered, average depth, and average penetration into the soil.

### Classifying the Areas

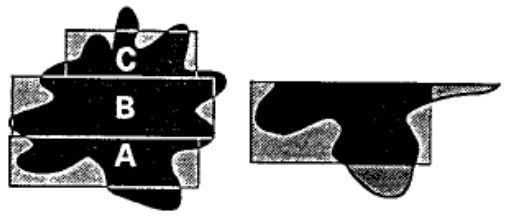
The surface of spilled oil is usually so irregular that it is extremely difficult to estimate the area covered. The problem can be simplified if the spill area is first separately divided into two main types of areas:

- Flow Areas
  Area covered by oil flow with little or no penetration.
- Pooling Areas
  Area where oil has pooled after flowing, allowing penetration to occur.



## Converting Irregular Shapes (Simpson's Rule)

In order to estimate the area of an irregular shape, the shapes can be converted into a series of rectangles that approximate the area of the irregular shape, with about the same amount of spill area outside of the rectangle as there is dry area inside the rectangle. This can be done by stretching a steel tape along the ground outside the spill area. The area can then be quickly estimated by multiplying the length of the sides.




| | |
|---|---|
| Area "A" 70' x 20' = | 1,400 square feet |
| Area "B" 60' x 10' = | 600 square feet |
| Area "C" 35' x 20' = | 700 square feet |
| | **2,700 square feet total** |

The more rectangles you use, the more accurate the estimate becomes.

## Estimating the Average Depth

The next task is to estimate the average depth of oil in each of the areas. The oil will vary from very shallow at the edge to whatever depth the terrain is at the lowest point. This can be determined by "gauging" with a stick if it is shallow or accessible. If the pool is wider, you can heave a large stone into the pool to confirm depth. A good estimate can usually be made by observing the slope of the ground around the pool and assuming that the slope continues under the surface of the oil.

If you estimate that the deepest point in Area "A" is 20 inches and Area "A" has three boundaries of "shore," divide the depth figure by three to obtain average depth. If it has two "shore" boundaries, like Area "B," divide the depth by two to obtain average area depth.

## Obtaining the Free Oil Volume

The irregular shaped area with unseen bottom has now been reduced to familiar shapes. The volume of free oil in Area "A" is:

Area "A": 70' x 20' = 1,400 square feet

Average depth = 20" ÷ 3 ≈ 7"

7 inches ÷ 12 inches per foot = 0.6 foot

Area "A" Volume = 1,400 square feet x 0.6 feet

Area "A" Volume ≈ 840 cubic feet

The total volume would be the sum of Areas "A," "B," and "C."

## Converting to Gallons and Barrels

Each cubic foot is equivalent to 7.5 gallons

840 cubic feet x 7.5 gallons/cubic feet = 6,300 gallons

Each U.S. barrel is 42 gallons: 6,300 ÷ 42 gallons/barrel = 150 barrels of oil

## Considering Penetration

Determining how much additional oil has penetrated into the soil can be accurately measured by taking a core sample of the oil covered soil; however, the following rule should suffice for estimates of oil spilled.

For penetration allowance in normal sand or soil, add 5 percent to the total volume for every foot of average depth.

In the case of Area "A," the average depth was 7 inches, or 0.6 foot, so we add 3 percent.

150 barrels x 1.03 = 154.5

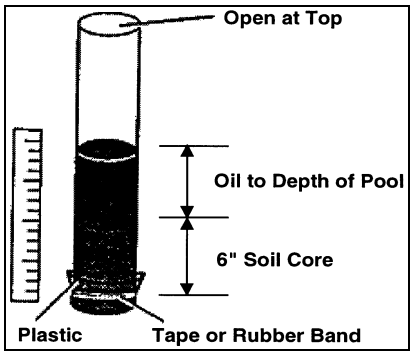
6,300 gallons x 1.03 = 6,489 gallons

- Do not add a penetration allowance to areas with slope that allowed a reasonable flow rate.
- Add an allowance for slow flowing areas.
- Reduce allowance by half if area is wet from rain.

**Note:** This is a method of estimating the volume of oil in the penetration. In the case above, the oil would penetrate 3 to 6 inches into the soil.

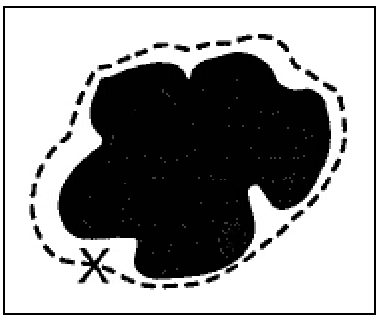
## Precise Penetration Determination

If a more precise determination is required, drive a clear plastic tube, about 2 inches or larger in diameter, 6 inches into the uncontaminated soil adjacent to the spill. Twist and remove with soil core. Seal the bottom of the tube with plastic and tape. Pour free oil into the top of the tube to the depth of the oil in the pool, mark the level, and allow to set for one hour. Measure how much the oil level has dropped. Observe how deep the oil has penetrated. Retain the model to observe increased penetration with time.




## Walk-Around Method

If the pool of oil is roughly circular, you can estimate its area by pacing around the pool and counting your paces. Walk as closely to the pool edge as possible. Try to make your paces 3 feet, or 1-yard long. If you counted 700 paces, the circumference is 700 paces by 3 feet/pace or 2,100 feet. The next step is to estimate how much smaller the actual pool is in comparison to the circle walked. If you were pretty close, deduct 10 percent.



2,100 feet x .90 = 1,890 feet adjusted circumference.

The diameter (d) of a circle is related to the circumference by the formula:

$$C = \pi d \text{ (where } \pi = 3.14)$$

If the circumference of our circle is 1,890 feet, then the diameter is:

$d = 1{,}890/\pi = 1{,}890/3.14 = 602$ feet and the radius is ½ $d = 602/2 = 301$ feet

The area of the pool is given by the formula:

$$\text{Area} = \pi r^2$$

$$A = 3.14 \times 301 \times 301$$

$$= 284{,}487 \text{ square feet}$$

Now you can estimate the average depth by guessing the maximum depth. If we guess the depth from the exposed slope to be 12 inches at the deepest part, we can divide by four (four sloping sides) to estimate an average depth of 3 inches or .25 feet. The volume is therefore:

V = 284,487 square feet x .25 feet

= 71,122 cubic feet

As before, we know each cubic foot contains ~7.5 gallons; therefore:

71,122 cubic feet/7.5 gallons/cubic feet = 9,483 gallons

To covert to barrels,

9,483 gallons/42-gallons/barrel = 226 barrels

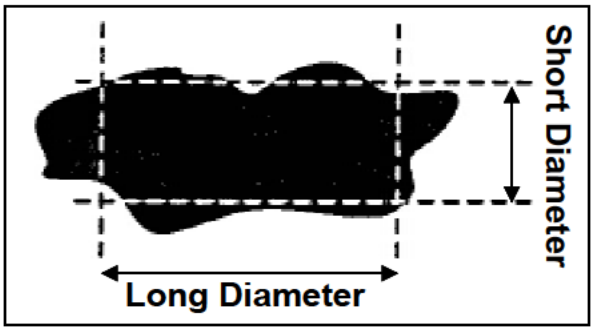
Our average depth was 3 inches, so we can add about 1 percent for penetration:

226 x 1.01 ≈ 228 barrels

**Average Diameters**

You can also estimate the area of an oval-shaped pool by placing off (3 feet per step) the width of the "short diameter" and the "long diameter" and averaging them.

First pace off the "short diameter," but stop short to allow for the irregular shape. Repeat the procedure for the "long diameter." Add them together and divide by two to get the "average diameter."




In this example, the "short diameter" was 75 paces or 75 x 3 = 225 feet. The "long diameter" was 120 paces, or 360 feet.

The average diameter = (225 + 360)/2 ≈ 292 feet and

the radius is ½ the diameter = 292/2 = 146 feet

$A = \pi r^2$ = (3.14) (146) (146) ≈ 66,932 square feet

The average depth is 3" or .25 feet

The volume is: V = 66,932 square feet x .25 feet = 16,733 cubic feet

For gallons: 16,733/7.5 ≈ 2,231 gallons

For barrels: 2,231/42 ≈ 53 barrels

**Comparison Methods**

Sometimes you can estimate area by comparing it to familiar areas, with adjustment for irregular shape. Several familiar areas include:

| | *Length* | *Width* | *Area* |
|---|---|---|---|
| Football field | 100 yds | 50 yds | 5,000 sq. yds |
| Basketball court | 74 ft | 50 ft | 3,700 sq. ft |
| Tennis court | 18 ft | 36 ft | 658 sq. ft |
| Baseball diamond | 90 ft | 90 ft | 810 sq. ft |
| Parking space | 20 ft | 10 ft | 200 sq. ft |
| Office | 10 ft | 10 ft | 100 sq. ft |
| Service station | 700 ft | 250 ft | 175,000 sq. ft |
| 4-lane intersection | 55 ft | 55 ft | 3,025 sq. ft |
| MacDonalds | 100 ft | 250 ft | 25,000 sq. ft |

**Inaccuracies in Estimates**

These examples offer quick methods of estimating for gross volumes, and are accurate within 20 percent. These accuracies should be sufficient for initial reporting and determining resource requirements. Drills have indicated that all of the estimates are generally within 10 percent of the others.

## 1.6.3 Predicting Slick Movements

**Factors Affecting Slick Movement**

The movement of spilled oil on the water would depend primarily on the effects of wind and surface currents present near the site of the spill. Surface currents will dominate slick movement unless the winds are strong. When winds are strong, they will cause the slick to move at approximately 3 percent of the wind speed in the same general direction. When currents and strong winds are absent, slick spreading will dictate slick movement. However, even if only weak winds or surface currents are present, they will dominate slick movement.

### Methods Available for Predicting Slick Movements

To determine the potential impacts of an oil spill and to aid in response operations, it is essential to predict the direction of oil slick movements. The initial direction of a slick's movement should be determined visually. Once the direction and speed of wind and current are known, a short-term projection can be made by performing a simple vector addition analysis. As the response effort proceeds, more sophisticated predictions would typically be generated.

## Visual

The Terminal Manager is familiar with the local geography and, when daylight and weather conditions permit, would be able to determine the initial direction of the slick's movement in relation to the coastline. In the event of a major spill, efforts would be made to enhance vital surveillance activities by placing a knowledgeable observer in a helicopter or fixed-wind aircraft.

## Vector Additional Analysis

A potentially longer range prediction of a slick's movement can be accomplished by vector addition of the two main motive forces that influence open ocean slick movements: surface currents and winds. Figure 1.6-4 is an example of the vector addition method.

## Surveillance Guidelines

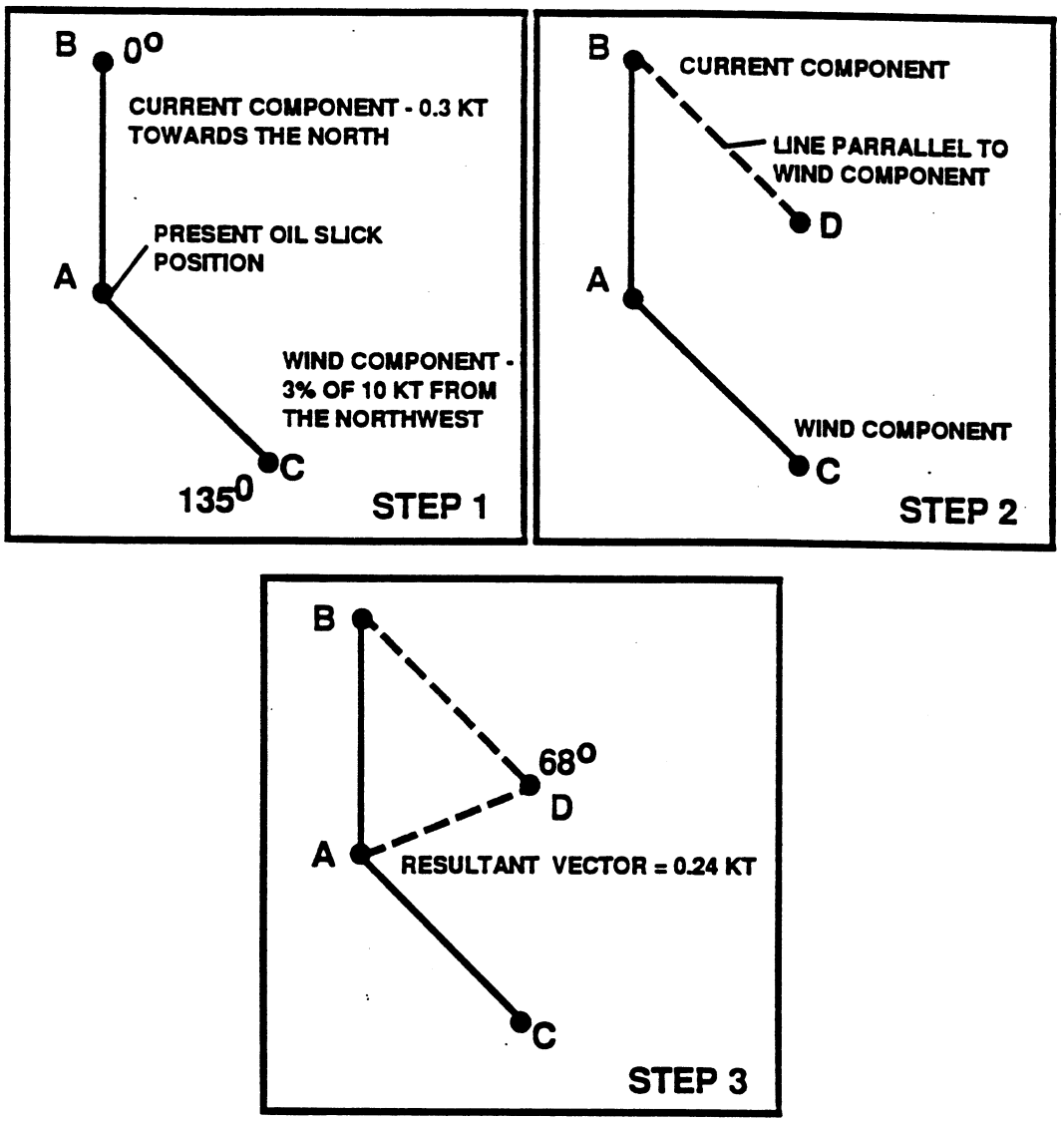
Surveillance operations would be essential to the conduct of response operations. Through surveillance, the Incident Commander (IC) can determine:

- The areal extent of the affected area.
- The direction of slick movements.
- The position of the slick in relation to unaffected environmentally and/or economically sensitive areas.
- Slick characteristics.
- Areas of heaviest oil concentrations including estimates of slick thicknesses.
- The location of wildlife.
- The location of response equipment.
- The location and degree of oiling on affected shorelines.

With this information, the IC can maintain tracking of the spill response resources under his/her command, and the Operations Section Chief can direct vessels into optimum positions for placing containment, recovery, and shoreline protection devices. Moreover, those conducting surveillance can take videotapes and/or photographs that can be used for documentation purposes.

If possible, aircraft could be dedicated to surveillance operations. This does not mean that the aircraft cannot be used for other operations, but that surveillance operations would always be granted priority treatment.

**Figure 1.6-4**
**Vector Addition Analysis**




STEP 1

Estimate current and wind directions and speeds from the present location of the slick (Point A). Draw current (i.e., to Point B) and wind component (i.e., to Point C) vectors in their relative directions and lengths (Note: the length of vectors should be in relation to the comparative velocities of the current and wind).

STEP 2

Draw a line parallel tot he wind vector starting from Point B and measuring the exact length of the wind vector (i.e., the distance from Point A to Point C).

STEP 3

Draw a line from the present location of the slick (i.e., Point A) to Point D). The line from Point A to Point D, or resultant vector that gives the direction and speed of the slick movement.

**Surveillance Resources Readily Available in the Local Area**

Surveillance resources readily available in the local area consist of helicopters and fixed-wing aircraft which can be contracted at the time of a spill.

## 1.6.4 Establishing a Command/Communications Post and Staging Areas

The following procedures provide an outline for establishing a Central Command/ Communications Post and staging areas. It is recognized that these procedures may be somewhat dependent upon the size of the incident. Therefore, an outline of general procedures for establishing a Command/ Communications Post and staging areas in the case of a major spill is provided. A major spill may require larger facilities and additional or larger staging areas. In such a case, the exact location for establishing command and communication posts and staging areas may not be definable until the area of impact is known.

Generalized procedures are followed by pre-designated locations for command and communication posts and staging areas that are designed to deal with localized and more site-specific oil spills.

### General Procedures

**Command/Communications Post**

A Command/Communications Post would be established to serve as the primary location for the Command Staff activities and various meetings and briefings held throughout response operations. The actual location of the Command/ Communications Post would depend upon the specific circumstances surrounding the incident. The Logistics Section Chief would be responsible for establishing the Command/Communications Post and should include:

- Proximity to incident location.
- Sufficient size to allow response personnel to operate effectively and comfortably.
- Room for conferences, Unified Command meetings, and media briefings.
- "Situation Room" with maps to track the spilled oil, response equipment locations, sensitive resource maps, lists of personnel and telephone numbers, and organization charts.
- Telephone and fax lines.
- Security.
- Office support systems (e.g., fax machines, copiers, telephone lines, computers, file system, AM radios, VHF/UHF radio telephone, base communication station, etc.).
- Communications system that would be used in an event could include: cellular telephones, local telephone system, company radios in vehicles and base stations, and pagers as conditions warrant.

**Field Command Post**

A Field Command Post may also be established at the scene of an incident. The primary function of the Field Command Post is to conduct all activities which are directed toward reduction of the immediate hazard, including recovery and cleanup operations.

**Staging Areas**

In a major spill response, numerous staging areas may be required to support containment and cleanup operations. Staging areas would need to be equipped with prime movers, cranes, and other machinery necessary to load/unload response equipment and supplies to trucks, vessels, etc. Personnel at staging areas need to establish inventory control systems to track equipment use. In selecting a suitable staging area, the following criteria should be considered:

- Direct access to impacted areas.
- Proximity to secure parking, airports, docks, pier or boat launches.
- Ability to be a secured area.
- Proximity to populated areas or environmentally-sensitive areas.
- Adequate lighting.

### 1.6.5 Containment and Recovery

This section describes the techniques that can be employed to contain and recover spilled oil. Containment is most effective when conducted near the source of the spill. The feasibility of effectively implementing containment and recovery techniques is generally dependent on the size of the spill, available logistical resources, implementation time, and environmental conditions or nature of the terrain in the spill area.

Aquatic spill containment is primarily conducted through the use of oil spill containment booms whereas skimmers are usually the most efficient means of recovery. Pumps, vacuum systems, and sorbents can also be effective. For terrestrial spills, trenches and earthen berms or other physical barriers are most often used to contain oil migrating on or just beneath the ground surface. Recovery of free oil from the ground surface is best achieved by using pumps, vacuum systems, and sorbents. Containment and recovery techniques are summarized in Table 1.6-3. The Cleanup Guides presented in Section 2.4 can aid in determining appropriate techniques.

### Terrestrial Spills

Containment and recovery of terrestrial spills is best achieved by using an earthen containment berm, trenches, or physical barriers within a natural or man-made drainage course (generally preferable as the oil is already partially contained and concentrated). The presence of existing drainage courses or containment structures is often critical to effective containment of large terrestrial spills as most containment techniques for flat surfaces do not provide a significant amount of storage capacity. A detailed description of berms, dams and barriers is presented in Section 2.2.

## Technique Selection

The primary factors influencing terrestrial containment and recovery are:

- Size – Most containment techniques provide limited storage capacity.
- Slope – Berms and barriers are generally less effective on steeper slopes and accessibility may be limited.
- Surface Texture – Rough surfaces with natural ridges and depressions enhance containment and should be taken advantage of whenever possible.
- Substrate Permeability – Highly permeable sediments will allow rapid penetration of oil into the substrate thus complicating containment and recovery.
- Existing Draining Courses – Oil is more easily contained and recovered if it is flowing within, or can be diverted to, existing natural or man-made drainage structures.
- Stormwater Runoff – Runoff generally requires the containment of larger quantities of liquids and complicates oil recovery.

## Aquatic Spills

Effective containment and recovery of aquatic spills depends, in part, on the spill circumstances, how quickly the techniques can be implemented, and the prevailing environmental conditions. Regardless of the size of the spill, containment is most effective if conducted at or near the source of the spill before the spill spreads into a large area. The larger the area covered by the spill, the more equipment and manpower will be required. Containment at or near the source is also often associated with thicker layers of oil within the containment booms which, in turn, increases the efficiency of most skimmers.

The prevailing environmental conditions can affect containment and recovery, both in terms of effectiveness and deployment of equipment. In high winds, currents, and waves, equipment deployment is difficult and often unsafe. Wind and currents can add significant tension on containment booms making it difficult to anchor the booms in place, tow them in a catenary or "U" configuration, or connect sections of boom together in the water. Strong currents can also cause entrainment of oil in the water stream flowing beneath the boom resulting in ineffective containment. Wind-generated waves can splash oil over the top of the boom also reducing containment effectiveness.

## Technique Selection

On-water recovery techniques are described in detail in Section 2.5. Selection of an appropriate aquatic containment and recovery technique depends on a number of factors, including:

- Current Speed – Surface currents >1 knot can cause boom failure or entertainment of oil beneath the boom.
- Water Depth – Depths >50 feet can complicate boom anchor placement whereas depths <2 feet can preclude effective boom use. Depths <5 to 10 feet can also preclude the use of larger boats for open water containment.
- Channel Width – Widths >200 to 300 feet will generally preclude using booms to completely contain oil floating in the waterway, particularly if strong currents are present.
- Wave Height – Breaking waves >1 to 2 feet and 0.5 to 1 feet will respectively render most booms and skimmers ineffective.
- Slick Thickness – Recovery effectiveness with pumps/vacuum systems and skimmers decreases with slick thickness becoming relatively ineffective for very thin slicks or sheens.
- Shoreline Access – Obstacles (i.e., rocks, debris, etc.) in the water or within steep or densely vegetated backshores could restrict access and present safety and operational problems.
- Anchor Points – Soft bottom substrates can affect boom anchor placement.
- Safety – High currents, winds, and waves, large obstacles, and other dangerous conditions could present safety hazards and preclude technique implementation.

## Table 1.6-3
## Summary of Containment and Recovery Techniques

| TECHNIQUE | DESCRIPTION | PRIMARY LOGISTICAL REQUIREMENTS | LIMITATIONS[1] | POTENTIAL ENVIRONMENTAL EFFECTS |
|---|---|---|---|---|
| **Terrestrial Spills – Containment** | | | | |
| A. Containment/ Diversion Boom | Construct earthen berms ahead of advancing surface spill to contain spill or divert it to a containment area. | Equipment<br>1 – Backhoe, bulldozer, front-end loader, or set of hand tools.<br>Personnel<br>4 – 8 workers | • Steep slopes<br>• Porous substrate | • Disturbance to surface soils and vegetation<br>• Increased oil penetration |
| B. Storm Drain Blocking | Block drain opening with sediments, plastic sheet, boards, etc., and secure to prevent oil from entering drain. | Equipment<br>Misc. hand tools;<br>1 – Board, plastic sheet, mat, etc.<br>Personnel<br>1 – 2 workers | • May be advantageous for oil to enter drain<br>• Heavy precipitation | • Increased oil penetration<br>• Oil can spread to other areas |
| C. Blocking Drains | Construct dam in drainage course/ streambed to block and contain flowing oil. Cover with plastic sheeting. | Equipment<br>1 – Backhoe, bulldozer, front-end loader, or set of hand tools.<br>Personnel<br>4 – 6 workers | • Upstream storage capacity<br>• Flowing water | • Increased oil penetration |
| D. Culvert Blocking | Block culvert opening with plywood, sediments, sandbags, etc. to prevent oil from entering culvert. | Equipment<br>Misc. – Hand tools;<br>Misc. – plywood, sandbags, etc.<br>Personnel<br>3 – 4 workers | • Upstream storage capacity<br>• Flowing water | • Increased oil penetration |
| E. Interception Trench/ Barrier | Excavate trench or install barrier ahead of advancing surface/near-surface spill to contain spill. Cover bottom and down-gradient side with plastic. | Equipment<br>1 – Backhoe, set of hand tools<br>Misc. – plastic sheeting or plywood/ sheet material<br>Personnel<br>3 – 6 workers | • Slope<br>• Depth to near-surface flow | • Increased oil penetration<br>• Disturbance to surface soils and vegetation |
| F. Shoreline Containment Booming | Deploy boom around point of oil entry into water and anchor to shoreline on either side. | Equipment<br>1 – Boat<br>100 feet – boom (min.)<br>3 – Anchor systems (min.)<br>Personnel<br>2 – 3 workers | • Currents > 1 to 2 knots<br>• Waves > 1 to 2 feet<br>• Water depths > 50 feet | • Minor disturbance to substrate at anchor points<br>• Heavy oiling of shoreline within booms and associated impacts |

**Table 1.6-3 (*continued*)**
**Summary of Containment and Recovery Techniques**

| TECHNIQUE | DESCRIPTION | PRIMARY LOGISTICAL REQUIREMENTS | LIMITATIONS[1] | POTENTIAL ENVIRONMENTAL EFFECTS |
|---|---|---|---|---|
| **Aquatic Spills – Containment and Recovery** | | | | |
| G. Open Water Containment Booming | Boom is deployed between two boats in a "U" shape in front of approaching slick to contain oil and prevent contact with shoreline. | Equipment<br>2 – Boats<br>200 feet of Boom (min.)<br>Misc. – Tow lines, connectors, bridles, etc.<br>Personnel<br>4 workers + boat crew | • Waves > 1 to 2 feet<br>• High winds<br>• Currents > 2 knots | • No significant effects |
| H. Narrow Channel Containment Booming | Boom is deployed across channel at an angle to contain floating oil passing through channel. | Equipment<br>1– Boat, vehicle or winch<br>1 to 2 Booms (1.2 channel width ea.)<br>2 to 10 – Anchor systems<br>Personnel<br>2 – 3 workers | • Currents > 2 to 3 knots<br>• Water depths > 50 feet (anchoring)<br>• Sensitive shorelines | • Minor substrate disturbance at anchor points<br>• Heavy shoreline oiling at downstream anchor point |
| I. Sorbent Barriers | A barrier is constructed by installing two parallel lines of stakes across a channel, fastening wire mesh to the stakes, and filling the space between with sorbents. | Equipment (per 100 feet of barrier)<br>1 – Boat<br>20 – Fence posts<br>200 feet – Wire mesh<br>200 sq. feet – Sorbents<br>Misc. – Hand tools, fasteners, support lines, additional stakes, etc.<br>Personnel<br>2 – 3 workers | • Water depths > 5 to 10 feet<br>• Currents > 0.5 knots<br>• Soft substrate | • Minor substrate disturbance at post and shoreline anchor points<br>• High substrate disturbance if boat is not used |
| J. Skimmers | Self-propelled skimmers work back and forth along the leading edge of a slick to recover the oil. Booms may be deployed from the front of a skimmer in a "V" configuration to increase sweep width. Portable skimmers are placed within containment booms in the area of heaviest concentration. | Equipment (Self-Propelled)<br>200 feet – Boom (min.)<br>2 – Boats<br>Misc. – Tow lines, connectors, bridles, etc.<br>Equipment (Portable)<br>50 feet – Hoses (min.)<br>1 – Pump (if required)<br>500 gallons – Storage (min.)<br>Personnel<br>4 workers + boat crew | • Waves > 0.5 to 1 foot<br>• High winds<br>• Currents > 2 knots | • No significant effects |

## Table 1.6-3 (*continued*)
## Summary of Containment and Recovery Techniques

| TECHNIQUE | DESCRIPTION | PRIMARY LOGISTICAL REQUIREMENTS | LIMITATIONS[1] | POTENTIAL ENVIRONMENTAL EFFECTS |
|---|---|---|---|---|
| **Aquatic Spills – Containment and Recovery (*continued*)** | | | | |
| K. Sorbents | Sorbents are applied manually to heavy oil coatings or accumulations on land or sheens on water to recover the oil. | Equipment<br>Misc. – Sorbents, bags or containers for oiled sorbents<br>Personnel<br>1 – 10 workers | • Very light or weathered oil coatings/sheens<br>• Steep or slippery shorelines | • Significant substrate disturbance<br>• Foot traffic can trample vegetation/crush organisms<br>• Possible ingestion of residual sorbents by animals |

[1] In addition to implementation time and accessibility

NOTE: The quantities, type of equipment and manpower shown in this table are based on experience in performing each individual task. Necessary containment/cleanup techniques will be used in the appropriate timeframes. As needed, Tesoro will allow input from response contractors with regard to an evaluation of the scope of cleanup activities and the availability and location of spill response resources.

### 1.6.6 Sensitive Area Protection

In the event of an aquatic spill from the Tesoro pipeline, it may be necessary to protect sensitive areas if it appears that open water oil containment and recovery efforts will not be sufficient to control the entire spill. Protection refers to the implementation of techniques or methods to prevent oil from making contact with a shoreline or aquatic area that is determined to be sensitive for environmental, cultural, or human use reasons. Sensitive areas in the vicinity of the pipeline include: wildlife refuges, water intakes, waterfront industrial facilities, parks or other recreation areas and shorebird and waterfowl use areas. Sensitive areas are displayed on the maps in Appendix E.

The common protection techniques are summarized in Table 1.6-3 (complete descriptions are presented in Section 2.3). Selected containment and recovery techniques listed in Section 1.6.5 (e.g., open water and narrow channel containment booming and sorbent barriers [see Table 1.6.2]), can also be used for protection purposes.

### 1.6.7 Oiled Wildlife Rehabilitation

The rehabilitation of oiled wildlife is a complex and intensive process that includes the retrieval of affected animals, treatment for toxic effects of the oil, medical treatment, careful cleaning, specialized care and feeding, and preparation for release.

North Dakota, this responsibility rests with the North Dakota Department of Game and Fish. Contact phone numbers are listed in Section 1.2 of this OSCP.

The North Dakota Department of Game and Fish are responsible for initiating and coordinating all wildlife rescue efforts. Tesoro will support these efforts and supply equipment as requested through the Unified Command.

Tesoro recognizes that the rehabilitation of oiled waterbirds is a specialized activity and will call upon the services of the Tri-State Bird Reserve to carry out the established rehabilitation procedures.

Tables 1.6-5 and 1.6-6 provide data sheets for the collection of contaminated or dead wildlife. These sheets are provided to accelerate Tesoro's ability to collect information should a spill occur.

### 1.6.8 In Situ Burning and Dispersant Application

The Tesoro Spill Management Team is trained in the use of dispersants and burning techniques for spill response. The team has immediate access to dispersant and burning equipment through contracts with OSROs around the country.

While the use of dispersants is gaining recognition as a viable response technology in the U.S., the use of dispersants in inland areas (e.g., rivers and lakes) is generally not considered appropriate.

**Table 1.6-4**
**Summary of Aquatic Protection Techniques**

| TECHNIQUE | DESCRIPTION | PRIMARY LOGISTICAL REQUIREMENTS | LIMITATIONS[1] | POTENTIAL ENVIRONMENTAL EFFECTS |
|---|---|---|---|---|
| A. Exclusion Booming | Boom is deployed across or around sensitive areas and anchored in place. Approaching oil is excluded from the area. | Equipment (per 500 feet of boom)<br>1 – Boat<br>6 – Anchor systems<br>750 feet – Boom (min.)<br>Personnel<br>3 workers + boat crew | • Currents > 1 to 2 knots<br>• Waves > 1 to 2 feet<br>• Water depth > 50 feet (anchoring) | • Minor substrate disturbance at anchoring points |
| B. Diversion Booming | Boom is deployed from the shoreline at an angle towards the approaching slick and anchored or held in place with a work boat. Oil is diverted towards the shoreline for recovery. | Equipment<br>1 – Boat<br>3 – Anchor systems (min.)<br>100 feet – Boom (min.)<br>Personnel<br>3 workers + boat crew | • Currents > 2 to 3 knots<br>• Waves > 1 to 2 feet<br>• Water depth > 50 feet (anchoring)<br>• Sensitive shorelines | • Minor substrate disturbance at anchoring points<br>• Heavy oiling at shoreline anchor point |
| C. Deflection Booming | Boom is deployed from the shoreline away from the approaching slick and anchored or held in place with a work boat. Oil is deflected away from the shoreline. | Equipment<br>1 – Boat<br>5 – Anchor systems<br>200 feet – Boom<br>Personnel<br>3 workers + boat crew | • Currents > 2 to 3 knots<br>• Waves > 1 to 2 feet<br>• Water depth > 50 feet (anchoring)<br>• Onshore winds | • Minor substrate disturbance at anchoring points<br>• Oil is not contained and may contact other shorelines |
| D. Inlet Dams | A dam is constructed across the inlet or channel using local shoreline sediments to exclude oil from entering inlet. Dam can be covered with plastic to minimize erosion. | Equipment<br>1 – Backhoe, bulldozer, front-end loader, or set of hand tools<br>1 – Plastic sheeting roll<br>Personnel<br>2 – 6 workers | • Water outflow<br>• Inlet depth > 5 feet<br>• Excessive inlet width | • Sediment/vegetation disturbance at borrow areas<br>• Inlet substrate disturbance<br>• Increased suspended sediments<br>• Water in inlet can become stagnant |

[1] In addition to implementation time and accessibility.

NOTE: The quantities, type of equipment and manpower shown in this table are based on experience in performing each individual task. Necessary containment/cleanup techniques will be used in the appropriate timeframes. As needed, Tesoro will allow input from response contractors with regard to an evaluation of the scope of cleanup activities and the availability and location of spill response resources.

**Table 1.6-5**
**Data Sheet for Collection of Live Contaminated Wildlife**

Date:_____ Oil Spill Incident:

Rehabilitation Identification Number:

Specific Capture Location:

Common Name:

Genus:_____ Species:

Was Specimen Obviously Oiled?

Extent of Oiling (circle one):
1. Completely covered
2. Ventral or dorsal surface only
3. Discrete spots
4. No obvious oil

Date of Arrival at Treatment Center:
Date Cleaned:
Date Released:
Location of Release:
Date Died:
Collected By:

Printed Name
Signature
Date
Telephone #
Affiliation
Address

Relinquished To:

Printed Name
Signature
Date
Telephone #
Affiliation
Address

**Table 1.6-6**
**Data Sheet for Collection of Dead Contaminated Wildlife**

Date:_____ Oil Spill Incident:

Specific Location:

Species Found:

Was Specimen Obviously Oiled?

Was Specimen Scavenged?

Comments:

Collected By:

Printed Name
Signature
Date
Telephone #
Affiliation
Address

Relinquished To:

Printed Name
Signature
Date
Telephone #

Affiliation
Address

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## 1.7 WASTE MANAGEMENT

Oily waste recovery and disposal are critical to an effective oil spill response since shortages of storage areas can effectively shutdown recovery operations.

A spill from the Tesoro Pipeline could involve crude oil. Recovered oil would either be returned to tanks at one of the Pipeline Stations stored in bulk tank trucks, or portable tanks until the oil could be transported to the Mandan Refinery.

Waste materials associated with a spill on land would include contaminated absorbent materials, personal protective equipment, and soil. For a spill on water, it is anticipated that oil and potentially significant amounts of oily water would be recovered.

In addition to over 96,000 barrels of tankage at the Mandan Refinery, Tesoro maintains additional interim storage capacity (for recovered liquids) available under contract in the local area as follows:

| Owner | Type | Capacity (bbls) | Location & Response Time |
|---|---|---|---|
| Bay West | Ashland Refinery (F) | 5,952 | St. Paul, MN-12 hrs |
| Bay West | Wayne Transport (P)(T) | 13,714 | Rosemount, MN-12 hrs |
| Quali Tech | TSB (P) | 500 | Chaska, MN-10 hrs |
| Quali Tech | Fast Tank- 3 each (P) | 180 | Chaska, MN-10 hrs |
| CEDA | Tanker Truck (P)(T) | 143 | Mandan, ND-1 hr |
| CEDA | Vacuum Trucks- 3 each (P)(T) | 240 | Mandan, ND-1 hr |
| Tesoro Pipeline | 1000 gallon FDT portable tank (1992 Haulmark Spill Trailer #2)-(P) | 24 | Sidney, MT-6 hrs |
| Tesoro Mandan Refinery | 2,400 gallon Fast Tank- 2 each (Spill Response Trailer) (P) | 114 | Mandan, ND-1hr |
| Tesoro Mandan Refinery | Refinery Tankage (F) | 96,000 | Mandan, ND-1hr |
| **Total Temporary Storage Capacity: 116,867 bbls** | | | |

(P) = Portable Storage
(F) = Fixed Storage
(T) = Transportation Capable

### 1.7.1 Disposal Plan

Tesoro's waste disposal plan is included as Appendix B. The plan is designed to accelerate the waste disposal procedure during a spill response. Tesoro will work closely with EPA to develop a plan for the disposal of oily waste. Recovered oil and oily debris shall be recycled and reused to the extent feasible to reduce the amount of oily waste which must be incinerated or taken to a landfill. Contaminated debris will be disposed of at a facility that has been approved for use by Tesoro.

### 1.7.2 Recovery of Spilled Oil

Collection methods and activities are under the immediate control of the Operations Section Chief. The Waste Management Specialist is responsible for handling wastes and will be in constant communication with the operations section chief to understand the requirements.

As oil is recovered, it should be placed in sealable containers such as portable tanks, tank trucks, or any other container that can be sealed to prevent spillage. At the Refinery Manager's discretion, recovered oil may be pumped back into sound tanks of compatible material at the Tesoro Mandan Refinery.

Oiled solid wastes should be placed in leak-proof containers to prevent leakage during handling and transportation. Double-walled plastic bags may be used for this purpose. For larger materials or those which could penetrate the bags, debris boxes or similar containers could be used as long as they are lined with plastic or by some other means to prevent leakage. Hazardous waste bins and lined dump truck beds may also be used for collection of oiled solid wastes.

### 1.7.3 Interim Waste Storage

Interim or temporary waste storage of liquid and solid wastes collected during the recovery and cleanup operations is often required for proper waste classification, segregation, and packaging, in addition to making arrangements for recycling, treatment, or disposal. Small quantities of wastes can be stored in a variety of commercially available containers.

Interim storage of larger quantities of waste may require the construction of a temporary waste storage site. The sites should be located with good access to the cleanup operations and to nearby streets and highways. Flat areas, such as parking lots or undeveloped lots with a minimum slope to minimize runoff potential, are preferable. Interim storage should be sufficient to keep up with recovery operations and handle the entire volume of oil recovered and oily wastes generated.

Use of any site is dependent on the approval of the local health authority and EPA at the time of an incident. In some cases, sites can be predesignated to save time. For small spills which are located within close proximity to one of the Pipeline Stations, small waste containers, and if needed, constructed storage beds will be located on pipeline property with prior approval. Storage areas for large spills and those that migrate away from the Station's will be located at the staging areas or other mutually agreeable site with appropriate agencies and organizations.

Normally, location approval for interim storage can be accomplished by working in conjunction with the FOSC, SOSC, and local planning representatives within the Unified Command System. Should additional assistance be required, Table 1.7-1 provides information for each relevant agency/ organization such as jurisdiction and telephone numbers. Primary contacts are the local health department and EPA. The other listed agency/organizations may need to be contacted to address additional health, safety, and environmental concerns.

Some of the information which is pertinent in obtaining necessary permits/approvals includes proposed location, anticipated volume of liquid, type of product spilled, known health concerns, and results of analytical testing (if any).

**Table 1.7-1**
**Interim Storage-Permit/Approval Guide-Local/State/Federal**

***Mandan/Bismarck Area***

| Agency | Area of Jurisdiction | Phone No. |
|---|---|---|
| Mandan Fire Department | Local/Morton County | (701) 667-3288 |
| Morton County Emergency Management Director | Morton County | (701) 667-3307 |
| North Dakota Industrial Commission (Oil and Gas Division) | State- Land | (701) 328-8020 |
| EPA – Region 8 | Federal/U.S. –Water & Land | (303) 312-6312 |

When considering a potential site, the following should be reviewed:

- Local geology
- Proximity to groundwater/surface water
- Availability of cover material (if any)
- Soil type
- Flooding potential
- Containment berm
- Land use
- Access
- Public contact
- Capacity
- Climate
- Toxic air emissions
- Security
-

Temporary storage sites should be designed to use the best achievable technology to protect the environment and human health. These sites should be set up in such a manner as to prevent leakage, contact, and subsequent absorption of oil by the soil.

## 1.7.4 Waste Characterization

The primary objective of waste characterization is to ensure employee safety and proper waste handling and disposal in accordance with applicable state and federal guidelines. Response operations will generate oily liquid and solid/semi-solid wastes. Some of these materials may be

regulated as hazardous wastes. A summary of the types of wastes and the associated response operations that generate the wastes and waste handling procedures are provided below. Additional information on handling wastes generated during an oil spill response can be found in the Waste Disposal Plan (Appendix B).

**Liquid Wastes**

Oily liquid wastes (i.e., oily water and emulsions) that would be handled, stored, and disposed during response operations are very similar to those generated during routine facility operations. The largest volume of oily liquid wastes would be produced by recovery operations (e.g., through the use of skimmers). In addition, oily water and emulsions would be generated by boat and equipment cleaning operations, the storage area stormwater collection systems, and wildlife cleaning and rehabilitation operations.

**Solid/Semi-Solid Wastes**

Oily solid/semi-solid wastes which would be generated by containment and recovery operations include damaged or worn-out booms, uncleanable equipment, used sorbent materials, saturated soils, contaminated beach sediments, driftwood, and other debris. In addition, wildlife capture, cleaning, and rehabilitation operations would produce oil-soaked towels and newspapers.

**Hazardous Wastes**

The EPA definition of hazardous wastes is defined in 40 CFR 261.

Per RCRA's Chapter 7045: Hazardous Waste Rules, a material is defined as hazardous for one of two reasons:

1. It could be one of the substances listed in 7045.0020 and/or 40 CFR 261, Subpart D; or
2. It could exhibit one of the following characteristics:
   - Ignitable
   - Reactive
   - Corrosive
   - Toxic

All oily waste materials generated from a spill should be characterized as dangerous until indicated otherwise by a state-accredited laboratory. Each waste must be characterized on a case-by-case basis through laboratory analysis of representative samples.

**Segregation of Waste Types**

The various types of wastes generated during response operations would require different disposal methods. To facilitate the disposal of wastes, all waste materials would be segregated by type for temporary storage and/or transport. Table 1.7-2 lists several options that are available to segregate oily wastes into liquid and solid components and depicts methods that may be employed to separate free and/or emulsified water from the oily liquid waste.

### 1.7.5 Transportation

Waste materials recovered from the water should be loaded at a location which provides convenient access, such as a boat ramp. Recovered waste materials from land should be loaded at designated transfer locations.

Carriers should be arranged to transport waste. Drums can be used for loading materials that are flammable (flashpoint less than 100°F). United States Department of Transportation (DOT) specification 17E or 17H drums can be used for liquids having a flashpoint between 20°F and 73°F, and a vapor pressure less than 18 psi absolute, at 100°F (49 CFR 119(1)). For loading solid materials that have a flashpoint from 100°F to 200°F, rolloff bins can be used. Vacuum trucks can be used for loading liquid waste materials.

Waste materials should always be covered during transportation. All truck rolloff bins shall be lined with precut plastic sheets before loading to prevent oil from leaking onto the streets. Tarpaulin covers must be used to minimize blowing or spilling of loads. New liners shall be used for each load.

The Tesoro Waste Management Specialist will ensure that waste is transported under proper permits and labels/placards for transportation per Hazardous Waste Manifest and Transport guidelines.

### 1.7.6 Handling

Spilled free oil and waste materials recovered from land and water require responsible handling. Handling can pose initial and long-range problems including the storage and transportation of the material to a disposal or processing site, as well as the proper recycling, treatment, and disposal methods. Legal requirements for waste handling are established by the EPA.

A primary concern in handling recovered oil and oil solid wastes is to prevent oiling of previously unaffected areas or re-oiling of areas already cleaned. This can be accomplished by using correct handling techniques. All workers associated with the handling portion of waste should be briefed with respect to incident-specific Health and Safety Plan by the Waste Management Specialist.

Disposal of waste must be minimized. This is accomplished by proper identification, waste segregation, recycling, and treatment. Only the residue from these steps must be disposed of by an approved method.

**Table 1.7-2**
**Oily Waste Segregation**

| TYPE OF MATERIAL | SEGREGATION METHODS |
|---|---|
| ***Liquids*** | |
| Non-emulsified oils | • Treatment at Mandan Refinery, or equivalent.<br>• Gravity separation of free water. |
| Emulsified oils | • Treatment at Mandan Refinery.<br>• Emulsion broken to release water by:<br>- heat treatment<br>- emulsion breaking chemicals<br>- mixing with sand<br>- centrifuge<br>- filter/belt press |
| ***Solids*** | |
| Oil mixed with sand | • Collection of liquid oil leaching from sand during temporary storage.<br>• Extraction of oil from sand by washing with water or solvent.<br>• Removal of solid oils by sieving. |
| Oil mixed with cobbles, pebbles, or shingle | • Screening.<br>• Collection of liquid oil leaching from beach material during temporary storage.<br>• Extraction of oil from beach material by washing with water or solvent. |
| Oil mixed with wood, plastics, seaweed, and sorbents | • Screening.<br>• Collection of liquid oil leaching from debris during temporary storage.<br>• Flushing of oil from debris with water. |
| Tar balls | • Separation from sand by sieving. |

## 1.7.7 Waste Disposal

A number of alternatives are available for waste disposal. Recycling, treatment, or incineration of spill-generated wastes are generally preferable to landfilling, where appropriate. In the selection of one or more disposal options, consideration must be given to stipulations set by environmental regulations as well as a clear understanding that if permanent disposal sites (i.e., landfills and treatment/stabilization locations) are utilized, they must have sufficient capacities to handle waste volumes generated.

In accordance with Chapter 70.105.150 of the Oil and Hazardous Substance Spill Prevention and Response Act, management and disposal of hazardous/dangerous wastes should be prioritized as follows:

1. Waste Reduction
2. Recycling
3. Physical, Chemical and Biological Treatment
4. Incineration
5. Solidification/Stabilization Treatment
6. Landfill

*Recycling*

Recycling is the preferred method of handling recovered oil. The relative salvageability of the recovered oil should be determined by the Waste Management Specialist.

Oil recovered from aquatic areas will typically contain substantial amounts of water, oil, and debris. A tank or vacuum truck can be used as an effective oil water separator by allowing the oil/water mixture to stand long enough for the oil and water to separate. The water is then drained off the bottom through the valved pipe, and the oil is pumped into a storage tank or truck. Any water drained off by separation techniques should be discharged into an aboveground tank, or effluent treatment system, as it may still contain minor amounts of oil. The Tesoro Environmental Unit Leader can assist with proper handling of the separated water.

Material reclaimed from the spill which can be recycled to yield a significant amount of oil and that oil returned to process, can be brought into the Mandan refinery. This recycling activity may be exempt from hazardous waste transport regulations, depending on the characterization of the material.

*Treatment*

Federal and state land disposal restrictions prohibit the land disposal of hazardous waste without prior treatment to strict standards. These standards vary depending upon whether the waste is classified as RCRA or state hazardous waste, and whether the waste is a listed or characteristic hazardous waste. Contact the Tesoro Environmental Unit Leader for applicable requirements.

*Disposal*

Non-recyclable waste or treatment residue may need to be disposed of at a licensed Class I landfill. Provisions should be made in advance to factor the landfill's acceptance requirements into any proposed disposal activities. Since the cost for sending non-recyclable oily waste to a landfill is significant, the amount of waste to be disposed of should be minimized to the maximum extent possible given the economic and technical constraints.

Other alternatives such as bioremediation and energy recovery (some recovered oil may be burned through boiler or heating systems) are also encouraged.

**Table 1.7-3**
**Hazardous Waste Incinerators**

| STATE | CITY |
|---|---|
| Arkansas | El Dorado |
| Illinois | Chicago<br>Savget |
| Kansas | Coffeyville |
| Kentucky | Calvert City |
| Louisiana | Baton Rouge |
| New Jersey | Bridgeport |
| Ohio | Grafton |
| South Carolina | Rock Hill<br>Roebuck |
| Texas | Deer Park<br>Houston<br>Port Arthur |
| Wisconsin | Eau Claire |

**Table 1.7-4**
**Waste Landfills**

| FACILITY | CONTACT | PHONE NUMBER |
|---|---|---|
| Polk County Sanitary Landfill<br>Crookston, MN 56716 | Bill Wilson<br>SW Resource Recovery Plant | (218) 435-6501 |
| Spruce Ridge Resource Management<br>USA Waste Services - Spruce Ridge<br>(former McLeod and Spruce Ridge)<br>Route 3, Box 70A<br>Glencoe, MN 55336 | Mark Reinert<br>Spruce Ridge Resource Management<br>McLeod Landfill, Inc. | (320) 864-5503 |
| Superior FCR Landfill, Inc.<br>(former Yonak)<br>P.O. Box 516<br>Buffalo, MN 55313 | Chris Basqell<br>Superior Services, Inc. | (320) 963-3158 |
| Clean Harbors Environmental Services<br>P.O. Box 168<br>Sawyer, ND 58781 | | (701) 624-5622 |
| Dishon Disposal<br>3950 153rd Avenue<br>Williston, ND 58801 | | (701) 572-9079 |
| SKB Rosemount | Mike Fullerton | (651) 438-1513 |

*Each facility establishes its own level of acceptable.

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## 1.8 TRAINING AND DRILLS

The Pipeline Manager and Field Specialists will be trained to the following level:

- 24-Hour HAZWOPER
- Incident Command System (ICS)
- Qualified Individual
- Oil Spill Response

The Training Supervisor prepares and conducts a spill prevention training session in conjunction with safety meetings. At minimum, the Pipeline Manager and Field Specialists will receive training adequate to satisfy HAZWOPER Level 3 (24-hour) requirements. This will typically include:

- Hazard Communication
- Site Security and Control
- Emergency Response Plan and Equipment
- Personal Protection Equipment
- Decontamination Procedures
- Standard Operating Procedures and Safe Work Practices

Field Specialists may also participate in spill response training or drill programs conducted by local response contractors or other oil terminal/pipeline operators. Training records are on file at the Main Office and available for PHMSA inspection.

Primary response contractors (and their subcontractors) will be trained to OSHA "HAZWOPER" (29 CFR Part 1910.120) spill response standards.

### 1.8.1 Tesoro Incident Command Training

All members of the Tesoro Incident Command and Spill Response Team designated as commanders, officers, section chiefs, or supervisors who initially respond to an oil spill will have received a minimum of 16 hours of IC instruction through formal classroom settings, table top oil spill drills, or deployment response drills. Most members of the Tesoro Incident Command Team below the level of chiefs or supervisors will have received a minimum of 8 hours of similar IC instruction. A few of the members below the level of chiefs or supervisors will not receive formal IC training, but will become part of the team due to their personal experience or routine job activities within Tesoro.

### 1.8.2 Tesoro Oil Spill Response Field Supervisors

Tesoro has established a spill response team that has been specifically trained to work with contractor personnel for Tesoro during oil spill responses. Field Supervisors may respond to contain,

control, or cleanup a spill, or to supervise other Tesoro, oil industry, or contract personnel in all phases of oil spill response activities.

As a general goal, Field Supervisors will receive the following training, or have the equivalent of such training through work experience:

- 40-Hour HAZWOPER Class
- 8-Hour HAZWOPER Supervisor's Class
- 8-Hour Annual HAZWOPER Refresher Update
- 8-Hour ICS Training
- On-Water and Land General Oil Spill Response
- Oil Spill Dispersant Training
- In Situ Burning Oil Spill Response
- Full Equipment Deployment, On-Water Response Drills

Following initial training, Field Supervisors will also receive a minimum of 8 hours of refresher spill response training on an annual basis.

### 1.8.3 Response Plan Review

The Pipeline Manager will review this Response Plan with the Field Specialists periodically, use the Plan during spill response drills, and practice policies which are described in this Response Plan to assure that all personnel are familiar with the Plan. This process is in place to assure that staff personnel are sufficiently familiar with the Pipeline Response Plan so that it can be used as an effective spill response tool.

### 1.8.4 Drills and Exercises

The *National Preparedness for Response Exercise Program (NPREP) Guidelines* (G.P.O.: 1994 O381-595 QL 3) will be followed to assure that Tesoro personnel are sufficiently trained for oil spill response. The Tesoro Incident Command and Response Team will receive training through participation in quarterly QI telephone drills, annual spill management team tabletop exercises, unannounced drills, and annual deployment exercises scheduled to meet NPREP guidelines. Field Supervisors will receive spill response training through annual equipment deployment and associated tabletop exercises.

Contractors and OSROs are responsible for completing the required drills in compliance with OPA and NPREP. Records of these drills will be forwarded to Tesoro and maintained on file by the Contingency and Emergency Response Coordinator (CERC) at the Dickinson office and the Mandan Refinery.

The Pipeline Manager is responsible for ensuring that drills are completed and documented as required. Drills for the Tesoro High Plains Pipeline include the following:

### *Quarterly Notification Exercise*

The purpose of the quarterly notification exercise is to ensure that the Primary or Alternate Qualified Individual (or designee, as specified in the Response Plan) and response contractors are able to be reached in a spill response emergency to carry out their required duties. Contact by telephone, radio, message - pager, or facsimile must be made with the key individuals listed in Section 1.2 of the Plan, and confirmation must be received to satisfy the requirements of this exercise.

The quarterly notification exercise will be initiated by a qualified Field Specialist at the direction of the Pipeline Manager. The exercise will be documented using the notification forms provided in Section 1.2 of the Plan. Federal and state agencies do not need to be included in the quarterly notification exercise.

At least once a year, the quarterly notification exercise should be conducted during non-business hours.

### *Annual Spill Management Team Tabletop Exercise*

Section 1.5 of the Response Plan identifies the spill management team. This spill management team will conduct an annual tabletop exercise, in accordance with the guidance document. The Response Plan must be utilized in the exercise to ensure the spill management team is familiar with the plan and is able to use it effectively to conduct a spill response. At least one spill management team tabletop exercise in a triennial cycle will involve a worst case discharge scenario.

The spill management team tabletop exercises should take into account shift changes to ensure that all personnel serving as part of the spill management team during an actual spill have participated in an exercise.

### *Semiannual Equipment Deployment Exercise*

At least twice each year, pipeline operating personnel will participate in an exercise to deploy the containment boom maintained by the pipeline. When planning for the location of the deployment exercise, consideration should be given to access for personnel and recovery equipment. Locations and time of year for the exercise should vary in order familiarize personnel with regional access and changing seasonal conditions.

### *Triennial Cycle*

Every 3 years all core components of the entire response plan must be exercised. Rather than requiring each plan holder to conduct a major exercise every 3 years, the individual components can be exercised in portions through the required exercises.

The following are the basic types of core components that must be exercised at least once every 3 years:

Organizational Design

1. Notifications;
2. Staff Mobilization; and
3. Ability to Operate within the response management system described in the plan.

Operational Response

4. Discharge control;
5. Assessment of discharge;
6. Containment of discharge;
7. Recovery of spilled material;
8. Protection of sensitive areas; and
9. Disposal of recovered material and contaminated debris.

Response Support

10. Communications;
11. Transportation;
12. Personnel support;
13. Equipment maintenance and support;
14. Procurement; and
15. Documentation.

Tesoro will evaluate the components that are applicable from the list above, and add or delete other components as appropriate. Tesoro will endeavor to exercise all components of the plan within each 3-year exercise cycle. The required exercises should be developed to ensure that each component is addressed and exercised in the triennial cycle. Tesoro is responsible for documenting the components completed in the exercise.

In the triennial cycle, the following exercises must be conducted:

- 12 Qualified Individual notification exercises;
- 12 Emergency Procedures exercises;
- 3 spill management team tabletop exercises - one must involve a worst case discharge scenario;

- 3 unannounced exercises - any of the exercises, with the exception of the Qualified Individual notification exercise, if conducted unannounced, would satisfy this requirement; and
- 6 equipment deployment exercises.

**Exercise Records**

Drills and exercises will be documented on the *Tesoro Exercise Documentation Form* (Figure 1.8-1). Tesoro will ensure that records, sufficient to document the exercises for pipeline personnel and the spill management team, are maintained for a minimum of five years following the completion of each exercise. Proper documentation for self-certification should include, at a minimum, the following information:

- The type of exercise.
- Date and time of the exercise.
- A description of the exercise.
- The objectives (i.e., core components) met by the exercise.
- Lessons learned.

Objectives are established for each drill and exercise. A critique is conducted following completion of the exercise. Small-scale drills and exercises are critiqued by the refinery Contingency and Emergency Response Coordinator (CERC) with input from the participants. The critique is then electronically distributed to all of the participants involved. For large-scale drills and exercises (e.g., the annual tabletop exercise), participants are asked to fill out a *Self-Assessment Form* following the exercise. The form is used to identify strengths in the refinery's oil spill preparedness/response plans and procedures; areas that can be strengthened; and things that could be done to enhance prevention, preparedness, response to, and recovery from the potential emergencies that the refinery's organization may face. Information from the *Self-Assessment Forms* is then transferred to a *Crisis Management Team Tabletop Exercise Form*, shown on Figure 1.8-2, which is electronically distributed to all of the participants and discussed at the refinery Strategic Leadership Committee (SLC) meeting.

Actual emergency response incidents fulfill applicable drill requirements provided that a post-spill critique is conducted and shared with the organization, and the incident is properly documented.

### 1.8.5 Records Retention

The Pipeline Manager and refinery CERC maintains all drill, exercise, and emergency response incident critiques on file for at least five years. The documentation must be in writing and signed by a Qualified Individual. Records of exercises will be maintained on file at the Dickinson office and made available to PHMSA Inspectors.

**Figure 1.8-1**
**Exercise Documentation Form**

## TESORO EXERCISE DOCUMENTATION FORM

Exercise/Incident Name: _____ Exercise Date: _____

Exercise/Incident Location: _____ Date Prepared: _____

TYPE OF EXERCISE:

1. ☐ Notification Exercise (Internal) ☐ Governmental Initiated (External)
   ☐ Emergency Procedure Exercise (Internal) ☐ Area Exercise (External)
   ☐ Spill Management Team Tabletop Exercise (Internal) ☐ Announced
   ☐ Equipment Deployment Exercise (Internal) ☐ Unannounced
2. Date and Time Performed: Start: _____ am End: _____ pm
3. Exercise or Actual Event? ☐ Exercise ☐ Actual Event
4. Unified Command implemented? ☐ Yes ☐ No

RESPONSE CATEGORY:

5. ☐ Average Most Probable Discharge
   ☐ Maximum Most Probable Discharge
   ☐ Worst Case Discharge
   Actual Size: ☐ Simulated _____ bbls. ☐ Real _____ bbls.

QUALIFIED INDIVIDUAL NOTIFICATION EXERCISE

6. A. Name of Qualified Individual: _____ Title: _____
   B. Is Qualified Individual identified in Contingency Plan? ☐ Yes ☐ No
   C. Notification method: Telephone ☐ Pager ☐ Radio ☐ In Person ☐ Other ☐
   D. Did notification procedure follow C-Plan? ☐ Yes ☐ No

SPILL MANAGEMENT TEAM TABLETOP EXERCISE:

7. A. Describe objectives and how they were exercised:

   _____

   B. Descriptions of lessons learned:

   _____

EQUIPMENT DEPLOYMENT EXERCISE:

8. A. Equipment Ownership: Facility ☐ OSRO ☐ Both ☐
   B. Provide attachment listing Equipment and Personnel:
   C. Was equipment deployed in its intended operating environment? Yes ☐ No ☐
   D. Describe objectives and how they were exercised:

   E. Descriptions of lessons learned:

   _____

   F. Is Spill Response Equipment in a Preventative Maintenance Program Yes ☐ No ☐

## Figure 1.8-1 (continued)
## Exercise Documentation Form

### TESORO EXERCISE DOCUMENTATION FORM (Cont.)

**EMERGENCY PROCEDURES EXERCISE:**

**9. A. Describe objectives and how they were exercised:** _____

_____

**B. Descriptions of lessons learned:** _____

_____

**CORE REQUIREMENTS:**

**10.**
- ☐ Notifications
- ☐ Staff mobilizations
- ☐ Response Management System:
  - ☐ Unified Command
  - ☐ SMT Operations
- ☐ Discharge Control
- ☐ Assessment
- ☐ Containment
- ☐ Recovery
- ☐ Protection of Sensitive Areas
- ☐ Disposal
- ☐ Communications
- ☐ Transportation
- ☐ Personnel Support
- ☐ Equipment Maintenance
- ☐ Procurement
- ☐ Documentation

**ADDITIONAL COMMENTS**

**11.**

**LIST OF ATTACHMENTS:** **(Area exercise package only)**

**12.**
- ☐ Incident or Scenario and Objective of exercise/Incident
- ☐ ICS 201 Initial Incident Briefing
- ☐ List of Equipment Operational Problems
- ☐ Incident Action Plan
- ☐ Critique/Lessons Learned
- ☐ Tesoro Exercise Evaluation

**CERTIFICATION:**

| | |
|---|---|
| Signature of Tesoro Representative | Company |
| Signature of OSRO Representative (if present) | Company |
| Signature of Federal Agency Representative, FOSC (if present) | COTP Zone |
| Signature of State Agency Representative, SOSC | Office |

**Prepared By:** **Position:** **Phone:**

**Figure 1.8-2**
**Exercise Documentation Form**

TESORO

# CRISIS MANAGEMENT TEAM TABLETOP EXERCISE

## RESPONSE CATEGORY

☐ Announced ☐ Unannounced

☐ Average Most Probable Discharge ☐ Maximum Most Probable Discharge ☐ Worst Case Discharge

☐ Simulated _____ bbls ☐ Real _____ bbls

## PREP CORE REQUIREMENTS COMPLETED THIS CALENDAR YEAR

- ☐ Notifications
- ☐ Staff Mobilization
- ☐ Response Management System
  - ☐ Unified Command
  - ☐ SMT Operations
- ☐ Discharge Control
- ☐ Assessment
- ☐ Containment
- ☐ Recovery
- ☐ Disposal
- ☐ Communications
- ☐ Transportation
- ☐ Protection of Sensitive Areas
- ☐ Personnel Support
- ☐ Equipment Maintenance
- ☐ Procurement
- ☐ Documentation

## EXERCISE OBJECTIVES

_____

## LESSONS LEARNED

## SELF-CERTIFICATION

Signature _____ Date _____

*Attachments on file with refineryContingency Planning and Emergency Response Coordinator, Tesoro Mandan Refinery*

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## 1.9 RESPONSE PLAN UPDATES

### 1.9.1 Plan Availability and Use

This Pipeline Response Plan has been prepared by the Tesoro Manager of Contingency Planning in San Antonio, Texas. The Contingency Planning and Emergency Response Coordinator (CERC) will retain the master copy of this OSCP and the plan distribution list.

Copies of the Response Plan will be distributed to the PHMSA, and other interested parties. A copy of this Response Plan will be kept in the Dickinson office where it will be immediately available for inspection or use. A record of plan distribution will be maintained by the Manager of Contingency Planning.

The Pipeline Manager will review the Response Plan with the Field Specialist periodically, use the Plan during spill response drills, and practice policies which are described in this Response Plan to assure that all personnel are familiar with the Plan.

### 1.9.2 Routine Plan Updates

This Response Plan will be reviewed annually by the Pipeline Manager and the CERC to ensure that plan information is current.

Changes, when made, will be recorded on the "Record of Revisions" log sheet in the Introduction of this Plan. Changes will be issued in numerical sequence. Plan holders will be notified of changes or revisions with a letter that identifies the revision number, date, section numbers, and page numbers. Replacement copies of the affected pages will be provided. Each transmittal letter should be attached to the Plan directly following the log sheet.

It will be the responsibility of each plan holder to ensure that all updates are promptly incorporated into their copy of the Response Plan. All plan holders are encouraged to immediately advise the Pipeline Manager of any needed corrections which come to their attention.

### 1.9.3 Plan Amendments

This Pipeline Response Plan is not intended to be a static document. It will be reviewed and amended as necessary whenever changes in facility operations occur. Key factors that may cause revisions to the response plan are listed below. Tesoro will submit revisions for these key factors to PHMSA within 30 days:

- The revision of applicable regulations;
- An extension of the existing pipeline, or construction or purchase of a new pipeline in a response zone not covered by the previously approved plan;
- Relocation or replacement of the pipeline in a way that substantially affects the information included in the response plan, such as a change to the worst case discharge volume;

- The type of oil transported, if the type affects the required response resources, such as a change from crude oil to gasoline;
- The name of the oil spill removal organization;
- Emergency response procedures;
- The qualified individual;
- A change in the NCP or an ACP that has significant impact on the equipment appropriate for response activities;
- Any other information relating to circumstances that may affect full implementation of the plan;
- A change in the facility's operating area that includes ports or geographic areas not covered by a previously approved plan;
- The identity, capability, or availability of the response resources identified and available by contract or other approved means changes;
- The Plan fails during an emergency response or drill;
- Pipeline ownership or management changes;
- The potential worst case discharge spill volume increases substantially; or
- PHMSA determines that the plan does not meet the requirements and a written notice of the deficiencies is made.

If no other revisions occur, this Pipeline Response Plan will be resubmitted within five years of the previous submission or approval. Plan revisions that affect only the response personnel names or telephone numbers do not require resubmission for re-approval. However, all registered plan holders will periodically be sent these revisions.

Plan holders will be notified, in writing, as soon as possible (and/or within 24 hours) of any significant change which could affect implementation of this OSCP, including a substantial decrease in available spill response equipment.

### 1.9.4 Post Spill Review

Following drills, or an actual spill, the response effort and the Pipeline Response Plan will be reviewed and evaluated to ensure a continued preparedness to respond. Using the objectives (i.e., core components) identified in Section 1.8, Tesoro will conduct a debrief meeting and solicit the observations of the responders, including government members of the Unified Command, to determine how well the objectives were achieved. This analysis will be summarized in a written report and used to determine recommendations for corrections or improvements, and a schedule for their implementation. A periodic management-level review will be conducted to ensure application of the appropriate lessons learned. Copies of reports generated following drills or actual spills will be made available for agency inspection at the Dickinson Office.

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# PART II
# RESPONSE MANAGEMENT

As a result of an infinite number of combinations of environmental conditions, no two spills will be identical. Each spill must be evaluated on the basis of incident-specific conditions. Therefore in lieu of identifying individual protection and cleanup measures applicable only to the anticipated scenarios, several methods are described. By providing alternatives, the responders will be able to chose the methods most applicable to each situation. Protective action procedures are described in detail in Sections 2.1, 2.2 and 2.3.

Historically a number of cleanup techniques have been developed to recover spilled oil from water and shorelines. Selection of the proper technique is dependent on several variable, site specific conditions discussed in Section 2.4.

Cleanup of oil from the water's surface is generally accomplished with skimmers, vacuums and sorbents, once the oil has been contained, as described in Section 2.5.

For shorelines and other terrestrial areas, the surface conditions and topography of oiled areas and the manner in which the oil has been deposited will dictate the choice of cleanup procedures to be followed. The cleanup of affected areas should commence immediately after emergency control actions have been completed. The basic cleanup techniques are presented in Section 2.6.

Incident objectives, strategies and tactics for each operational period are described in the Incident Action Plan (IAP). Forms used in the preparation of the IAP are presented in Section 2.7.

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## 2.1 PROTECTIVE ACTION PROCEDURES

Sections 2.2 and 2.3 provide descriptions of the implementation for various protective action procedures. Based on incident specific information, the responder can choose the most appropriate technique or combination of techniques. The techniques and procedures described in these Sections are intended to be flexible, and the responder is encouraged to modify the techniques as necessary to meet site-specific criteria.

### 2.1.1 Protection Priorities

To the degree possible, all threatened resources will be protected. Where time or resources will not permit response to all situations (such as in major spills), the following guidelines may be used to delegate efforts for maximum resource protection on a day-to-day basis in response to events as they unfold in the field.

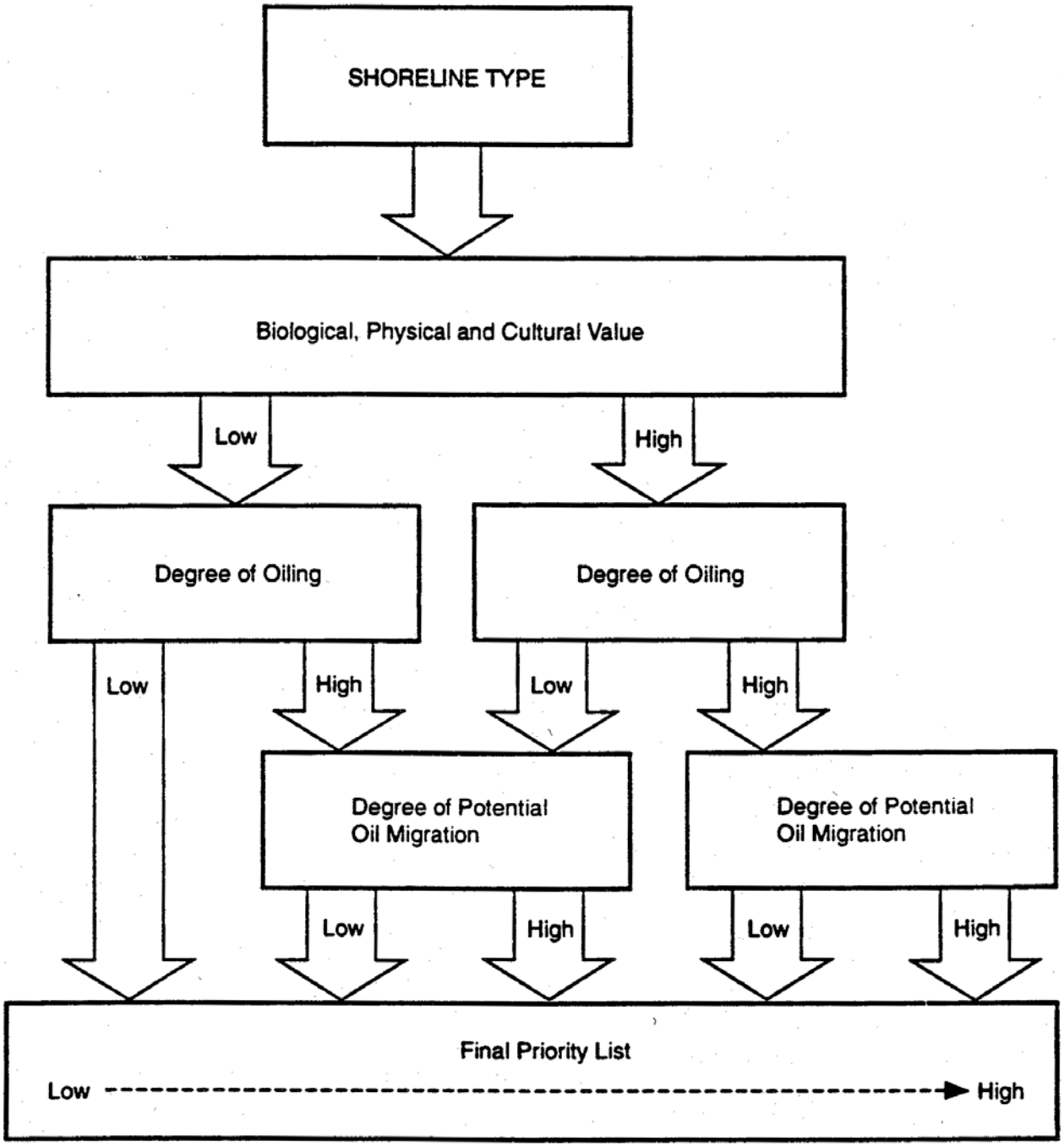
In cases where resources have not yet been impacted, the setting of response priorities based on spill movement, identification of sensitive areas, and consideration of the feasibility of protective actions is relatively straight forward. When available response time permits, sensitive areas that can reasonably be protected should be treated in the order of relative sensitivity or vulnerability. The basic sequence of considerations for the determination of response priorities is indicated in the priority guide, Guide 2-1.

In cases where resources have already been impacted and continued oiling is anticipated, priority judgments become less clear. Generally, if a highly sensitive and/or vulnerable resource has been only lightly oiled, its normal response priority should be maintained. If such a resource has been heavily oiled and a resource of similar value is threatened, response priority should shift to the yet unoiled resource.

**Protection Method Selection**

As a result of the infinite number of combinations of environmental conditions, no two spills will be identical. Each spill must be evaluated independently on the basis of incident- specific conditions. Therefore, in lieu of identifying specific protection measures, the following subsections provide the decision-making criteria for evaluating and selecting the appropriate protection procedures. The specific protective action procedures referenced by the decision diagrams are presented in this section.

# Guide 2-1
# Priority Guide



**Inland and Coastal Waters.** Protective actions include those efforts intended to prevent spilled oil from entering a receiving water body and efforts to minimize damage once such water bodies have been impacted. Selection of an appropriate protection technique for an inland or coastal area depends on the following factors:

- Type of water body (e.g., inland waters - lakes, rivers, etc.; coastal waters - bays, tidal channels, open water)
- Velocity of water currents
- Land form and water body configurations (e.g., straight coastline, harbor or bay entrance, etc.)
- Depth of the water
- Presence of breaking waves
- Amount of oil

Guides 2-2 through 2-4 are decision guides for evaluation of the factors affecting the use of a protection technique, and selection of the appropriate technique(s) for the particular conditions.

**Decision Guide Use.** The decision guides are divided into three categories: protection of coastal waters, protection of inland waters, and protection of terrestrial areas. They are used as follows:

- For coastal waters (Guide 2-2) enter the figure at the configuration of the area to be protected and select the appropriate booming technique(s) depending on the presence of breaking waves and the velocity of water currents.
- For inland waters (Guide 2-3), enter the figure at the type of water body where protection is needed and select the appropriate booming technique(s) depending on the amount of oil contamination and the water current speed (except for shallow waters). For a large lake where water currents and/or waves are present, use the decision guide for coastal waters (Guide 2-2).

In any location (inland and coastal waters) where currents exceed 3 knots or breaking waves are greater than 1 foot, it is best to move the proposed boom location away from turbulent waters into a more quiescent area along the water body.

- For terrestrial areas, selection of appropriate protective techniques is dependent on the following factors:
  - Nature of the substrate
  - Slope of terrain
  - Amount of oil
  - Available time

Guide 2-4 is a guide for evaluating the protective technique most appropriate in consideration of substrate and slope only. The amount of oil and the time parameter reflect the reality of constructing

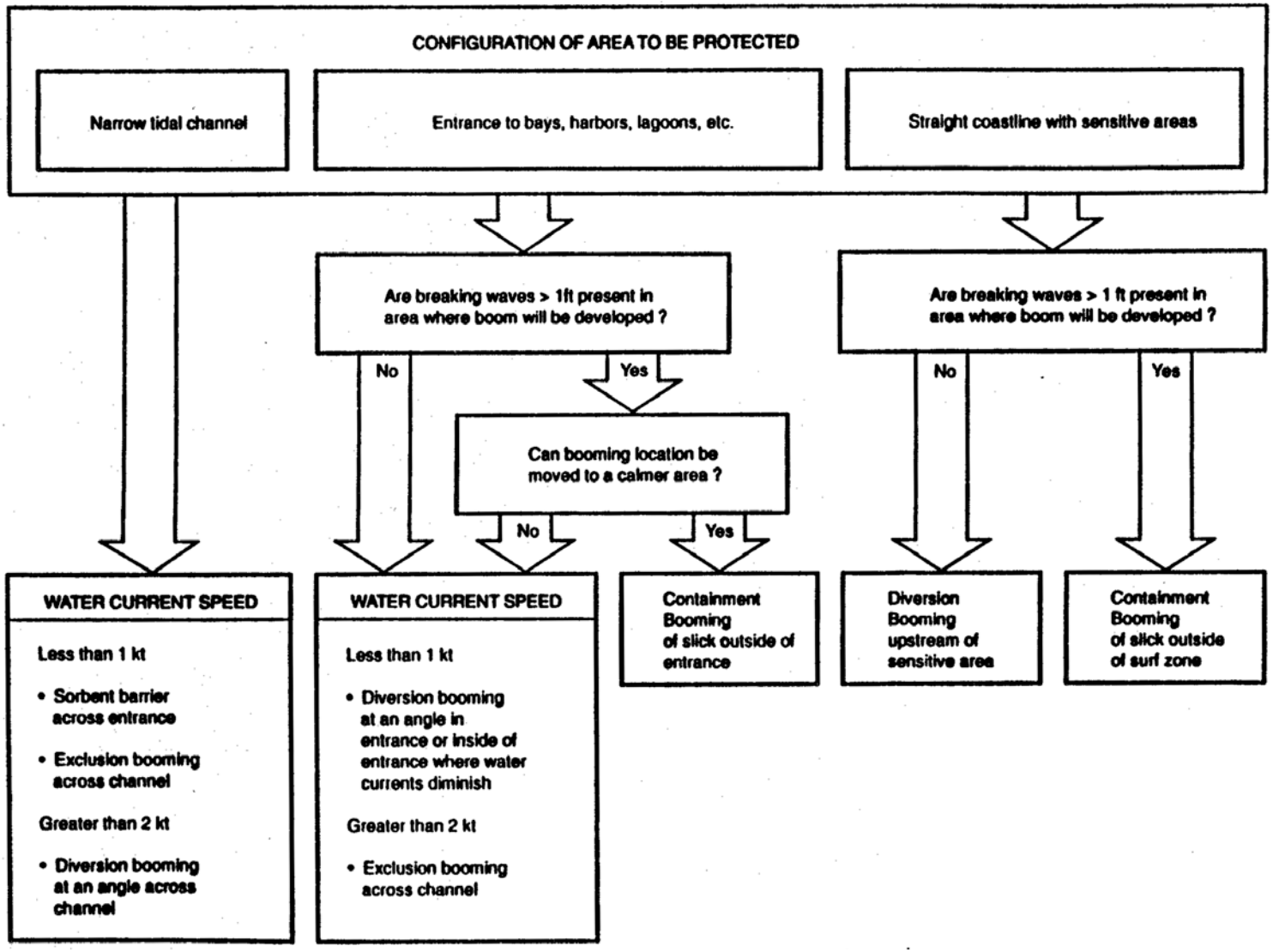
a barrier of appropriate size in the time available. These factors can only be judged in the field at the time of the incident. Should it be impossible to implement the recommended method at a desired point due to a lack of time, a new control point will be selected further downslope. If protection is still impossible and human safety is in question, the threatened area will be evacuated.

Once a protection technique has been selected, the implementation requirements should be checked. Instructions on how each technique should be used are given in Sections 2.2 and 2.3.

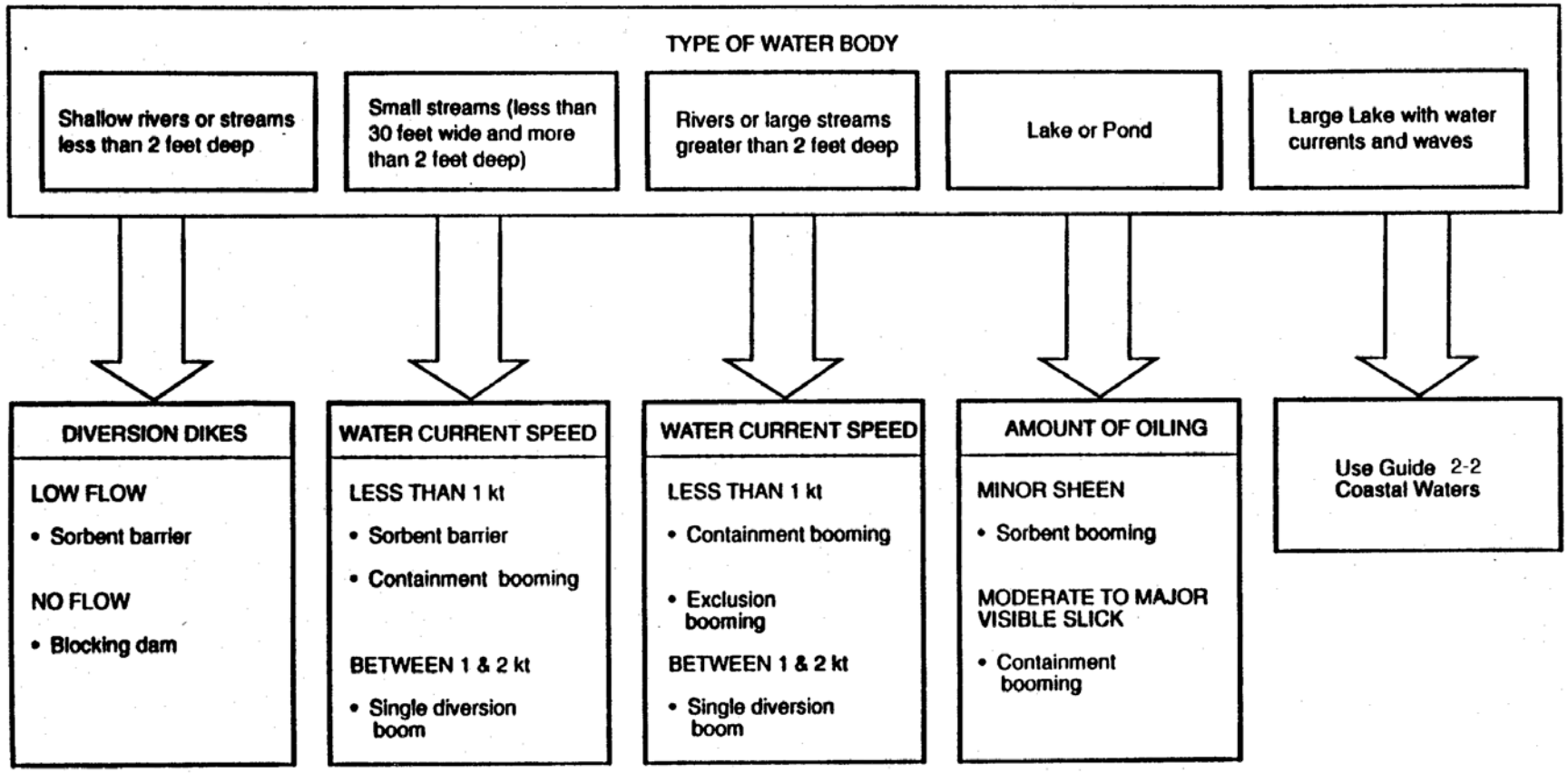
### 2.1.2 Sensitive Area Maps

Sensitive area maps are presented in Appendix E.

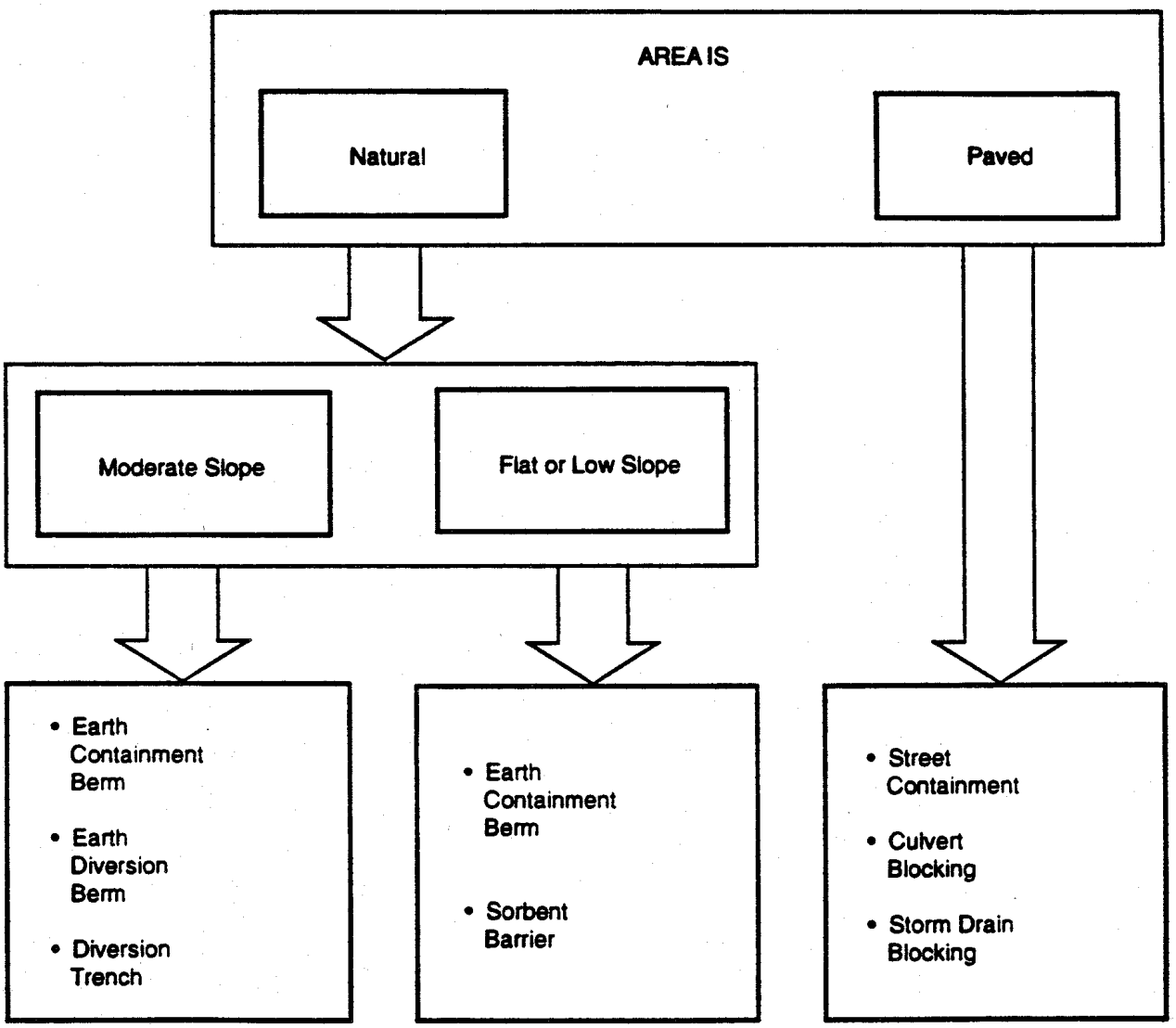
# Guide 2-2
# Open (Coastal Waters)



# Guide 2-3
# Inland Waters



# Guide 2-4
# Terrestrial Areas



## Environmental Sensitivity Maps

The following pages contain 12 Environmental Sensitivity Maps that identify the Highly Populated Areas, Ecological HCAs, Urban Areas, Drinking Water HCAs, and other populated areas along the Missouri River from the Tesoro Mandan Refinery to Fort Yates.

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## 2.2 BERMS, DAMS AND BARRIERS

### 2.2.1 Blocking Dams

**Use**. Dams are constructed across streambeds, ditches, or other dry drainage courses to block and contain any flowing oil and to prevent oil migration during a rising tide.

**Limitations**. Accessibility, implementation time, adequate storage behind the dam, flowing water, and the availability of construction materials.

**General Instructions**. Dam locations should have high banks on the upstream side with the dam well-keyed into the banks.

Construct the dam using on- or near-site earthen materials, sandbags, plywood sheets, or any material that blocks the flow of oil (Figure 2.2-1). Excavate earthen materials from the upstream side to increase storage capacity if necessary. Oil is recovered from behind the dam by pumping or using vacuum trucks. Plastic sheeting should be placed over the dam to prevent oil penetration and erosion.

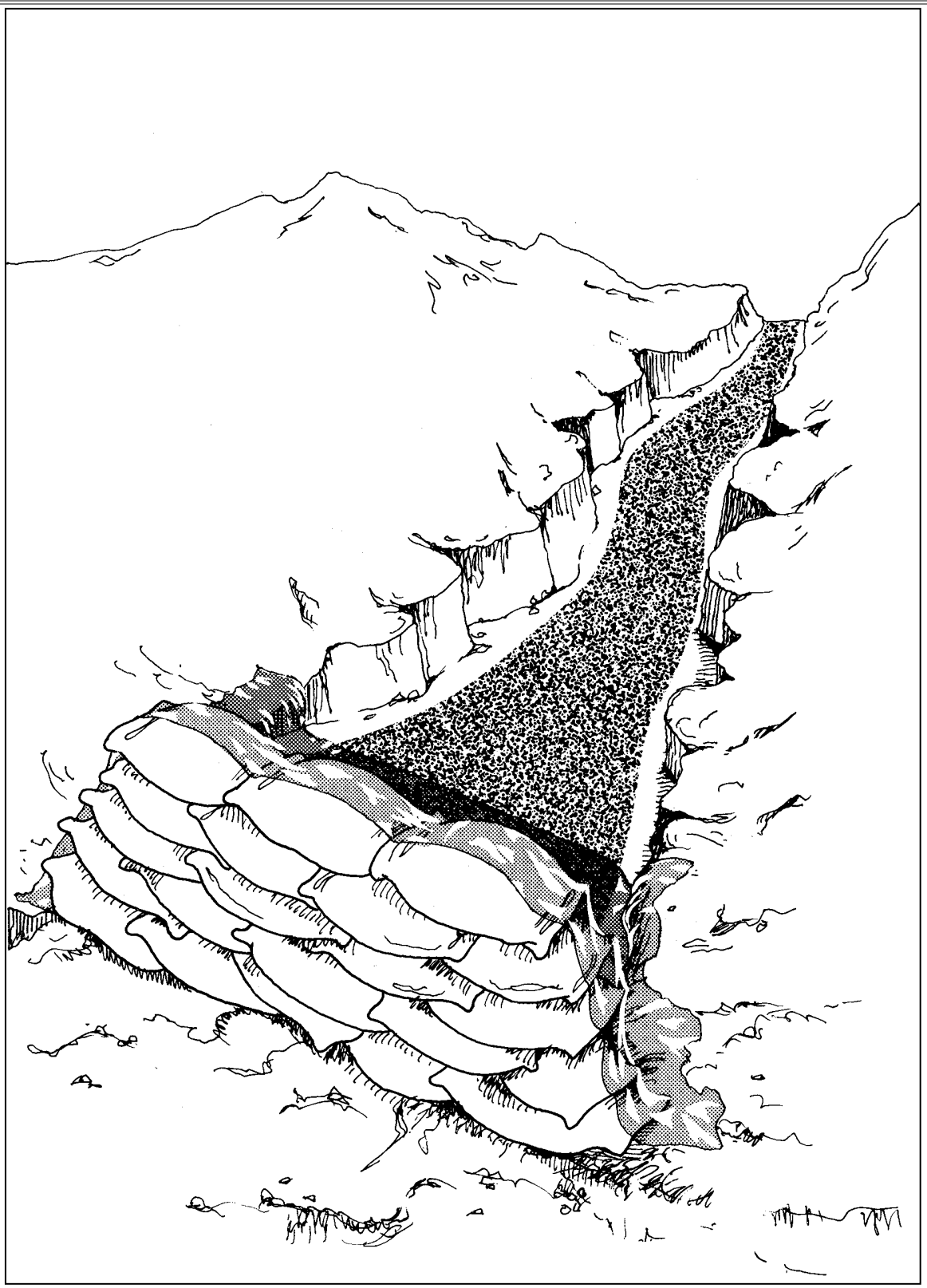
**Equipment Required**. Bulldozer, front-end loader, backhoe, or hand tools; sand bags, plywood and plastic sheeting.

**Maintenance**. Periodically check the dam for leaks, structural integrity, and excessive oil buildup.

**Cleanup**. Recover remaining oil concentrations or sheen with sorbents. Remove or treat oiled sediments. Dismantle the dam or replace earthen materials in excavation site.

**Variations**. Containment area behind the dam can be water flooded to limit oil penetration into sediments.

**Figure 2.2-1**
**Sandbag Blocking Dam**



## 2.2.2 Flowing Water Dams

**Use**. Dams are constructed across culverts, ditches, shallow streams, etc., to contain floating oil while not obstructing the water flow.

**Limitations**. Accessibility, implementation time, availability of dam materials, water depth, and high current velocities.

**General Instructions**. Dam locations should have high banks on the upstream side with the dam well-keyed into the banks. Construct dam with on- or near-site earthen materials, such as sandbags, plywood sheets, etc. If necessary, use heavy equipment or manual labor to excavate materials from the upstream side to increase dam storage capacity. Make the upstream side impermeable with plastic sheeting, if required. Underflow dams utilize inclined or valved pipes that have a flow capacity greater than the stream flow rate. Place valved pipe(s) on the streambed and build a dam on top. Adjust the valve opening(s) until a constant water/oil level is achieved behind the dam. Inclined pipes are placed in the dam at the lower end of the upstream side. The height of the raised end determines the water level behind the dam. Both techniques are illustrated in Figure 2.2-2A.

For overflow dams, water flows over the top of the dam and booms positioned be-hind the dam contain the floating oil. Construct the dam as described above and cover it with plastic sheeting to prevent erosion. Anchor the boom several feet behind the dam (Figure 2.2-2B). Pumps or siphons can also be used to pass water over the dam. To be effective, the pumping rate should be greater than the stream flow rate. These techniques are depicted in Figures 2.2-2C and D.

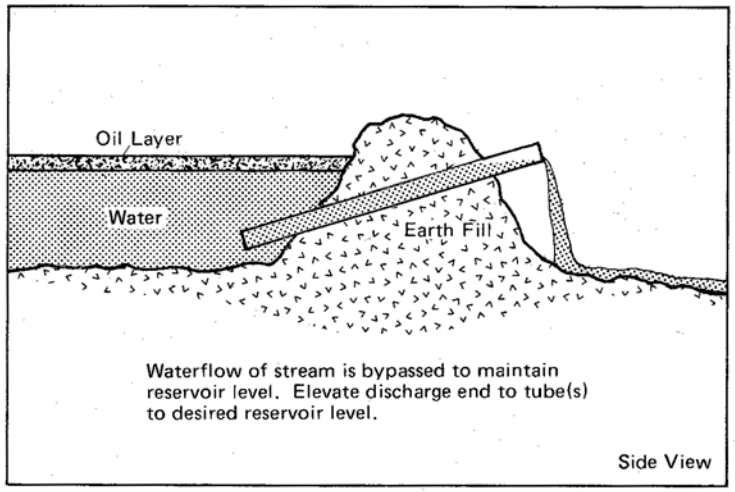
**Equipment Required**. Front-end loader, bulldozer, backhoe, pipes, pumps, hoses and hand tools.

**Maintenance**. Check dam periodically for leakage and integrity, replace eroded materials, and continually monitor water/oil level. Valved pipes, pumps, or a number of siphons may require periodic adjustment to compensate for changes in the stream flow rate.

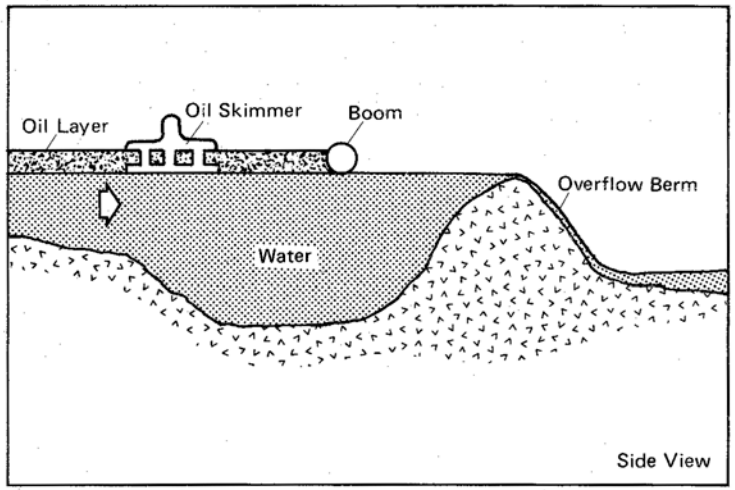
**Cleanup**. Remaining sheens are recovered with sorbents and dam materials are returned to borrow sites. Refer to Section 2.6 for shoreline cleanup techniques.

**Variations**. None.

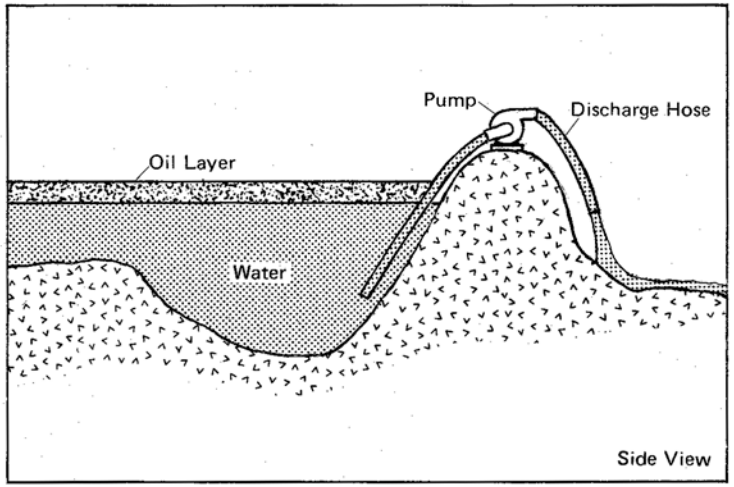
**Figure 2.2-2**
**Flowing Water Dams**



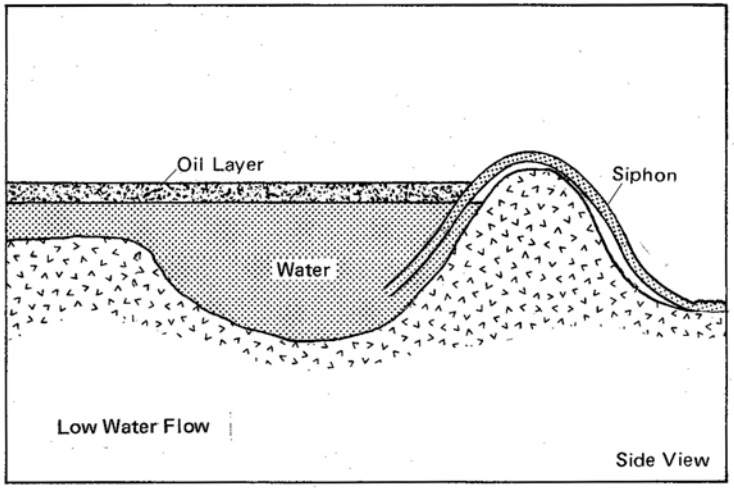

A. Underflow dam




B. Overflow berm




C. Overflow dam with pump




D. Overflow dam with siphon

### 2.2.3 Sorbent Booms/Barriers

**Use**. Sorbent booms or barriers constructed with fencing and sorbent materials are used to contain and recover oil floating on creeks, streams, or tidal channels. They are also effective when deployed behind skimmers to pick up oil that escapes skimmers.

**Limitations**. Implementation time, large quantities of oil, high current velocities, and excessive water depth for barriers.

**General Instructions**. Deploy sorbent booms across the waterway with each end anchored to the shore. Position each successive boom a few feet downstream from the previous boom.

Construct single-sided barriers by driving a line of posts into the stream bottom with wire mesh screen fastened to the upstream side. Place oil snare squares in front of the screens and the current will hold them in place. In tidal channels with reversing currents, construct a double-sided barrier. As depicted in Figure 2.2-3, erect two parallel lines of posts across the channel and attach screen along each line of posts. Place oil snare in the area between the screens to trap floating oil and oiled debris.

Screen height for both types of barriers must be sufficient to prevent the scattering of loose sorbent from above or beneath the barrier as tidal flow levels change. The screen mesh must be compatible with the type and size of filler sorbent and able to withstand prevailing currents.

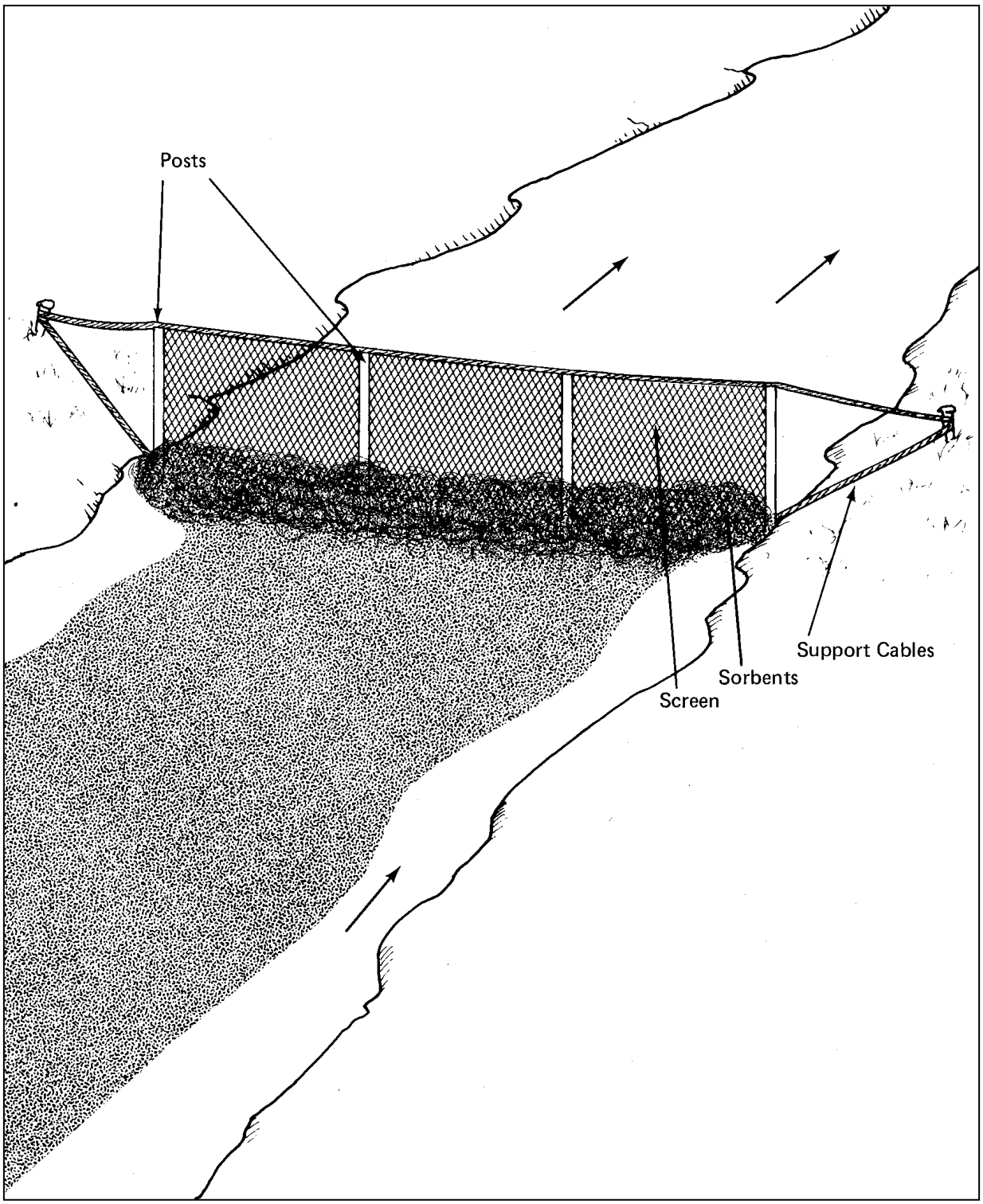
**Equipment Required**. Hand tools, rope.

**Maintenance**. Turn booms or sorbents regularly for maximum absorbency and replace them when they are completely saturated with oil. Check booms and barriers periodically for leakage or damage.

**Cleanup**. Store used sorbents in leak-proof containers.

**Variations**. If significant quantities of oil are to be encountered, construct multiple barriers. Recover oil pooling behind the barrier by skimming, pumping, or using sorbents.

**Figure 2.2-3**
**Sorbent Barrier (Water)**



## 2.2.4 Earth Containment Berms

**Use**. Low barriers constructed with available materials (e.g., earth, gravel, sandbags, etc.) are used to contain surface oil flow on relatively flat or low-sloped terrain or wetlands.

**Limitations**. Accessibility, implementation time, highly permeable soils and low-viscosity oils, and environmental damage inflicted by excavation of berm materials.

**General Instructions**. Use earthmoving equipment or manual labor to construct berms by forming materials into windrows or ridges in a "horseshoe" configuration. Width of containment opening should exceed that of the leading edge of the oncoming oil. Berm height and the size of the containment area are dependent upon the physical characteristics of the oil.

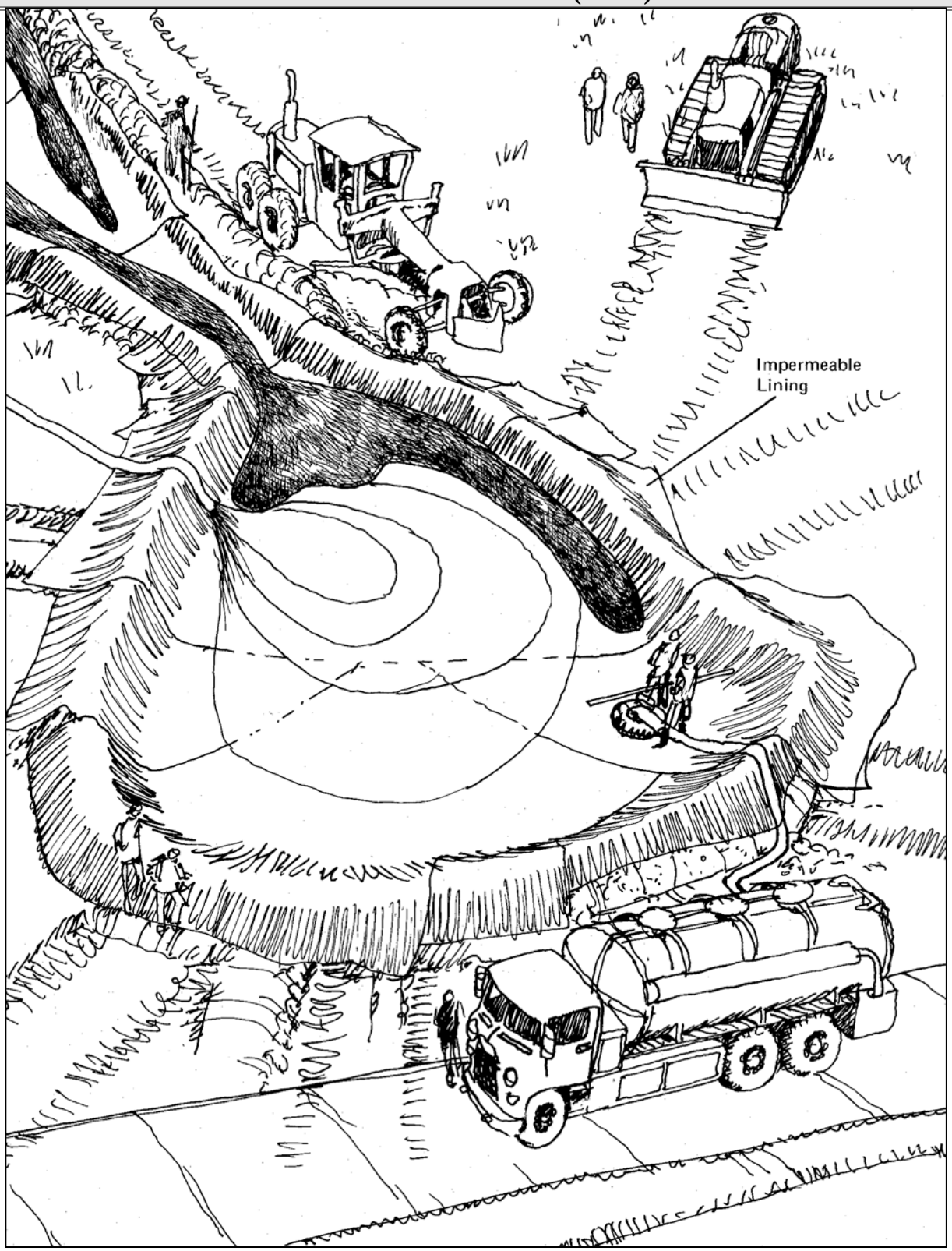
**Equipment Required**. Motor graders, bulldozers, front-end loaders, and/or hand tools.

**Maintenance**. Check berms periodically for leakage and adequate height.

**Cleanup**. Use sorbents to recover residual oil pools. Remove or treat oiled sediments. Backfill excavated area upon completion of cleanup operations.

**Variations**. In areas with a high ground-water table or high soil permeability, the containment area may be flooded and/or lined with plastic sheeting to inhibit soil penetration. Oil can be recovered from the water surface by skimming. This technique is shown in Figure 2.2-4 and may be useful in controlling oil movement through secondary wetland drainages or wetland fringes. Earth containment berms can minimize surface disruption and restore normal circulation when cleanup has been completed.

**Figure 2.2-4**
**Earth Containment Berm (Lined)**



## 2.2.5 Street/Pavement Containment

**Use**. Barriers constructed across streets or paved areas can be used to contain oil flowing onto urban streets or highways.

**Limitations**. Storage behind barriers, implementation time, and the availability of recovery equipment.

**General Instructions**. Construct barriers with sandbags, soil, or gravel. If coarse materials are used, the upslope side should be made impermeable with plastic sheeting or similar material. Barrier height should equal curb height. If no curb is present, construct the barrier in a "horseshoe" shape. Should a greater storage area be needed, a diversion barrier can be constructed at an angle across the street to direct oil into a parking lot or open field where a larger containment barrier has been constructed (Figure 2.2-5).

In constructing containment barriers, care must be exercised to minimize potential fire hazards. To avoid causing sparks, the blades of earthmoving equipment should not scrape the pavement, if present. The exhaust and ignition systems of on-scene motorized equipment should be shielded. (Spark arresters and elevated exhaust will be required on all equipment; use diesel-powered equipment when available.)

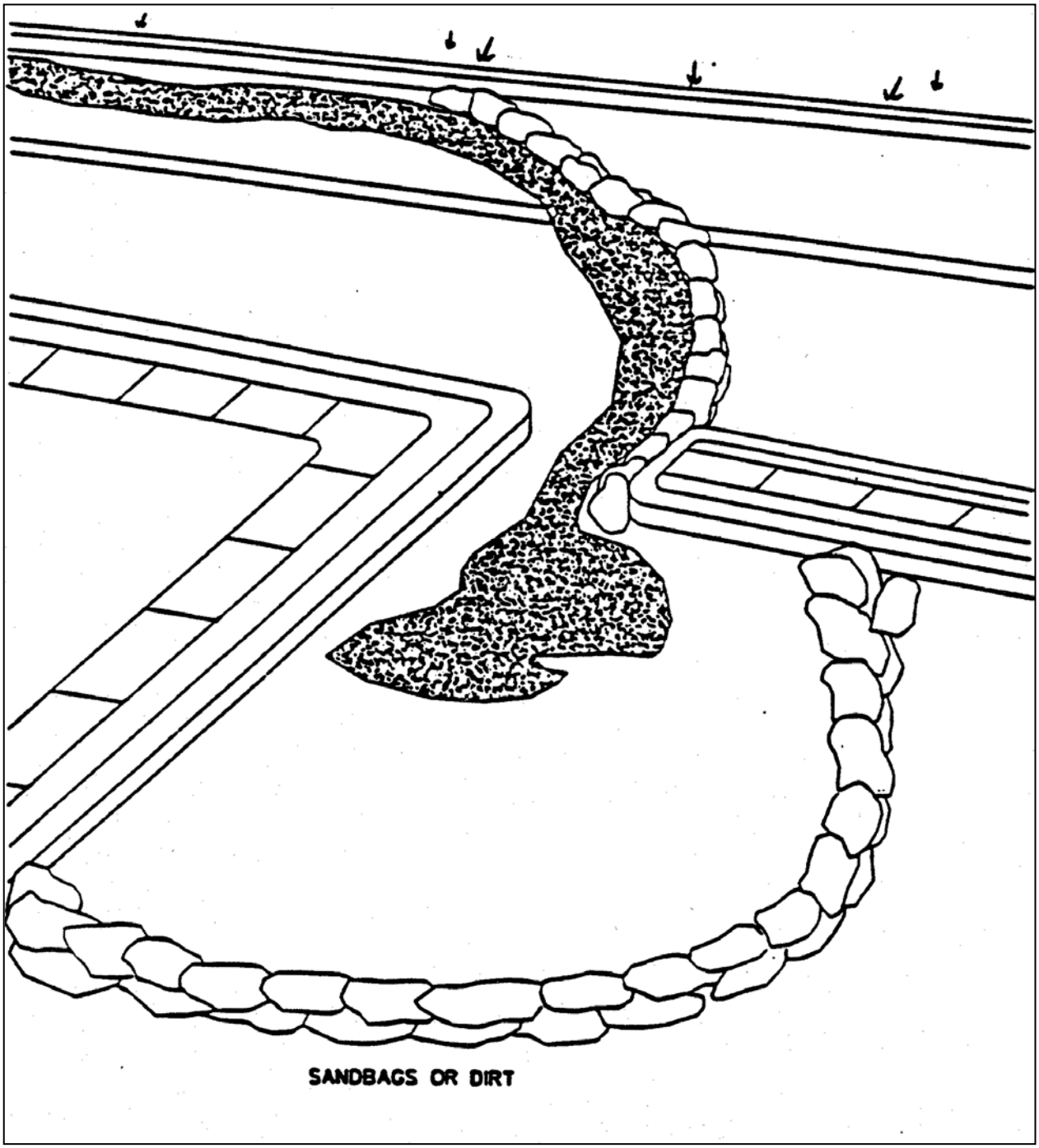
**Equipment Required**. Front-end loader, hand tools and/or sandbags.

**Maintenance**. Periodically check barrier for leakage and adequate height.

**Cleanup**. Oiled areas should be flushed with water. Direct the spray towards the containment site where the oil can be skimmed or pumped out. Oiled barrier materials must be removed for disposal. Remaining oil can be removed with sorbents.

**Variations**. The area behind the barrier may be flooded with water in order to float the oncoming oil. This makes recovery easier and prevents further surface oiling.

**Figure 2.2-5**
**Dam on a Large Paved Area**



## 2.2.6 Culvert Blocking

**Use**. Boards, sandbags, inflatable plugs, or earthen materials are used to block culverts as a means of containing oil flowing into ditches, creeks, or other drainage courses that feed into culverts. Culvert blocking may also be used to prevent oil from entering tidal channels that are connected to the ocean through culverts.

**Limitations**. Accessibility, implementation time, storage area behind culvert, flowing water, and culvert size.

**General Instructions.** Block the culverts by piling dirt, sand, or similar material over the upstream end of the culvert, thereby creating a containment dam. Sandbags or plywood sheets are also effective (Figure 2.2-6). Inflatable plugs work best if available at the site.

**Equipment Required.** Front-end loader and/or hand tools.

**Maintenance**. Periodically check culvert for leakage.

**Cleanup**. Remove or treat oiled sediments using techniques described in Appendix D and remove the block from the culvert.

**Variations**. If water is flowing into a drainage ditch, it can be removed by pumping or siphoning to the culvert outlet or a near-by drainage course.

If there is little or no storage area upslope from a culvert, it may be advantageous to permit the oil to pass through the culvert and to contain the spill at the culvert out-fall. In areas where a culvert outfall discharges into a borrow ditch, the borrow ditch can be dammed to form a storage area for the spilled oil. If there is no borrow ditch or similar structure draining the culvert outfall, a storage area can be created by constructing a horseshoe-shaped dam around the outfall (Figure 2.2-7).

**Figure 2.2-6**
**Culvert Blocking**

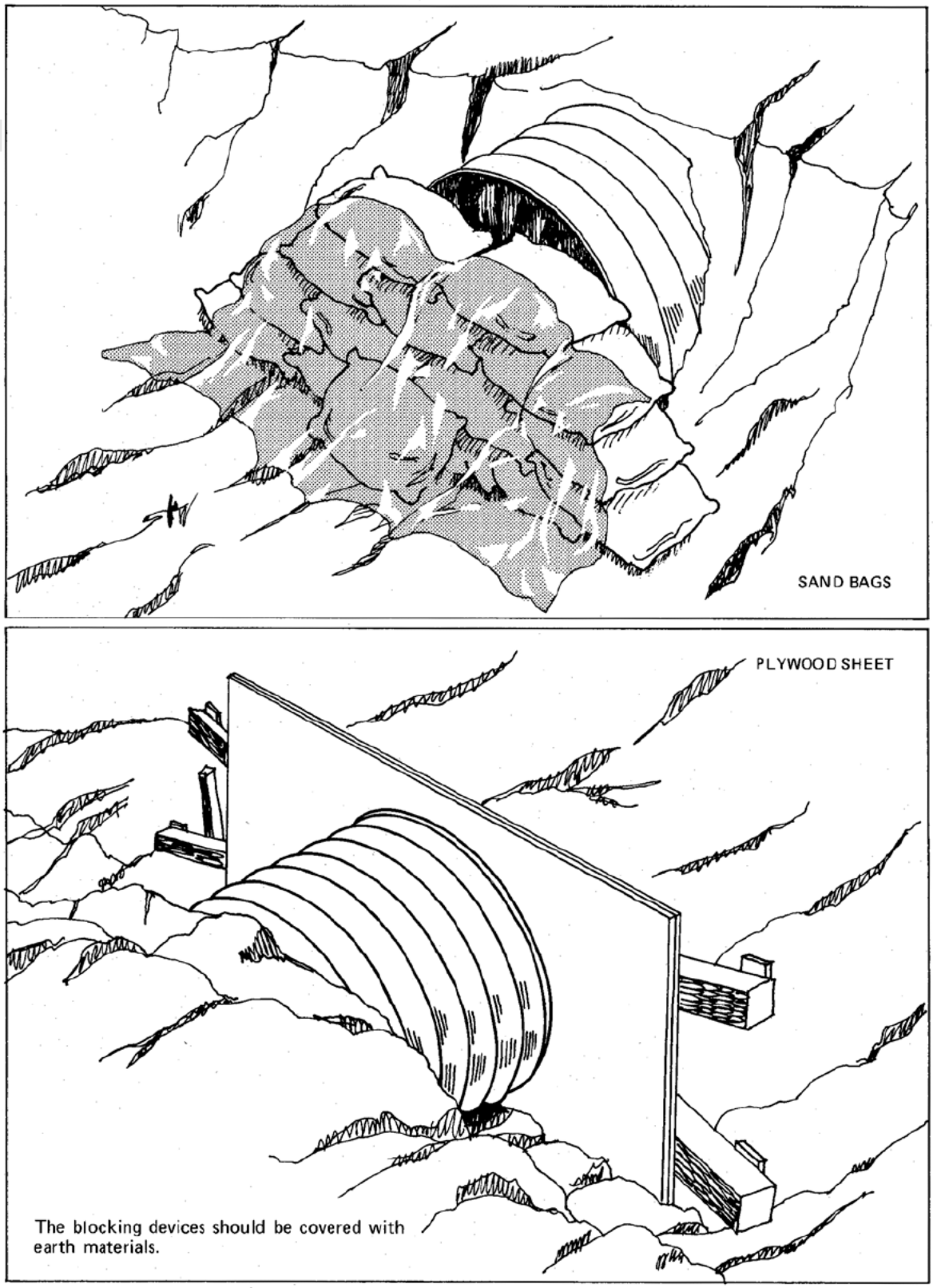
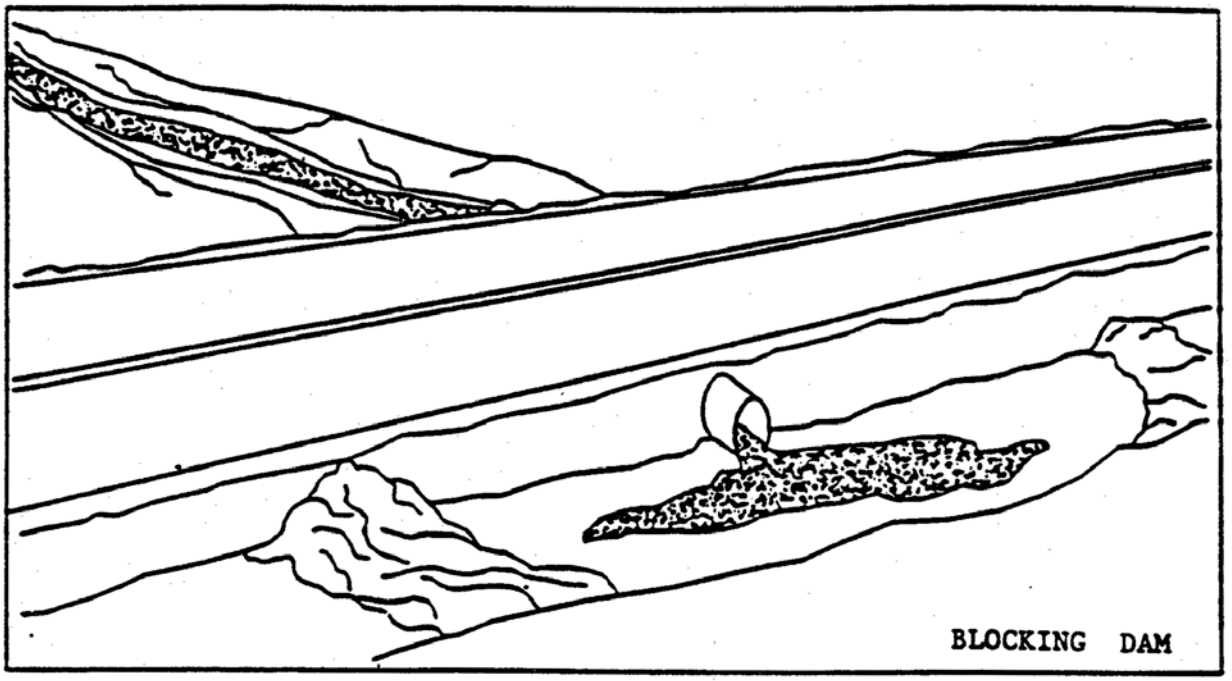
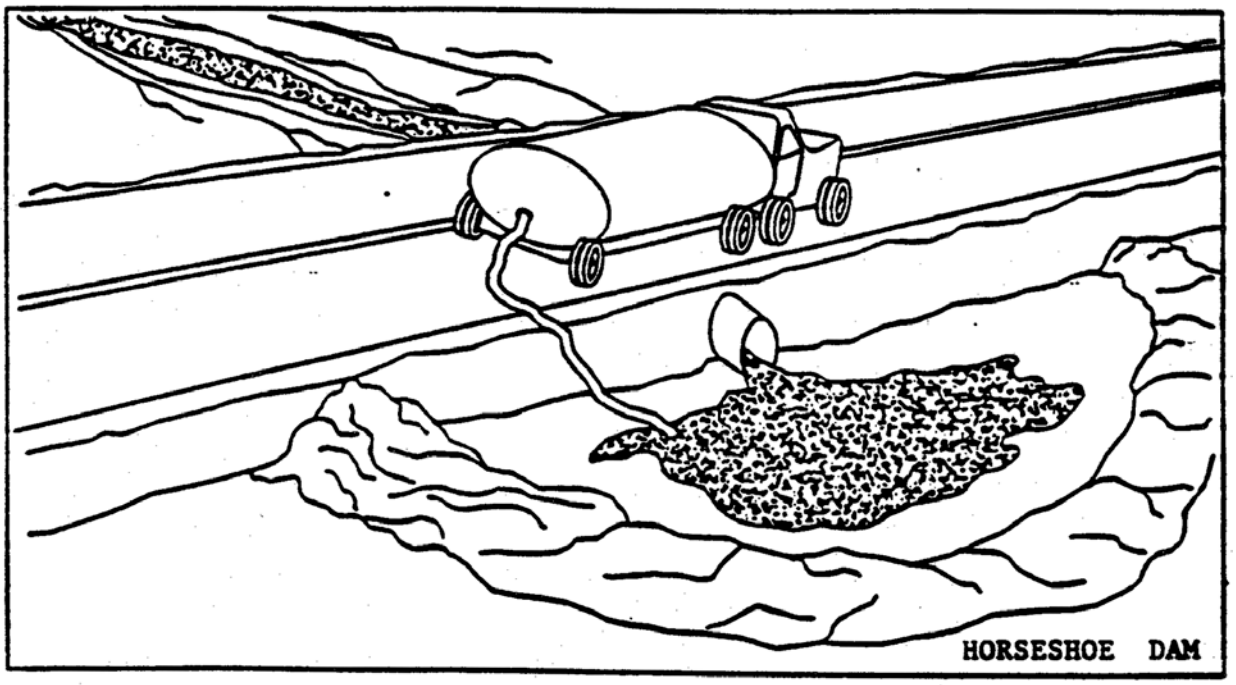


**Figure 2.2-7**
**Damming Flow at Borrow Ditch**



## 2.2.7 Storm Drain Blocking

**Use**. Sandbags, boards, and specially constructed mats are used to prevent oil spilled on roadways from entering urban storm drains.

**Limitations**. Implementation time.

**General Instructions**. For curb inlets, position a board over the curb inlet and hold it in place with a sandbag. Street inlets can be blocked similarly with a board or plastic sheeting. Both inlet-blocking techniques are illustrated in Figure 2.2-8. Specially constructed mats can be used expeditiously if they are kept on hand.

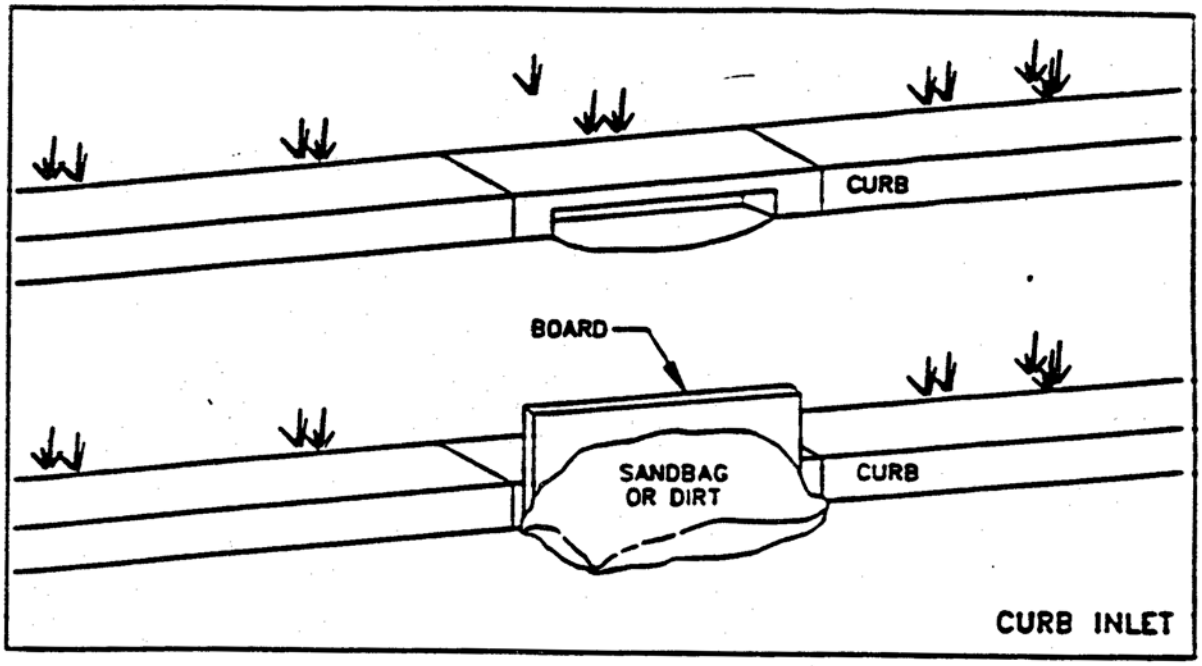
**Equipment Required**. Sandbags, plywood, plastic sheeting.

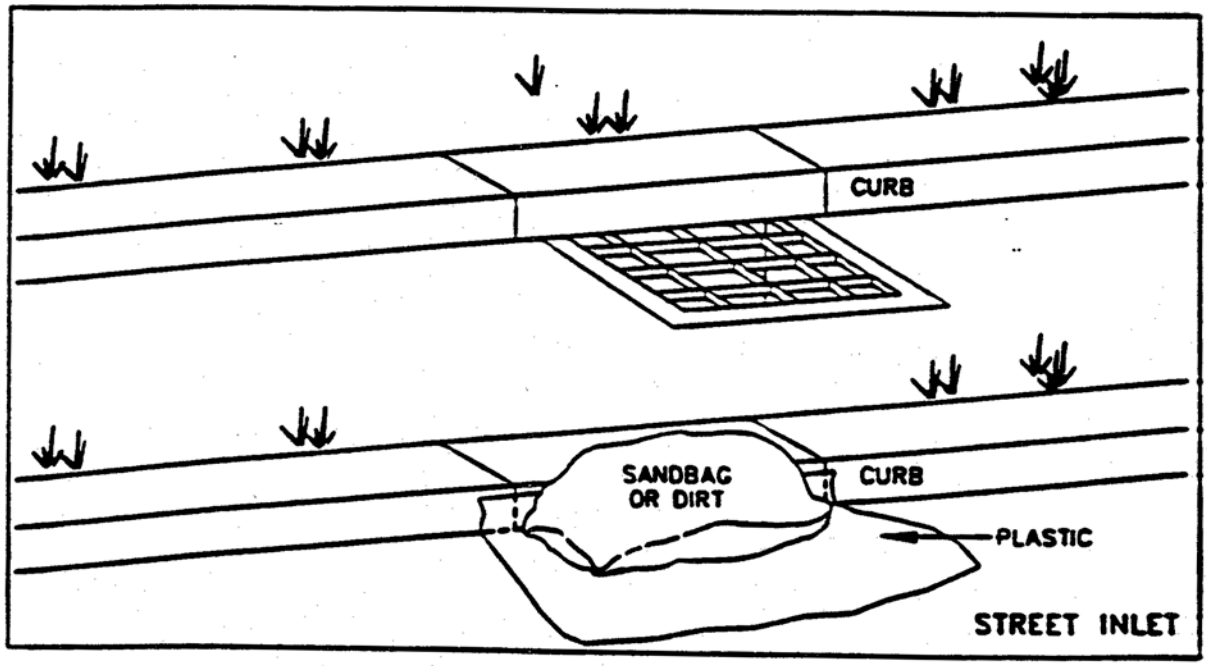
**Maintenance**. Periodically check for leak-age.

**Cleanup**. Water-flush streets to remove remaining oil. Remove blocking materials from storm drains.

**Variations**. Other materials may be used to block inlets.

**Figure 2.2-8**
**Storm Drain Blocking Techniques**



## 2.2.8 Sorbent Barrier

**Use**. Low barriers constructed of sorbents stacked on the ground are used on relatively flat or low-slope terrain to contain minor oil flows and recover a portion of the oil. Sorbents used in this manner also tend to immobilize oil and can be used to limit penetration into permeable soils.

**Limitations**. Implementation time, steep slopes, and cleanup/disposal problems.

**General Instructions**. Stack or pile sorbents to form a continuous barrier across the entire leading edge of the advancing oil mass with the ends curved toward the on-coming flow. A sorbent barrier is shown in Figure 2.2-9. Collected oil is recovered by physical removal of spent sorbents or by vacuuming or pumping if quantity exceeds absorption capabilities of the sorbents.

**Equipment Required**. No special equipment. Roll and granular sorbents generally work best.

**Maintenance**. Turn sorbents periodically to maximize recovery and replace saturated sorbents. Add additional material as necessary.

**Cleanup**. Place oiled sorbents in leak-proof containers (drums or plastic bags) for disposal. Do not store recovered material onsite. Minimize manpower and surface disruption during cleanup.

**Variations**. Entire spill surface may be covered to immobilize oil.

**Figure 2.2-9**
**Sorbent Barrier (Land)**

## 2.2.9 Diversion Trench

**Use**. Excavated trenches are used to intercept surface oil flows on most terrain types and divert them to recovery points or around sensitive areas.

**Limitations**. Accessibility, implementation time, low-viscosity oils on highly permeable soils, high water table, and environmental damage inflicted by trench excavation.

**General Instructions**. Excavate trench in the desired direction of oil flow. Angle trench slightly downhill to avoid excessive flow backup. Trench must completely intercept the oncoming oil and divert it to the recovery point or well past the sensitive area as shown in Figure 2.2-10. Trench width and depth is volume dependent. Pile excavated materials on downhill side of trench. For relatively flat areas, such as wetlands, trench depth should increase slightly towards recovery or discharge point to maintain adequate flow in that direction.

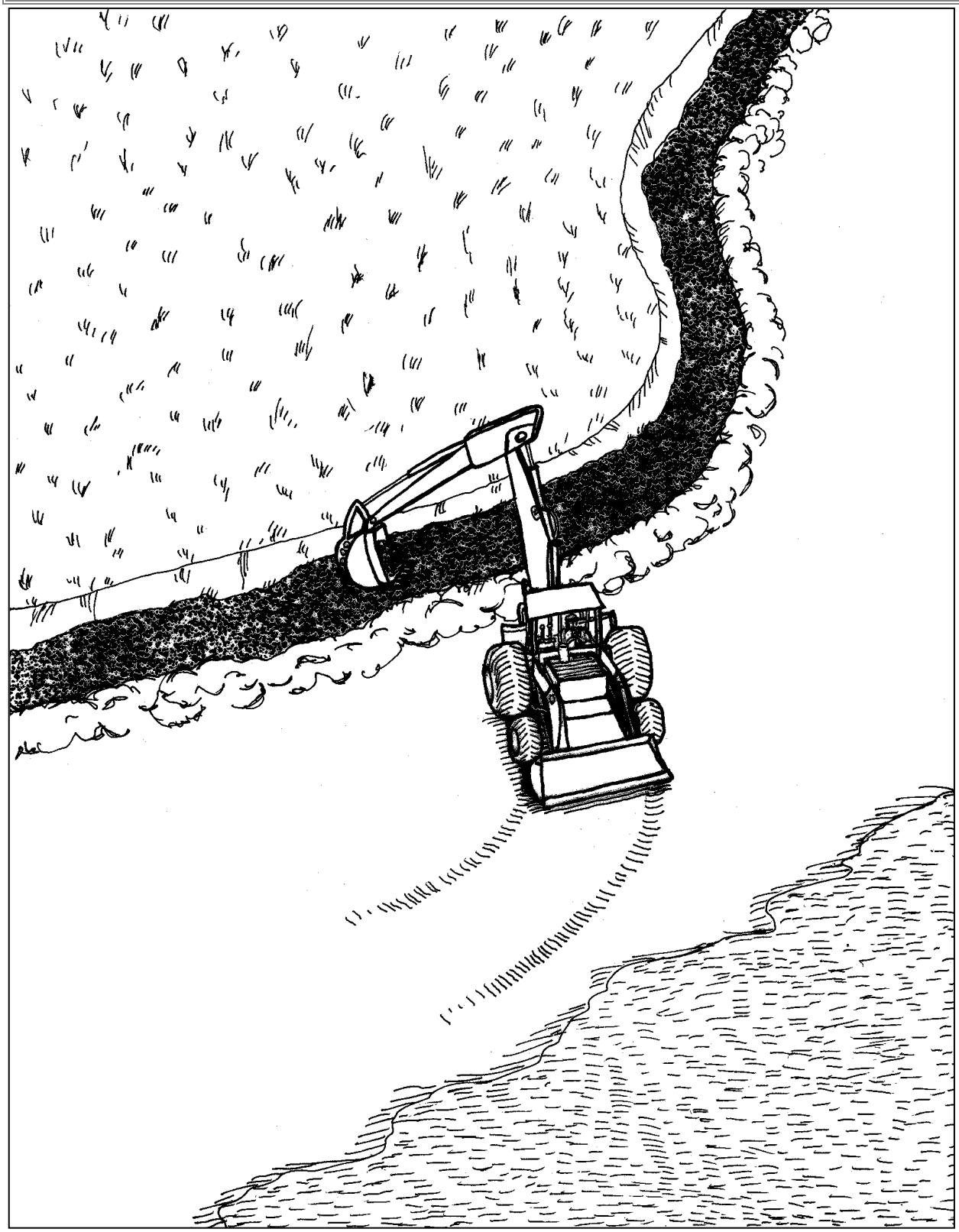
**Equipment Required**. Backhoe, trenching machine, or hand tools.

**Maintenance**. Periodically check for adequate flow, blockages caused by trench walls sloughing in, and debris.

**Cleanup**. Flush trench with water (if applicable), recover remaining oil pools with sorbents, remove or treat soil, and backfill trench.

**Variations**. Partially flood trench with water to inhibit sediment penetration and stimulate flow. Trench can be dug perpendicular to the slope to contain, rather than divert, the oil flow. In tidal wetlands, dig trenches across the mid-intertidal area to intercept incoming oil and/or collect oil draining from back areas. Oil is then diverted to recovery point by increasing the trench depth. Stranded oil can also be drained from back areas by a series of increasing depth trenches.

**Figure 2.2-10**
**Diversion Trench**



## 2.2.10 Earth Diversion Berm

**Use.** Low barriers are constructed of available materials (earth, gravel, sandbags, etc.) to divert oil flows to a recovery point or around a sensitive area. Used primarily on low- to moderate-slope terrains.

**Limitations.** Accessibility, implementation time, rugged terrain, and environmental damage inflicted by berm material excavation.

**General Instructions.** Use earthmoving equipment or manual labor to construct berm(s) by forming materials or placing sandbags in windrows or ridges along the desired path of oil flow. If onsite materials are used, excavate from the downhill side of the berm. Figure 2.2-11 depicts a diversion berm.

**Equipment Required.** Bulldozer, front-end loader, motor grader, or hand tools.

**Maintenance.** Periodically check for berm erosion, leakage, and adequate height.

**Cleanup.** Remove or treat oiled sediments. Recover pooled oil by pumping, vacuuming, or with sorbents. Backfill excavated areas after completion of cleanup operations.

**Variations.** In areas with little gradient, diversion berms can be constructed on each side of oil flow to limit spread and channel oil to a recovery site (e.g., excavated sump or natural depression). Berms constructed along roadways can prevent oil from crossing road and/or divert oil to a recovery site, as shown in Figure 2.2-12.

**Figure 2.2-11**
**Earth Diversion Berm**

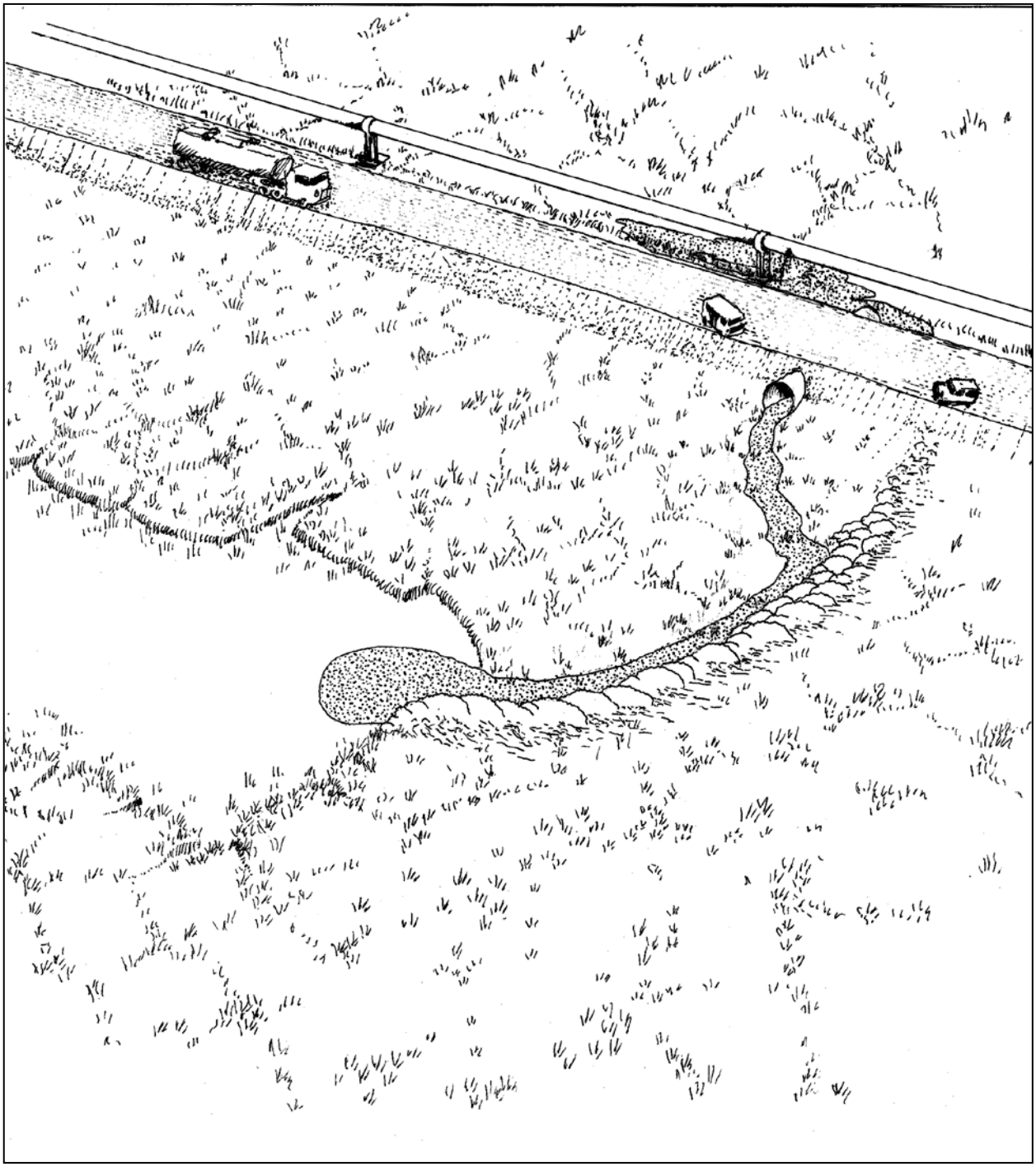
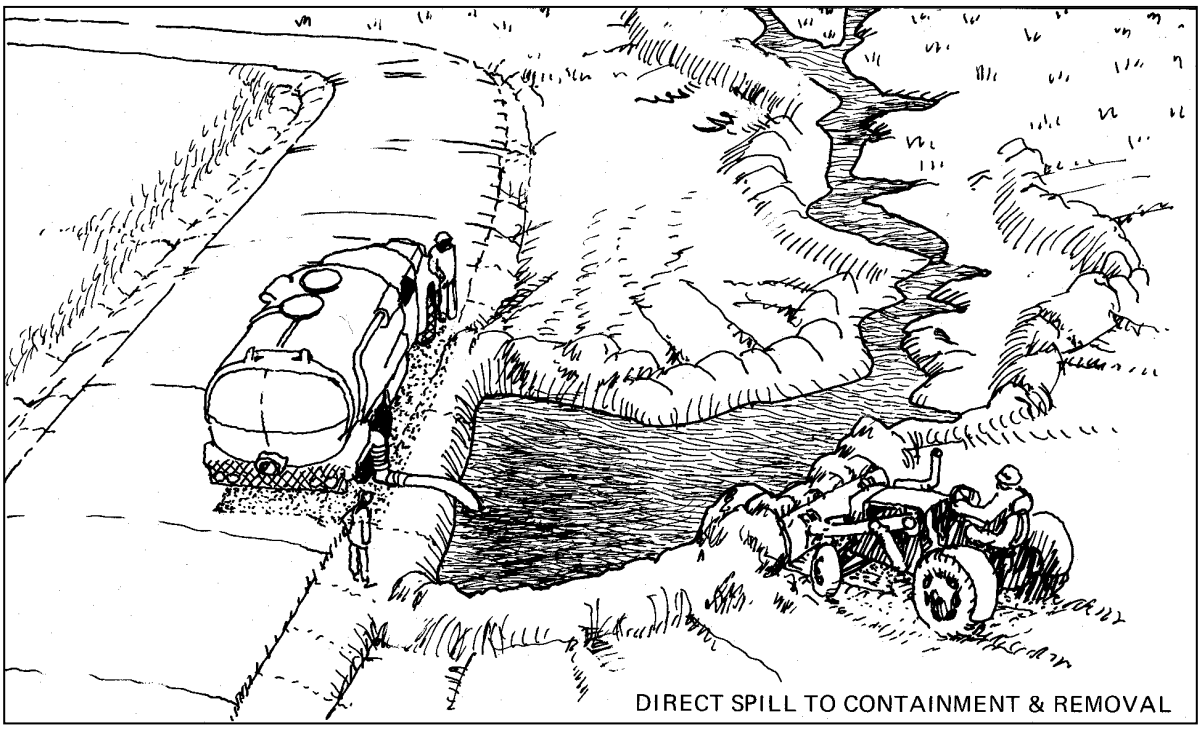
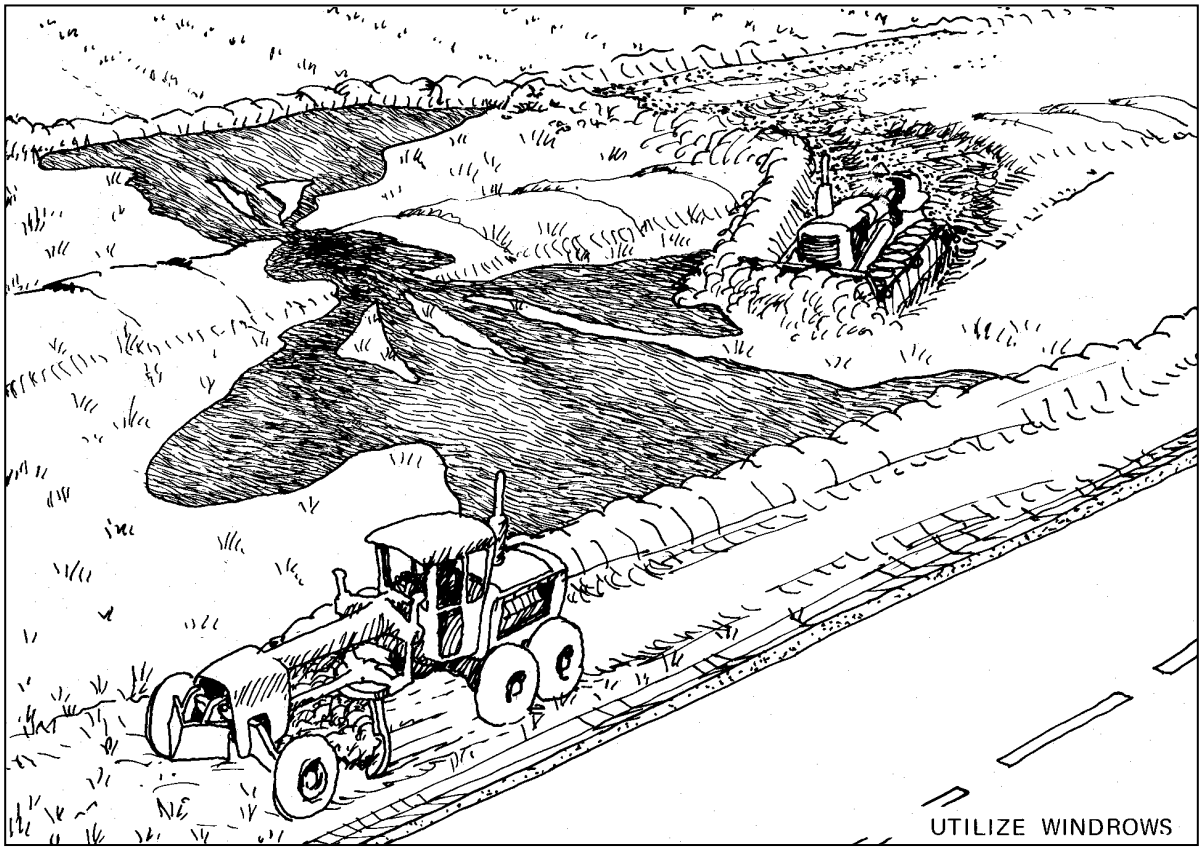


**Figure 2.2-12**
**Alternate Earth Diversion Berm**



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## 2.3 PROTECTIVE BOOMING

### 2.3.1 Calm Water Containment

**Use**. Booms are deployed to encircle and contain oil in calm waters where wind, wave, and current effects are minimal.

**Limitations**. Accessibility and implementation time.

**General Instructions**. Contain oil flowing into a body of water at its entry point. Anchor one end of the boom to the shoreline. Using a boat, pull the other end out around the leading edge of the slick and back to the shore on the other side of the slick, as illustrated in Figure 2.3-1.

Small slicks or patches of oil can be contained by completely encircling them with the boom. Anchor one boom end near the edge of the slick. Pull the other end around the perimeter of the floating oil and attach it to the anchored end.

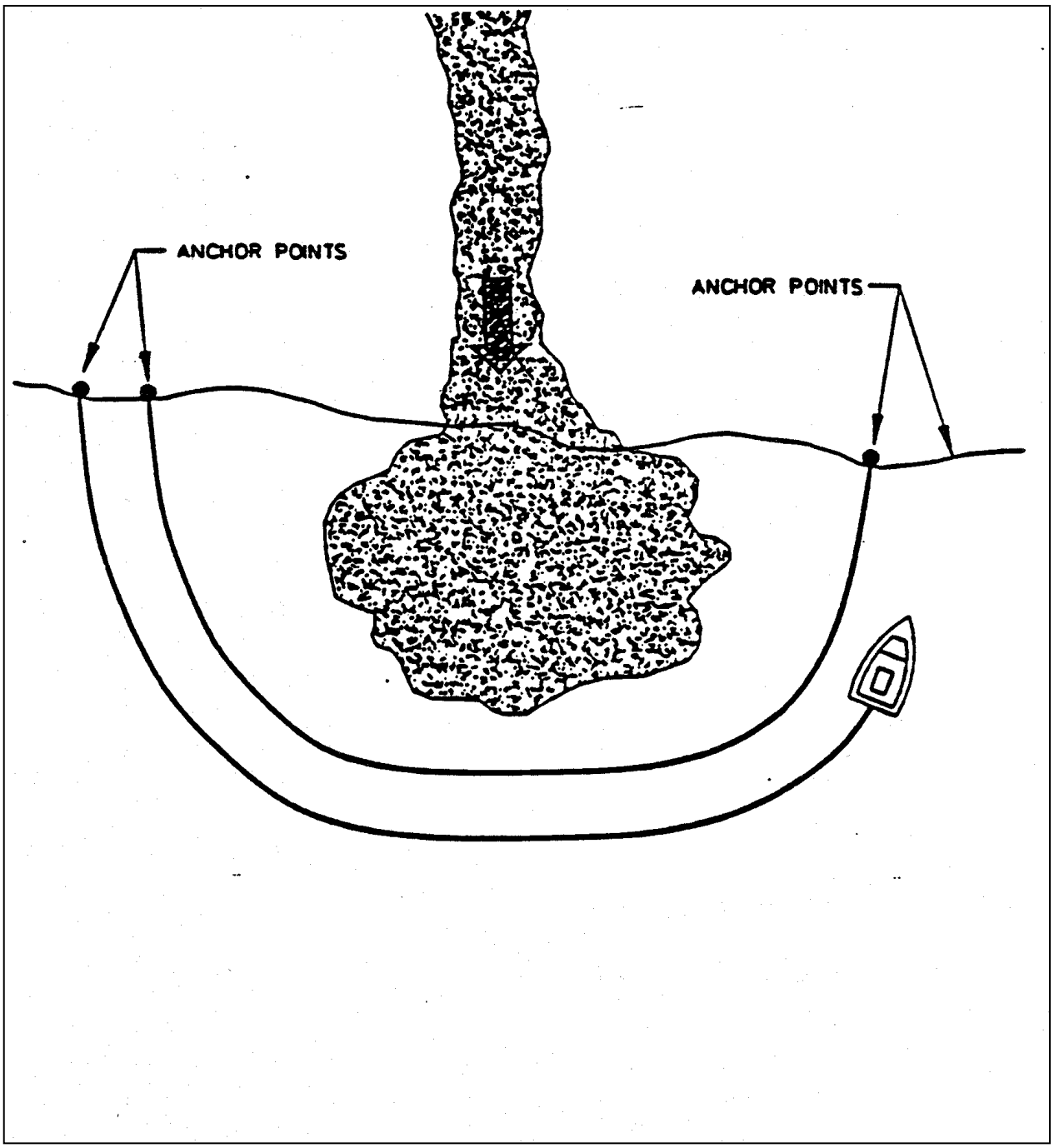
**Equipment Required**. Boat(s) with adequate power to tow the boom, anchors, and hand tools.

**Maintenance**. Check booms periodically for leakage or broken, twisted, or submerged sections.

**Cleanup**. Oil contained within the boom is recovered by skimming. Remaining sheens are removed with sorbents. Refer to Section 2.6 for specific shoreline cleanup techniques.

**Variations**. None.

**Figure 2.3-1**
**Calm Water Containment at Point of Entry**



## 2.3.2 Flowing Water Containment Booms

**Use**. Booms are deployed at an angle across a waterway to contain oil floating downstream for subsequent recovery.

**Limitations**. Accessibility, implementation time, current in excess of 1 knot, and water depths less than 1 foot below the boom skirt.

**General Instructions**. Use the currents to assist in the streaming and placement of the boom. For example, anchor one boom end to the shoreline. Use a boat or winch to pull the free end across the river and anchor it slightly upstream (Figure 2.3-2). The optimum deployment angle depends on current velocity, boom length, and boom stability. In general, boom length should be four times the width of the waterway. As current velocity and boom length increase, the deployment angle relative to the shoreline decreases. To improve boom stability, anchor it in several places.

Remove oil from the downstream end of the boom by skimming, pumping, or using vacuum trucks. A containment pit dug into the shoreline can expedite the containment and recovery process (Figure 2.3-3).

**Equipment Required**. Boat or winch, anchors, backhoe (to dig containment pit), and hand tools.

**Maintenance**. Periodically check the boom for leakage and adjust its placement angle, if necessary. Also, check the boom for twisted, damaged, or submerged sections. Check anchors for security.

**Cleanup**. Remaining sheens are recovered with sorbents. Booms are removed. Refer to Section 2.6 for shoreline cleanup methods.

**Variations**. For fast moving streams, deploy two or more booms from each bank with one positioned slightly downstream from the other. Anchor the free ends so that they overlap slightly past the midstream point. If not enough boom is available, deploy a single boom from the side of the stream with the heaviest concentration of oil or from the outside shore of a bend in the stream where oil concentrates naturally.

**Figure 2.3-2**
**Flowing Water Containment Boom**

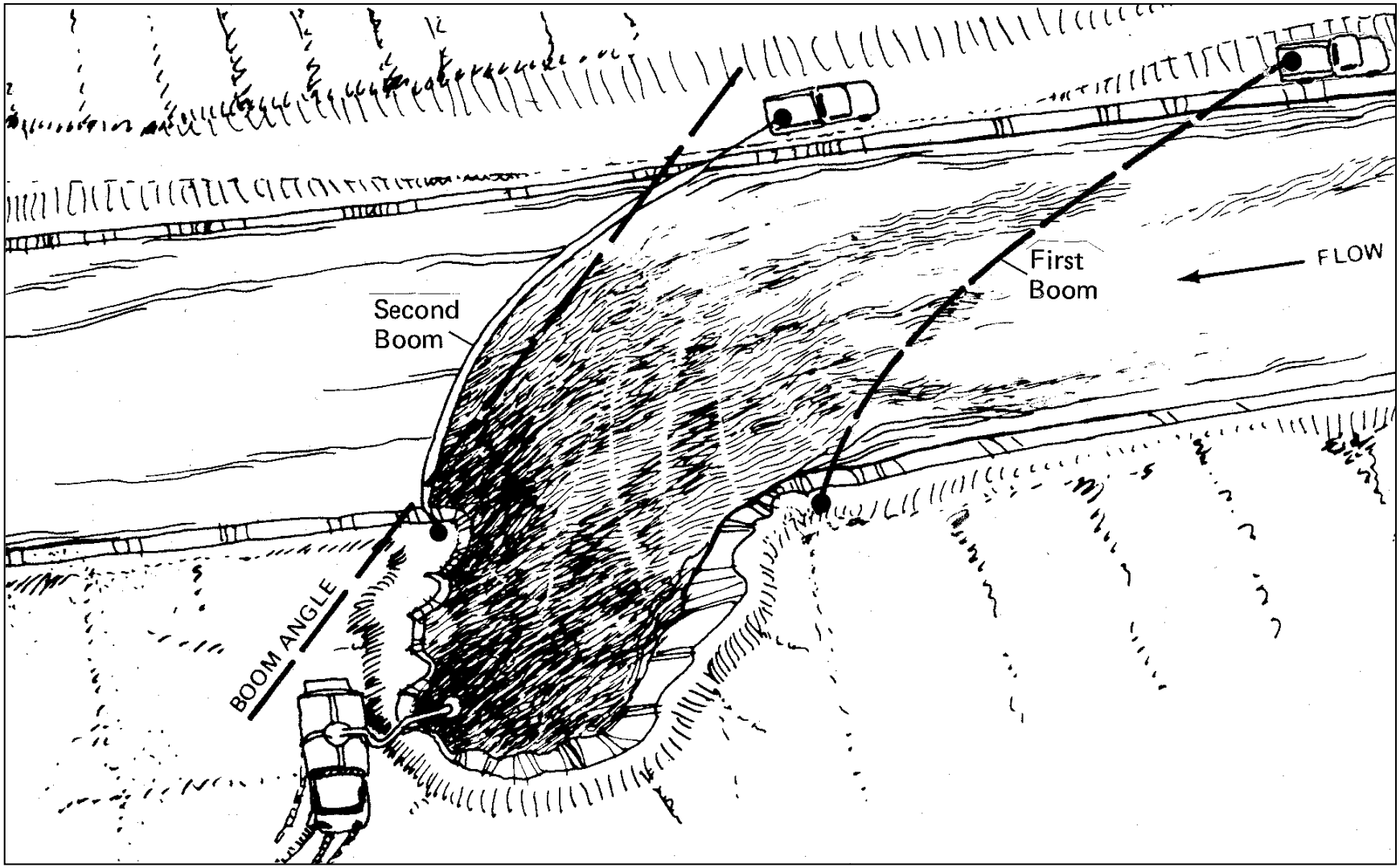
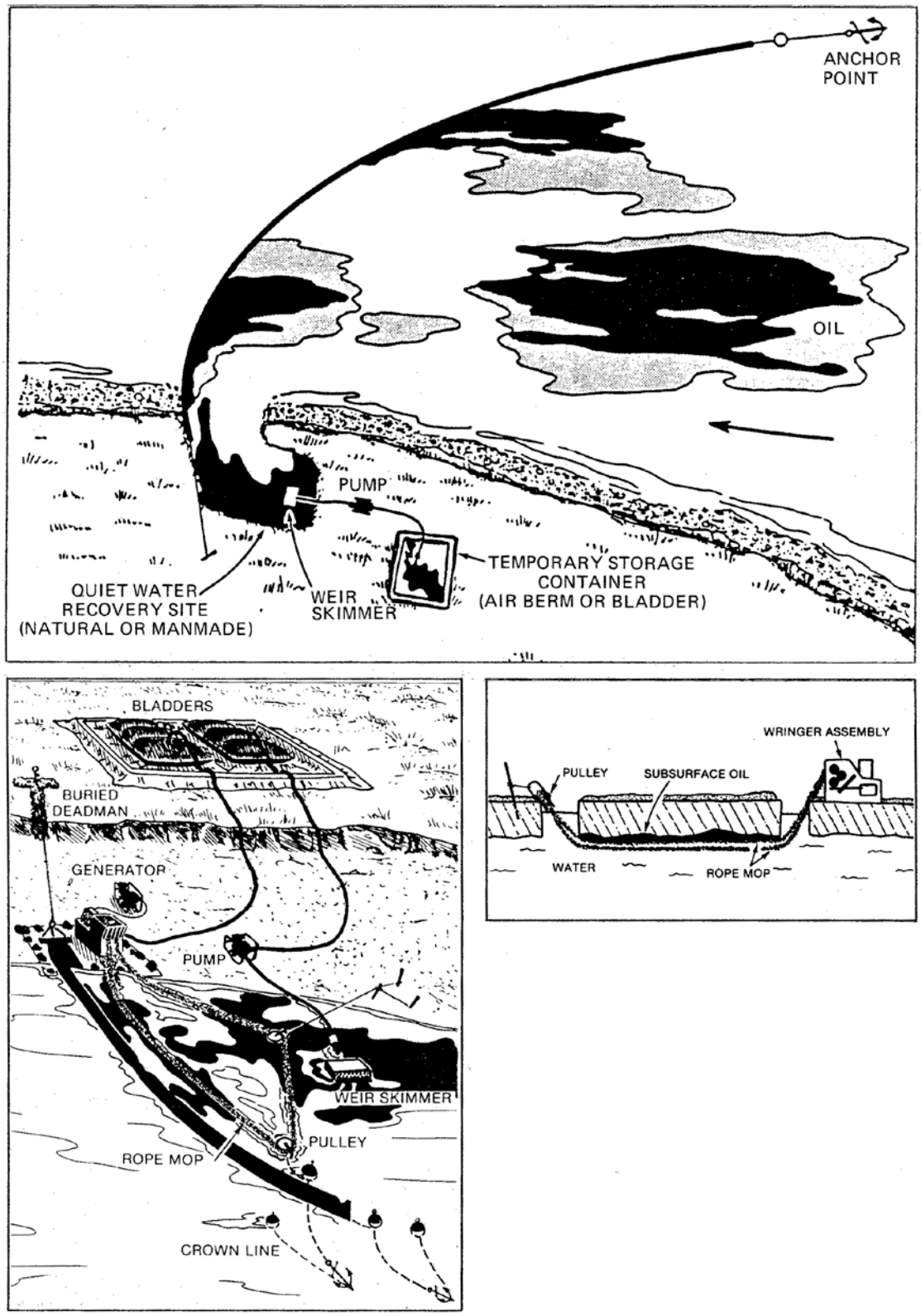


**Figure 2.3-3**
**Use of Skimmers along a Shoreline**



### 2.3.3 Open Water (Lake) Containment Booms

**Use**. Booms deployed in front of open-water slicks or streamers are used to contain floating oil. Allow winds and currents to concentrate the oil at the boom's closed end for recovery.

**Limitations**. Excessive spill size, implementation time, large waves, adverse weather, and availability of recovery equipment.

**General Instructions**. Position the deployment boat along one side of the slick's leading edge. Deploy the boom using an assist boat or attach a drogue to one end. Tow the free end around the slick's leading edge and hold it in place with the assist boat or drogue, as shown in Figure 2.3-4a. Wind and currents will concentrate the oil in the boom's apex where a boat can be positioned to begin skimming operations. Under strong wind and sea conditions, it may be advantageous to deploy upwind and chase the slick downwind in order to reduce the relative forces between the boom and the seas.

**Equipment Required**. Deployment boat(s), drogues, open-water boom, and portable or self-propelled skimmer.

**Maintenance**. Continually reposition the skimmer to the area of heaviest oil concentration. Check the boom periodically for leakage and broken, twisted, or submerged sections. The boom may require repositioning or redeployment if the current or wind direction changes appreciably.

**Cleanup**. After skimming, remove oil sheens using sorbents.

**Variations**. Boom may be deployed to completely or partially encircle the slick as shown in Figures 2.3-4b and 2.3-5. Two boats or two sea anchors can be used to deploy the boom in a catenary configuration as shown in Figure 2.3-4. Tow the boom ends up either side of a slick until all the oil is contained within the boom. Two additional boom configurations are depicted in Figures 2.3-4c and 2.3-6.

**Figure 2.3-4**
**Open Water Containment: a) Catenary Configuration;**
**b) Encirclement Configuration; c) "J" Configuration**

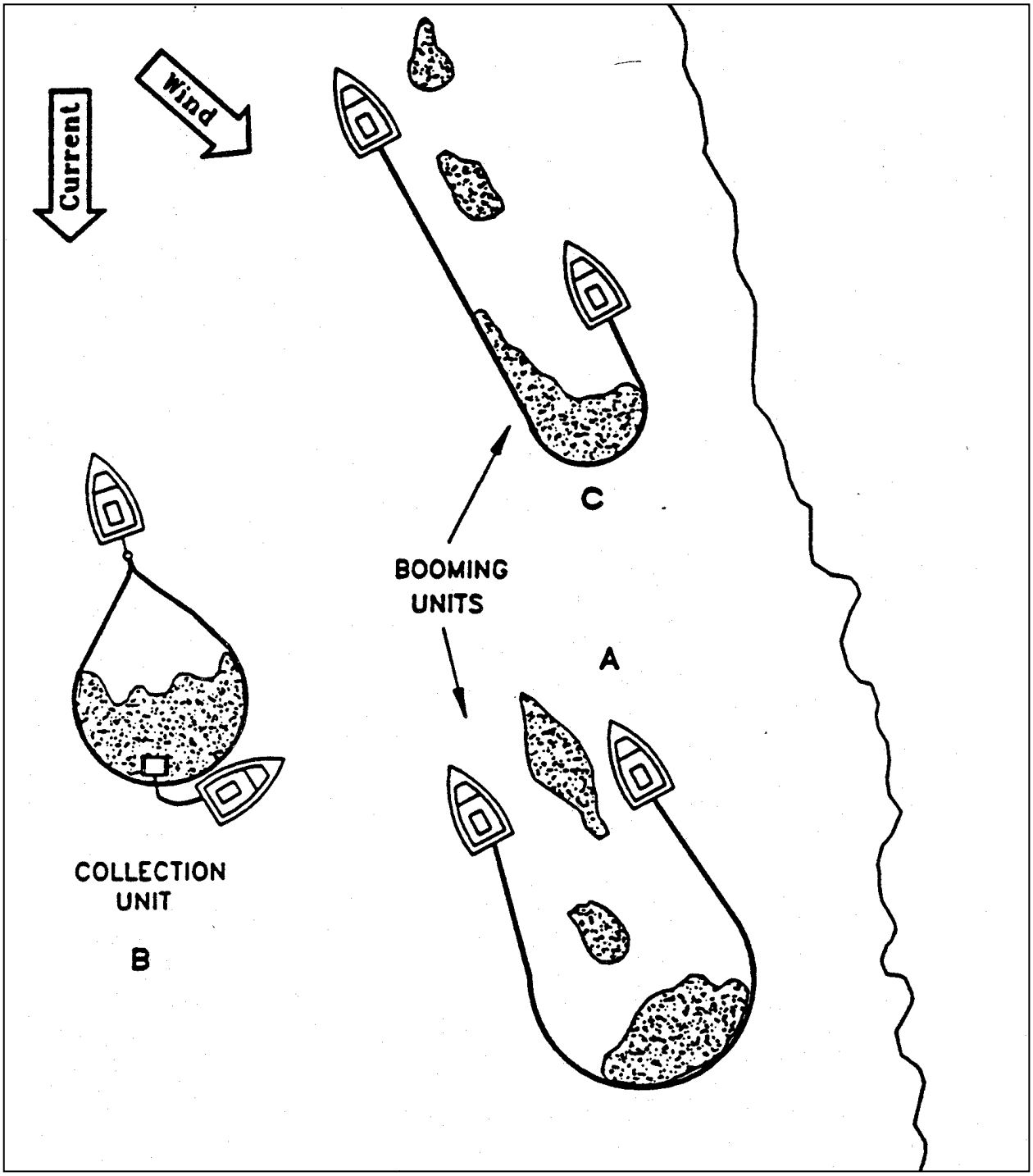


**Figure 2.3-5**
**Open Water Containment: Boom in Encirclement Configuration**

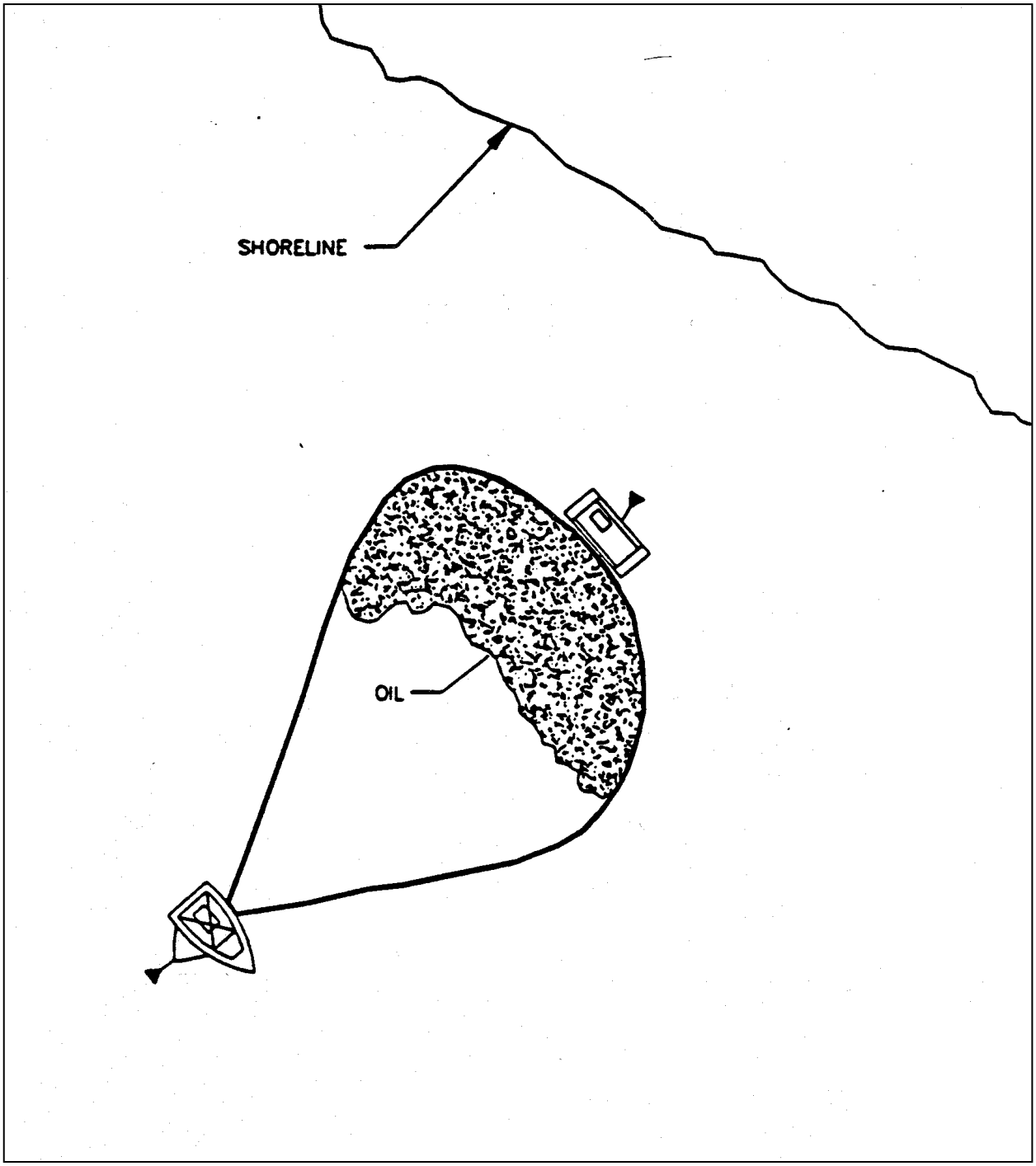
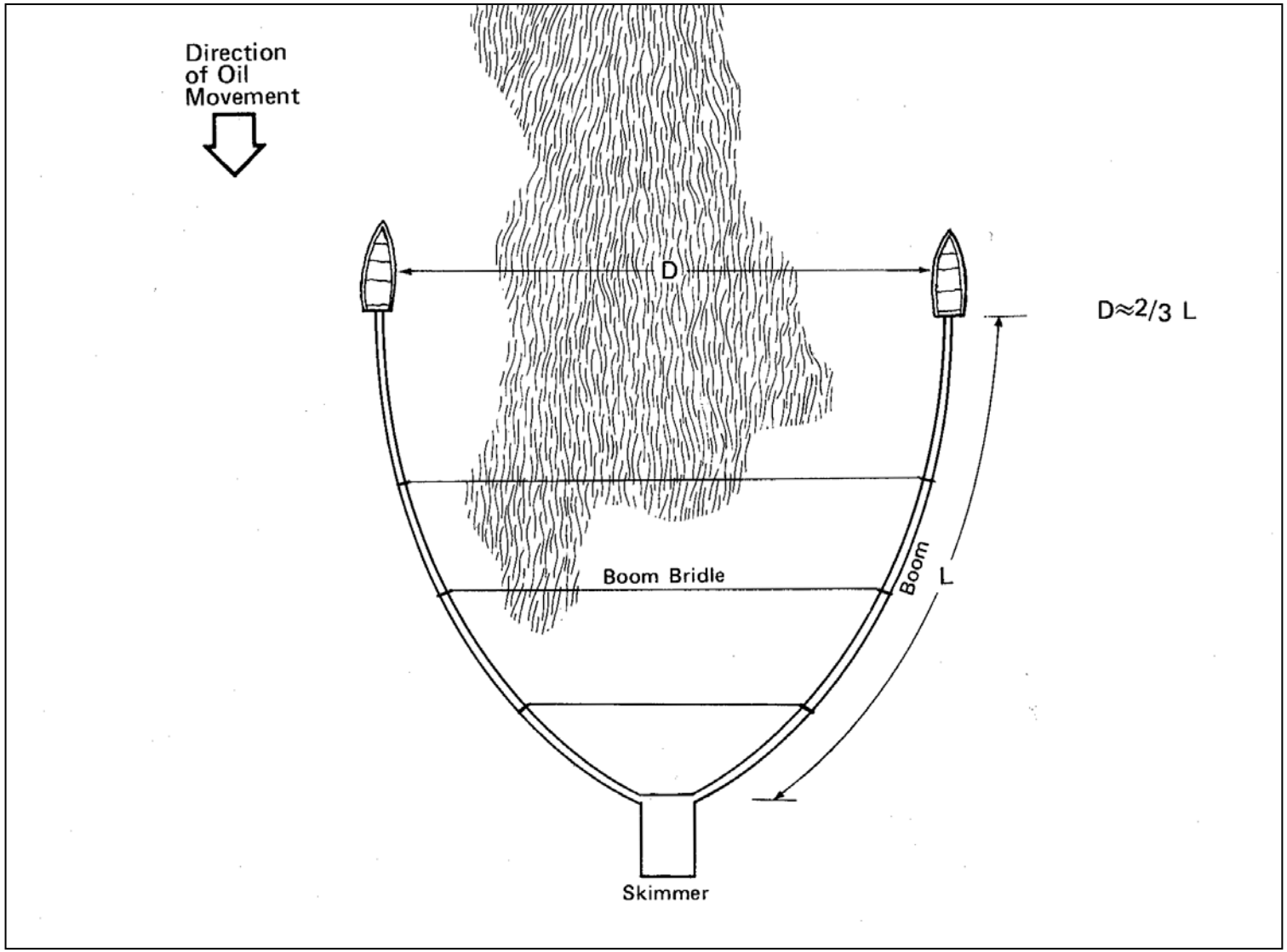


**Figure 2.3-6**
**Open Water Containment: Double Boom Configuration**



## 2.3.4 Diversion Booming

**Use**. Booms are positioned along low-energy shorelines to divert oil away from sensitive shoreline areas to less sensitive onshore or offshore areas for subsequent recovery. Proven to be an effective booming technique in currents greater than 1 knot.

**Limitations**. Accessibility, implementation time, availability of deployment equipment, and heavy wave conditions.

**General Instructions**. Anchor one end of the boom to the shoreline and, using a vessel, position the boom's free end at an angle to the current. If oil is being diverted to the shore, angle the boom's free end towards the oncoming oil, as shown in Figure C-19. Oil diverted towards the shore can be recovered by skimming or pumping. If oil is being diverted away from the shore, angle the free end away from the approaching oil. If the spill is large or continuing, the free end of the boom should also be anchored in place.

As depicted in Figure 2.3-8, two booms can be deployed to divert an approaching slick from a shoreline and into a floating skimmer. Secure one end of each boom to opposite sides of the skimmer and tow one free end along or parallel to the threatened shore. By towing the other free end toward open waters, the booms form a "vee" configuration to trap the encroaching oil while the skimmer recovers the contained oil before it reaches the shore.

The optimum angle of boom deployment is dependent upon the type and length of boom used, the current velocity, and the shape and position of the approaching slick. Generally, the free end of the boom must be angled toward the shoreline as current velocity increases. To avoid boom failure in strong currents, the deployment angle must be smaller than in weak currents. The same relation is true with regard to boom length. The optimum deployment angle decreases as boom length increases unless the boom is anchored at several places along its length. Refer to Figure 2.3-9 for optimum boom deployment angles as a function of current velocity.

**Equipment Required**. Boom deployment boat(s), anchor(s), and hand tools.

**Maintenance**. Check the boom periodically for leakage and broken, twisted, or submerged sections. The deployment angle may require periodic adjustment in the event of significant wind or current changes, oil entrainment beneath the boom, or excessive oil buildup behind the boom. The shoreline anchor point may require occasional repositioning due to water level fluctuations.

**Cleanup**. Recover residual oil sheens using sorbents. See Section 2.6 for specific shoreline cleanup techniques.

**Variations**. For very low-energy shorelines, a secondary boom can be anchored parallel to the shore just beyond the surf line with the downcurrent end connected to the diversion boom. As the oil is diverted towards the shore, the secondary boom prevents contamination of the shoreline.

**Figure 2.3-7**
**Diversion Booming Techniques for Protection of Sensitive Areas**

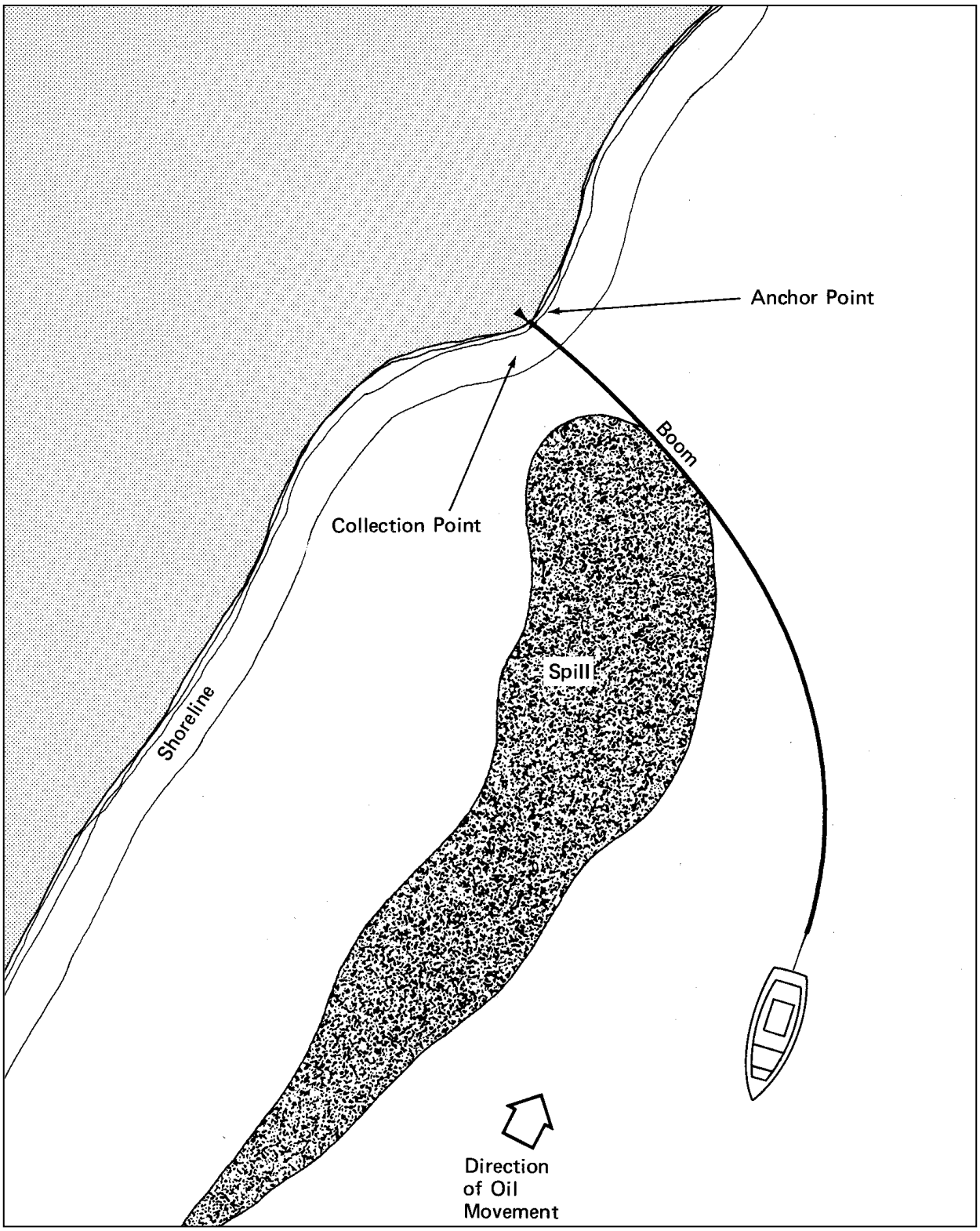


**Figure 2.3-8**
**Shoreline Containment: Diversion Booming to Skimmer**

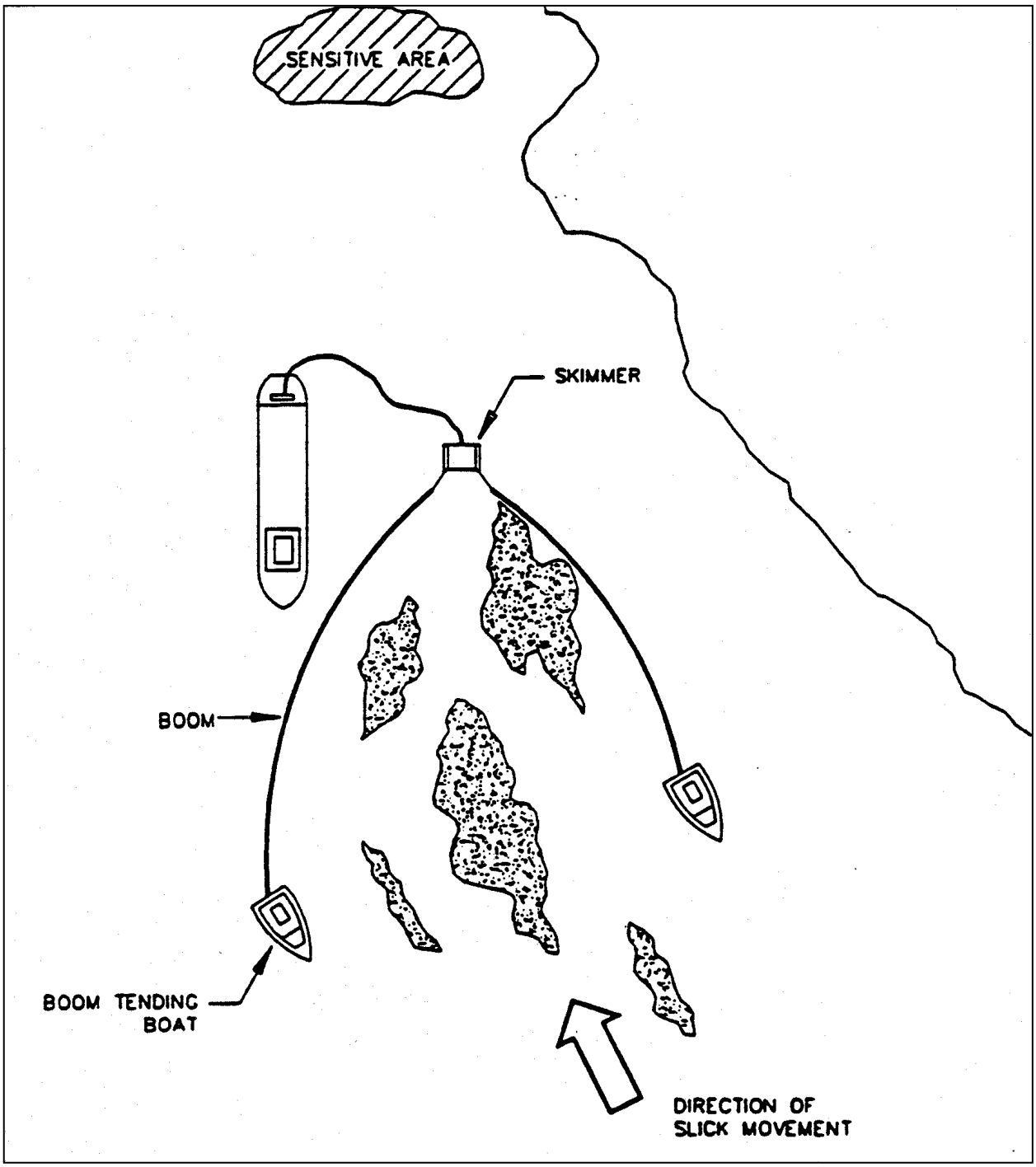
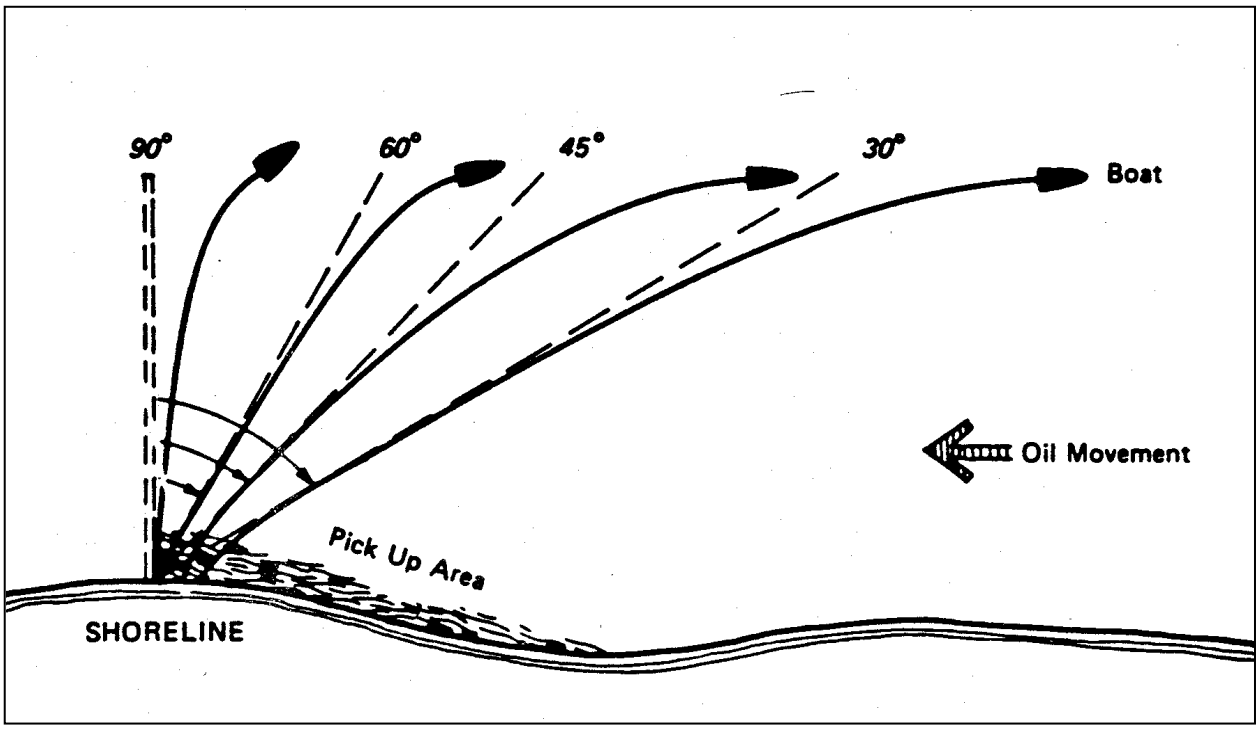


**Figure 2.3-9**
**Shoreline Containment: Boom Deployment Angles**




| Current (kts.) | Current (fps.) | Boom (angle) |
|---|---|---|
| 1.5 | 2.5 | 70 |
| 1.6 | 2.7 | 60 |
| 1.7 | 2.8 | 55 |
| 1.8 | 3.0 | 50 |
| 2.0 | 3.4 | 45 |
| 2.2 | 3.7 | 40 |
| 2.5 | 4.2 | 35 |
| 2.8 | 4.8 | 30 |

**Difficulty in deployment will increase and effectiveness will decrease as a function of water velocity.**

## 2.3.5 Exclusion Booming

**Use**. Booms are used to exclude oil from sensitive shorelines by deploying them along the area's periphery.

**Limitations**. Accessibility, implementation time, adequate water depth for effective boom placement, wave action, and current velocities.

**General Instructions**. Place booms across the area to be protected and anchor both ends to the shore. For inlets or harbor entrances, booms should be placed inside the openings where current velocities and wave action are lowest. To allow vessel passage through harbor waters, one boom end may be attached to a small, manned boat. Booms may also be deployed in a cascading configuration, as described in Section 2.3.6, which provides vessel passage and the exclusion of oil. To maintain boom integrity, anchors should be placed at 100-foot intervals if substantial boom lengths are required. Wind and wave conditions may necessitate more frequent intervals or heavier anchors. Several exclusion techniques are shown in Figures 2.3-10 through 2.3-12.

**Equipment Required**. Anchors, boom deployment equipment (boats, tow lines, etc.), and hand tools.

**Maintenance**. Check boom periodically for integrity, leakage, or twisted, broken or submerged sections. In tidal waters or areas with fluctuating water levels, reposition the boom and/or its anchor points as water levels change.

**Cleanup**. Recover contained oil by skimming or pumping. Adjacent shorelines can be cleaned using techniques described in Section Appendix D.

**Variations**. Double or triple booming may be employed in areas with high currents. Position a primary boom in the area of strongest currents and deploy secondary or tertiary booms several hundred yards behind the first as a backup safety measure.

**Figure 2.3-10**
**Shoreline Containment: Exclusion Booming**

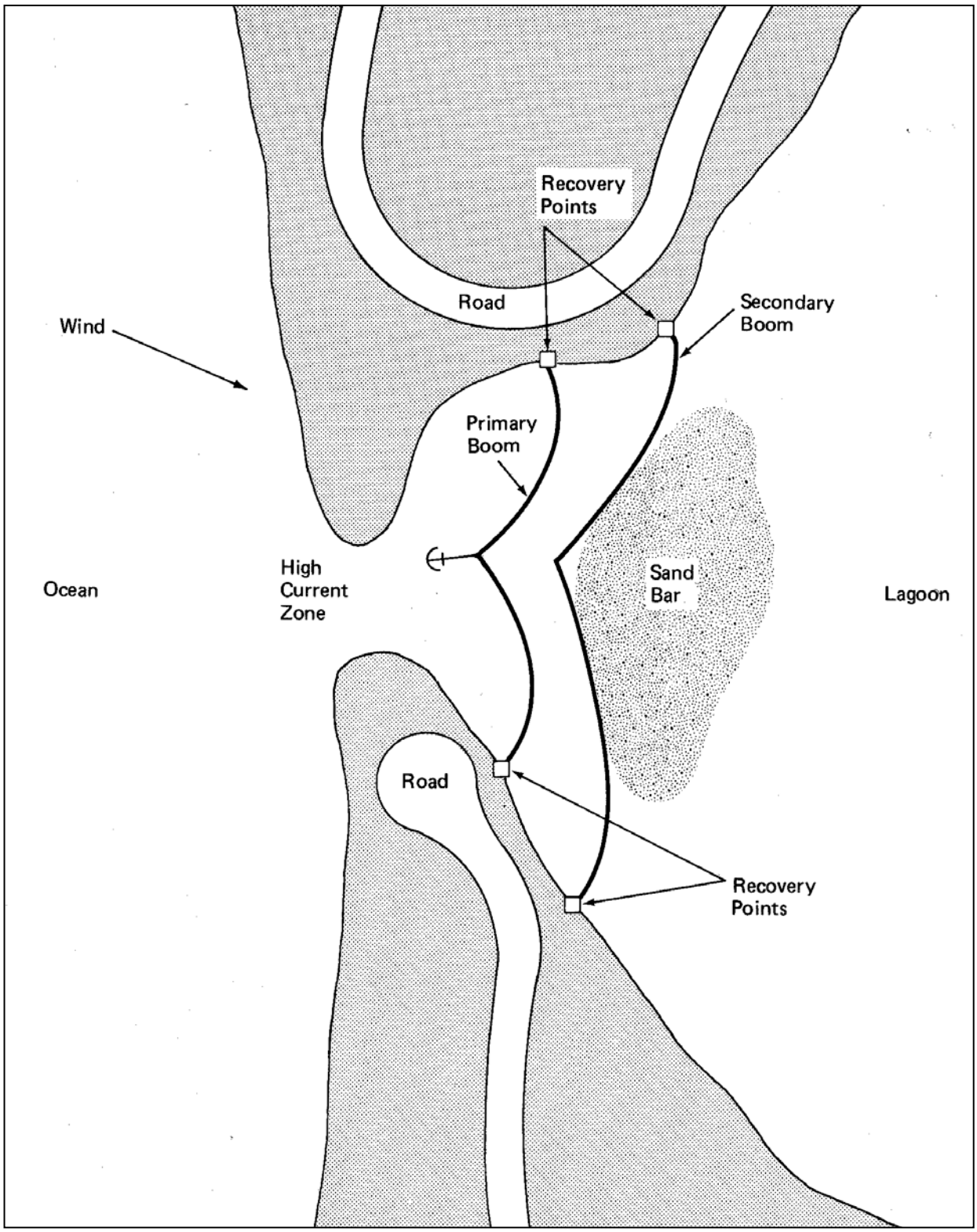


**Figure 2.3-11**
**Shoreline Containment: Exclusion Booming at Inlet With High Channel Currents**

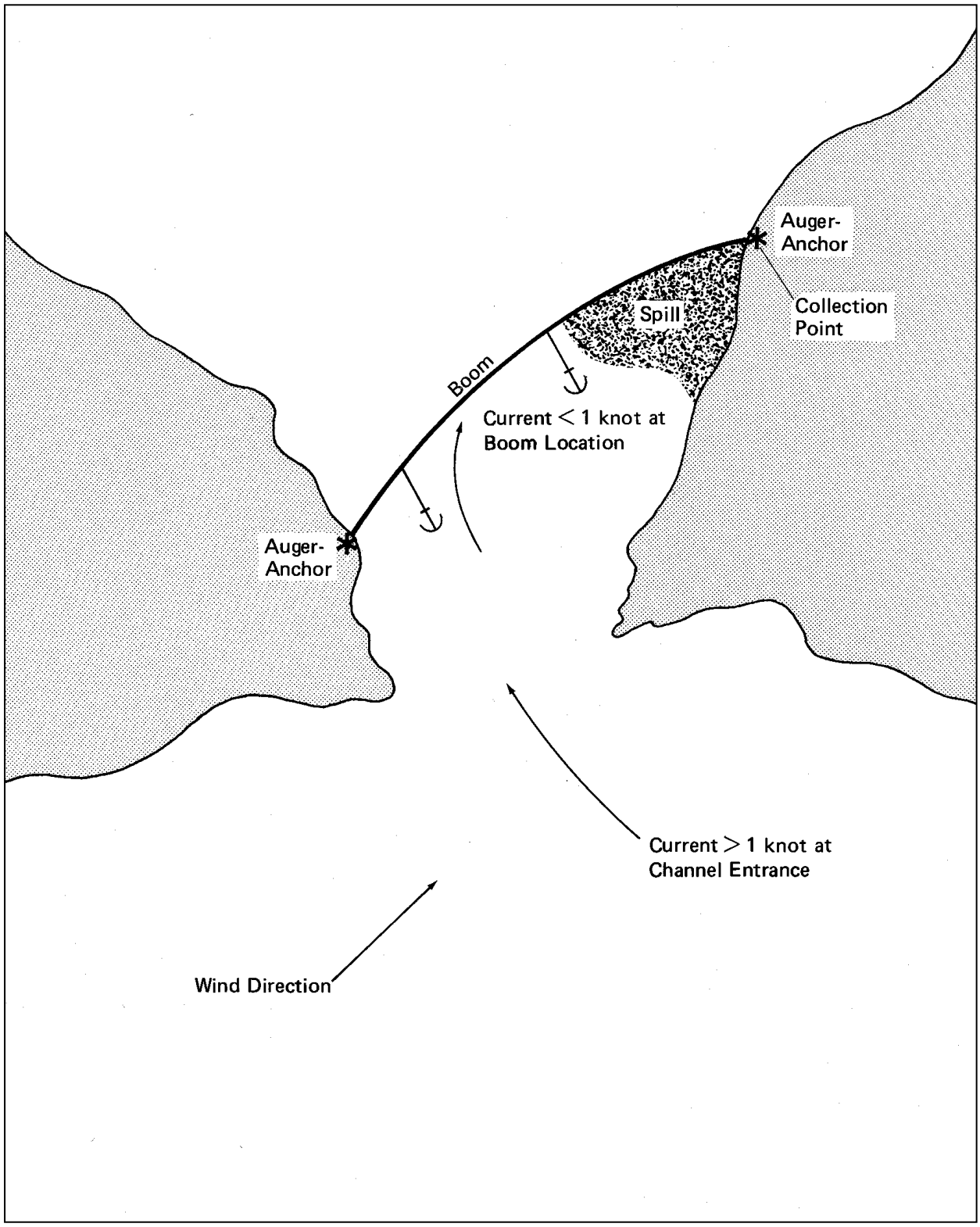
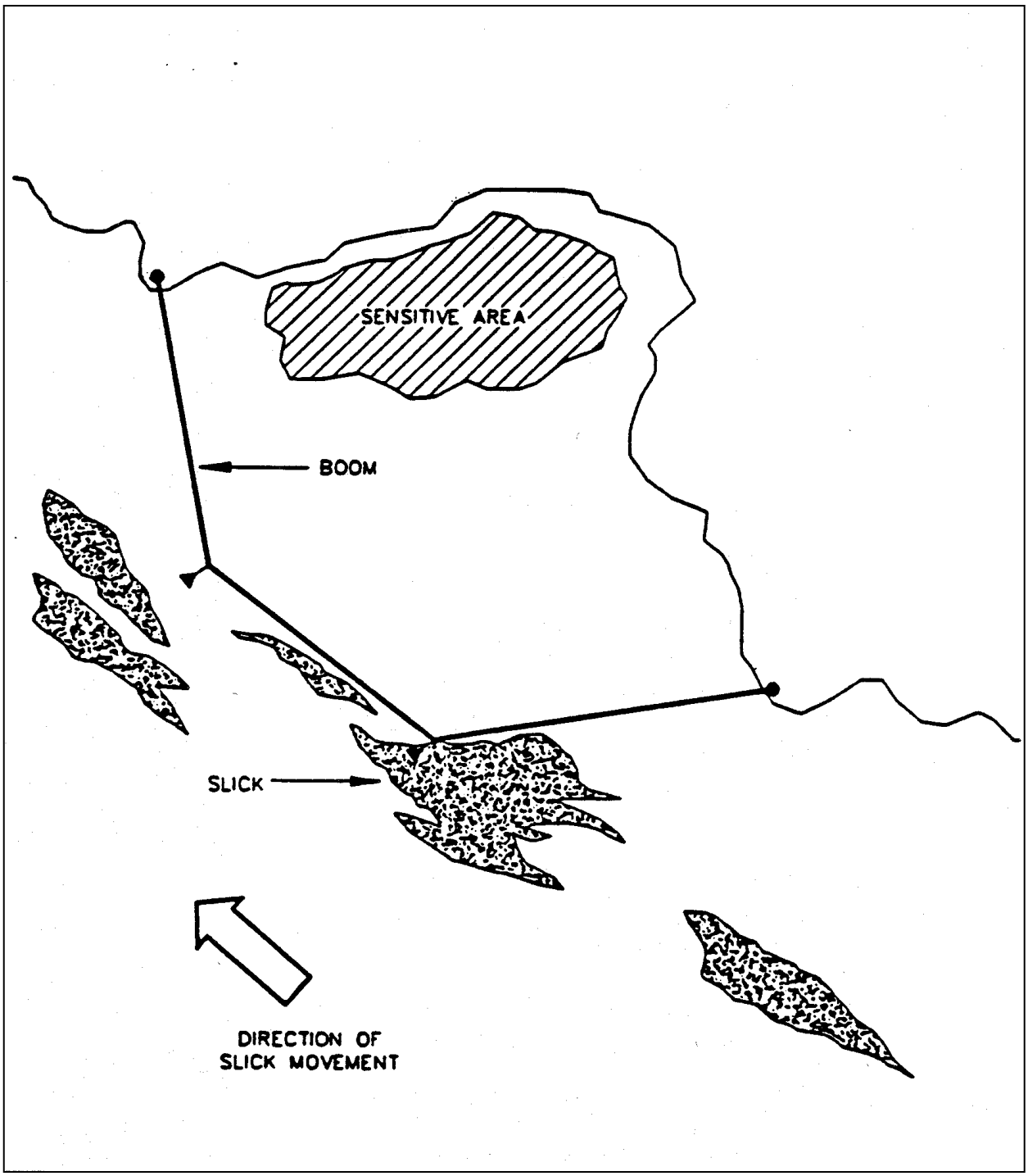


**Figure 2.3-12**
**Shoreline Containment: Exclusion Booming**



## 2.3.6 Cascading Booms

**Use**. A series of booms deployed in a cascading formation are used on rivers or coastal areas where currents are too strong for standard containment booming. Cascading booms direct oil to the shore for recovery.

**Limitations**. Accessibility, implementation time, currents over 2.5 knots, and soft stream bottoms.

**General Instructions**. Tow the lead boom to the opposite shore or to some point mid-stream and anchor it at an angle to the current. Deploy a second boom angled toward the shoreline and anchor the free end 25 to 30 feet downstream from the first so that it overlaps the trailing end of the lead boom. Deploy successive booms in the same manner until the shoreline is reached (Figures 2.3-13 and 2.3-14). Diverted oil is recovered by skimming, pumping, or using vacuum trucks. A containment pit can be dug into the river bank or shoreline to assist oil recovery. The optimum boom deployment angle decreases as current velocity and boom length increase, unless several anchor points are set along the length of the boom.

**Equipment Required**. Deployment boat, anchors, backhoe (to dig containment pit), and hand tools.

**Maintenance**. Periodically check the boom for leakage and adjust the deployment angle, if necessary. Also, check the boom for damaged, twisted, or submerged sections. Check anchors for security.

**Cleanup**. Remove booms and recover remaining sheens with sorbents. Clean shorelines using techniques described in Section 2.6.

**Variations**. If booms are unavailable or if the water is too shallow, berms may be constructed using streambed or near-site materials arranged in a cascading configuration (see Figure 2.3-15). Cascade berming can also make use of existing streambed bars.

**Figure 2.3-13**
**Placement Configuration of 3 Lengths of Boom (Cascading Deflection Booms)**

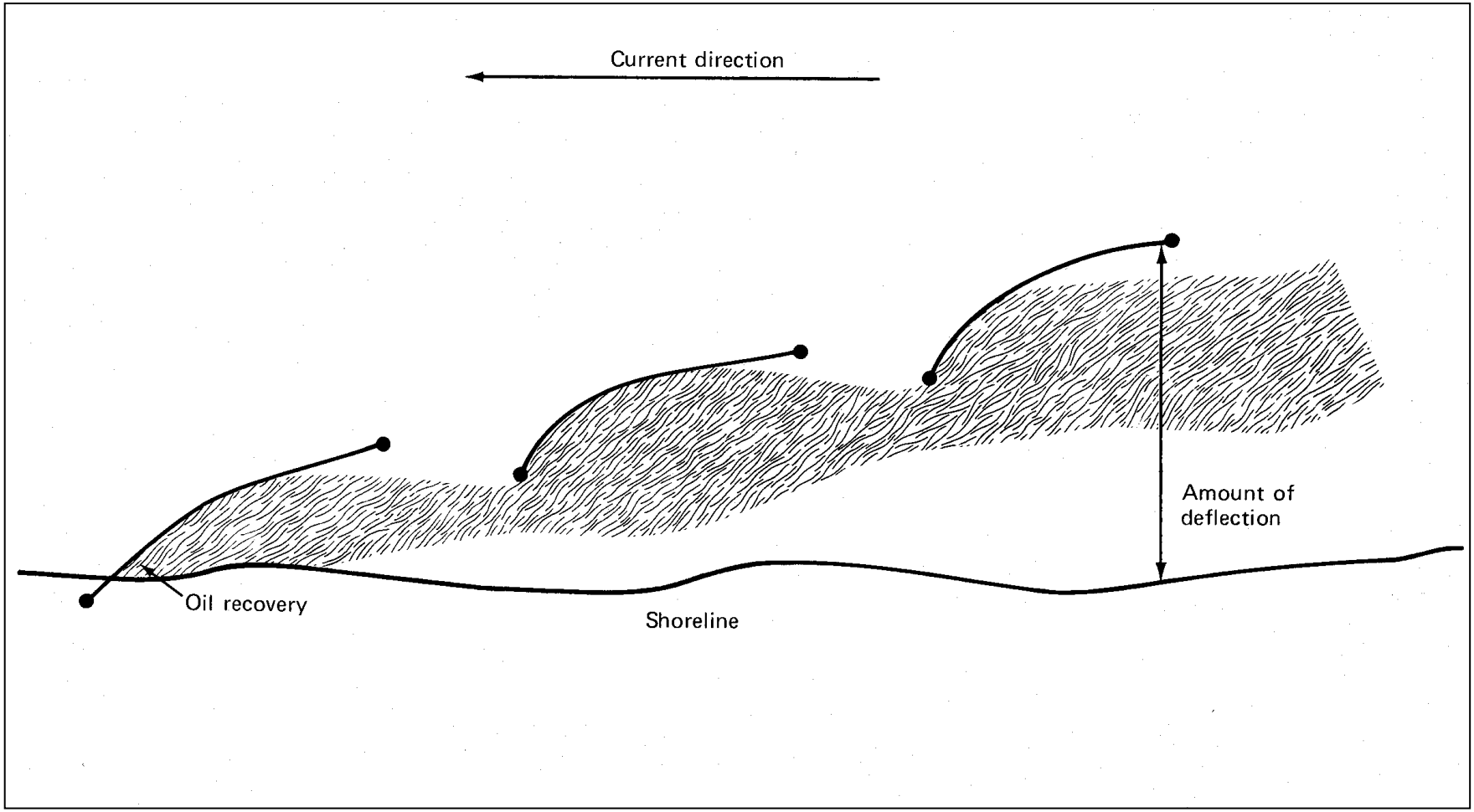


**Figure 2.3-14**
**Cascading Diversion Booms**

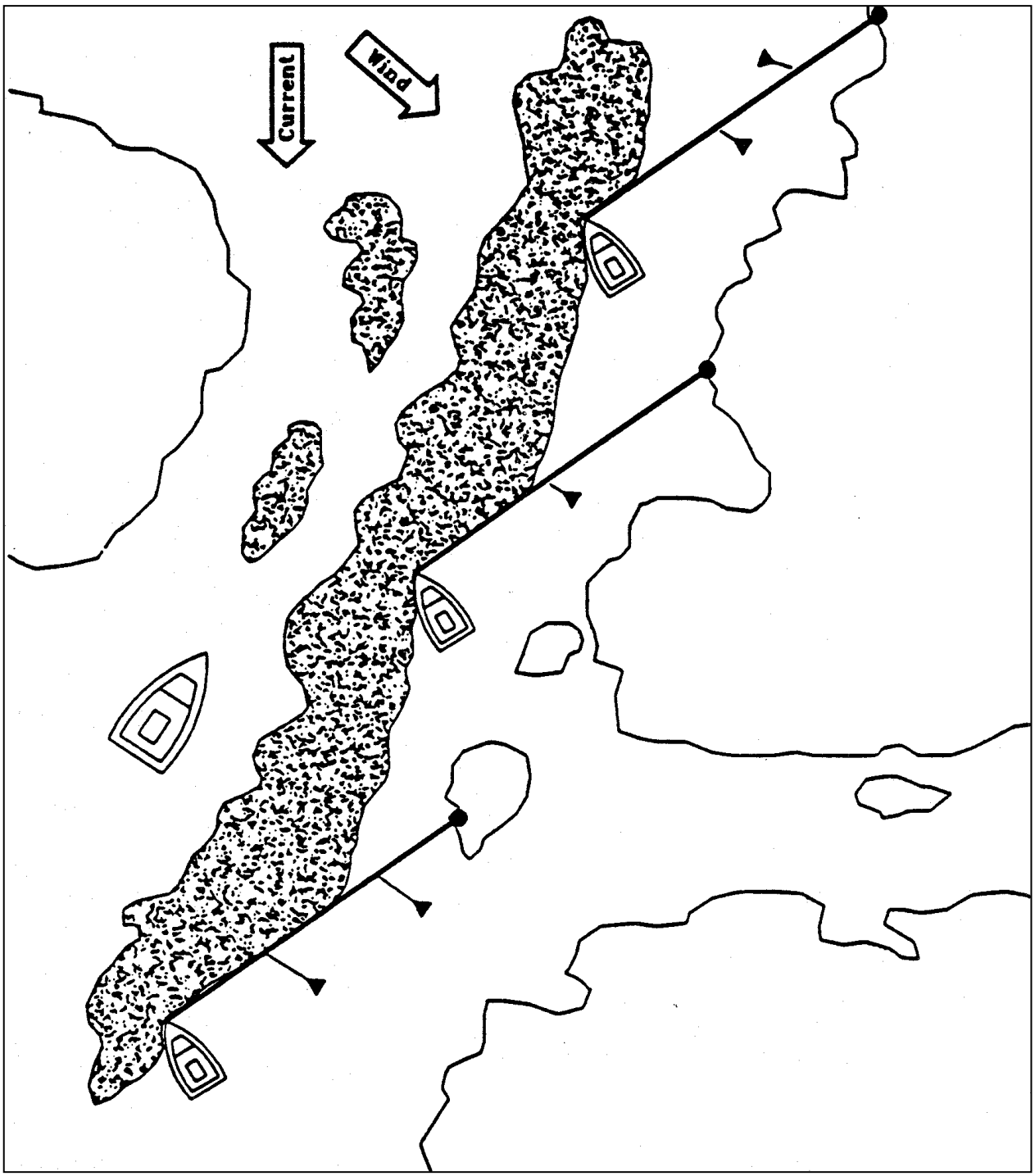
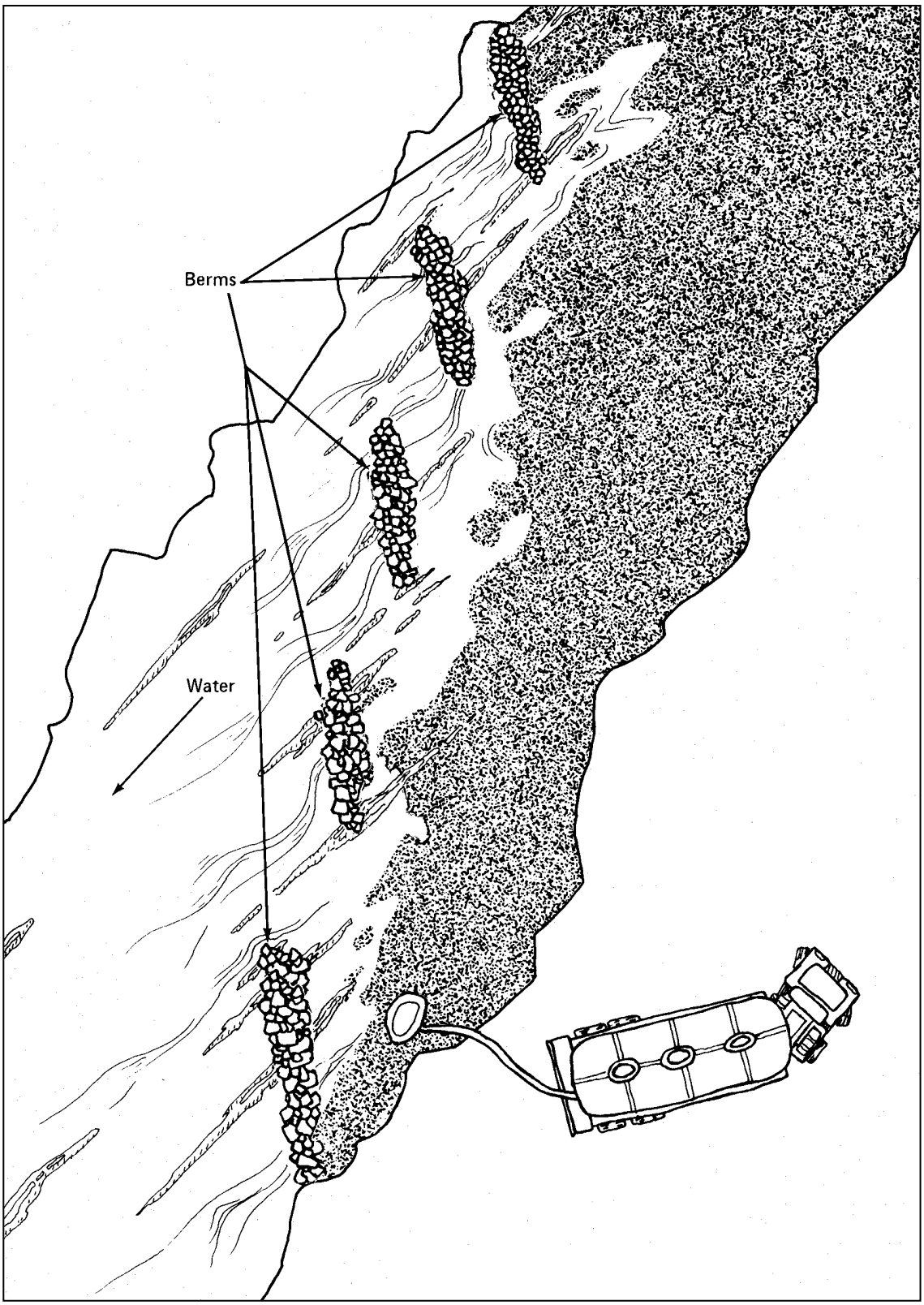


**Figure 2.3-15**
**Cascading Berming**



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## 2.4 CLEANUP GUIDES

This Section discusses the various techniques available for mechanical recovery, or cleanup, of spilled oil. The containment and protection techniques addressed in Sections 2.2 and 2.3 typically will be used in combination with mechanical recovery techniques. The strategies and methods for mechanical recovery are discussed in general, describing their objectives, limitations and general instructions. This discussion is intended to be used to assist in the decision-making process for selecting the appropriate method.

### Cleanup Method Selection

Historically a number of cleanup techniques have been developed to recover spilled oil. Open water recovery techniques depend primarily on the physical characteristics of the oil and logistical considerations, such as availability of equipment and weather. Selection of the proper technique to clean an oiled shoreline or terrestrial area depends on the following factors:

1. Type of substrate
2. Amount of spilled oil
3. Depth of oil penetration or burial in sediments
4. Type of oil
5. Type of oiling (i.e., tar balls, pooled oil, viscous-coating, etc.)
6. Suitability of surface conditions for equipment operation on shoreline
7. Environmental sensitivity of oiled shoreline.

A series of decision guides has been prepared that will allow the user to evaluate these factors or a given shoreline and to select the preferred cleanup technique. Guide 2-5 presents a key to decision guides 2.6 through 2-10.

**Decision Guide**. The procedure for using the decision guide is as follows:

1. Use Guide 2-5 (Key to Decision Guides) to determine which of the other decision guides is applicable for the cleanup of each area in question. For shorelines, enter with the type of substrate that is oiled and follow the guide, answering the questions where appropriate.

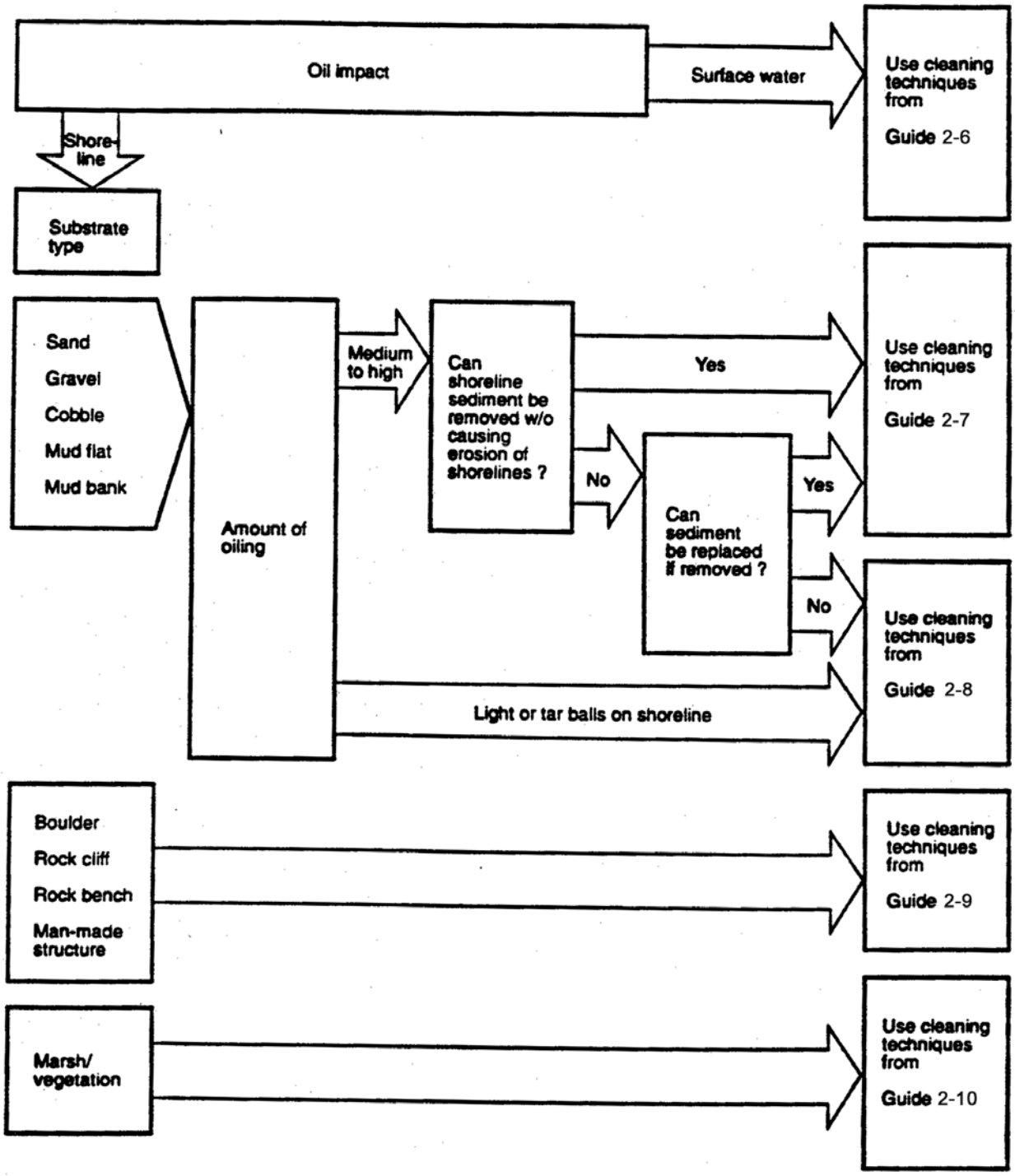
2. Enter the decision guide selected (Guide 2-6, 2-7, 2-8, 2-9 or 2-10) and answer the questions for each surface water or shoreline section that requires cleanup. The guide will lead the user to one or more cleanup techniques applicable to this situation, with the most preferable technique listed first. If the first technique cannot be used because of the lack of equipment or access to shoreline, then the next technique should be chosen.

**Shoreline Cleanup Factors**. Most of the questions asked in the decision guides can be answered after simple field observations have been made for each shoreline section requiring cleaning. At least two questions, however, may require special local expertise:

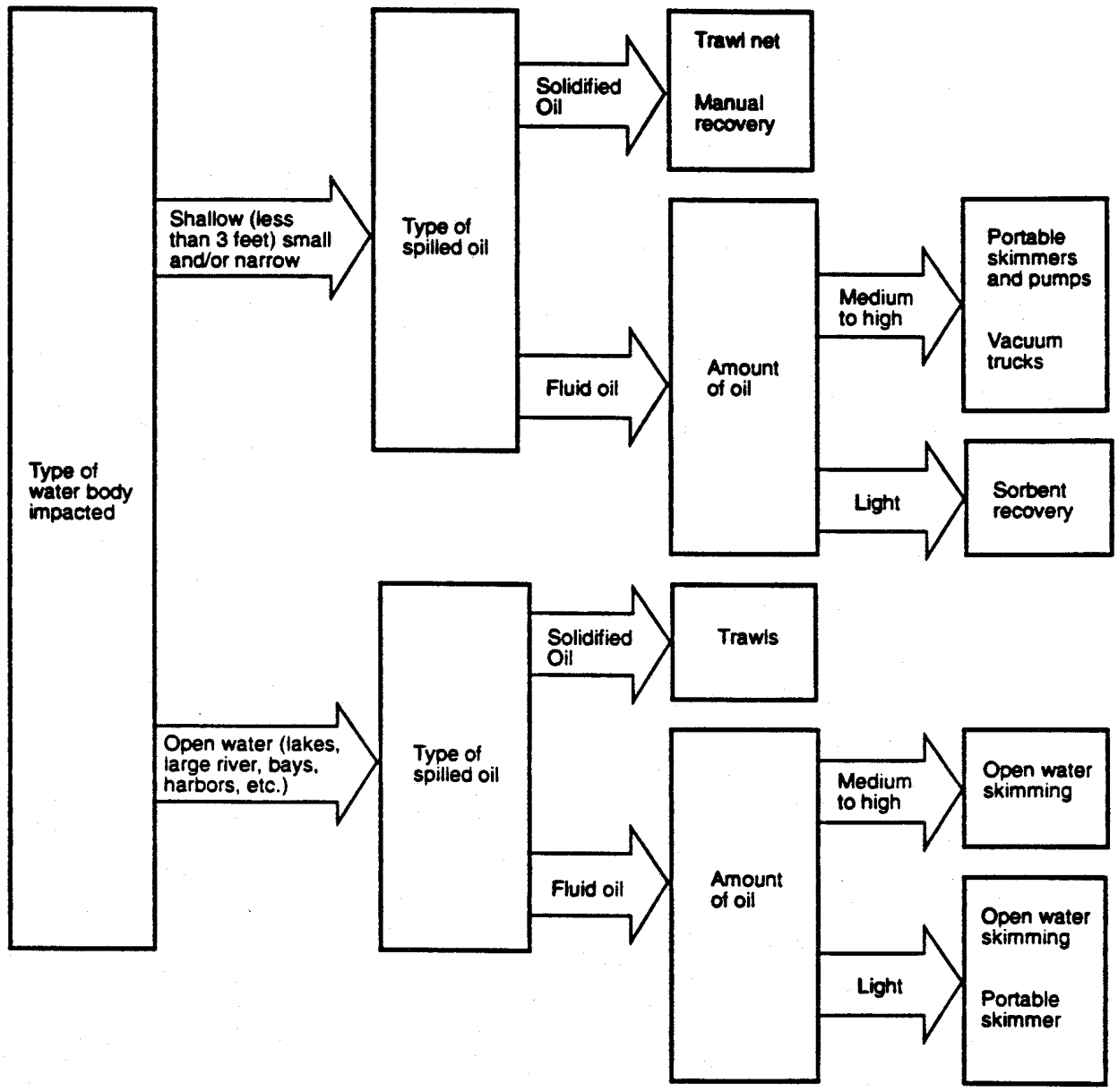
**Guide 2-5** - Can shoreline sediment be removed without causing erosion of shorelines? The Corps of Engineers, the U.S. Geological Survey, and/or a local shoreline processes geologist should be consulted to determine if sediment removed from shorelines may cause increased erosion of the shoreline.

**Guide 2-8** - Can oil remain on shoreline or in nearshore areas without causing environmental problems? Tesoro will work with the FOSC and appropriate agencies (generally in consultation with local and regional biologists/ecologists) to determine the impacts of leaving oil on or near a shoreline.

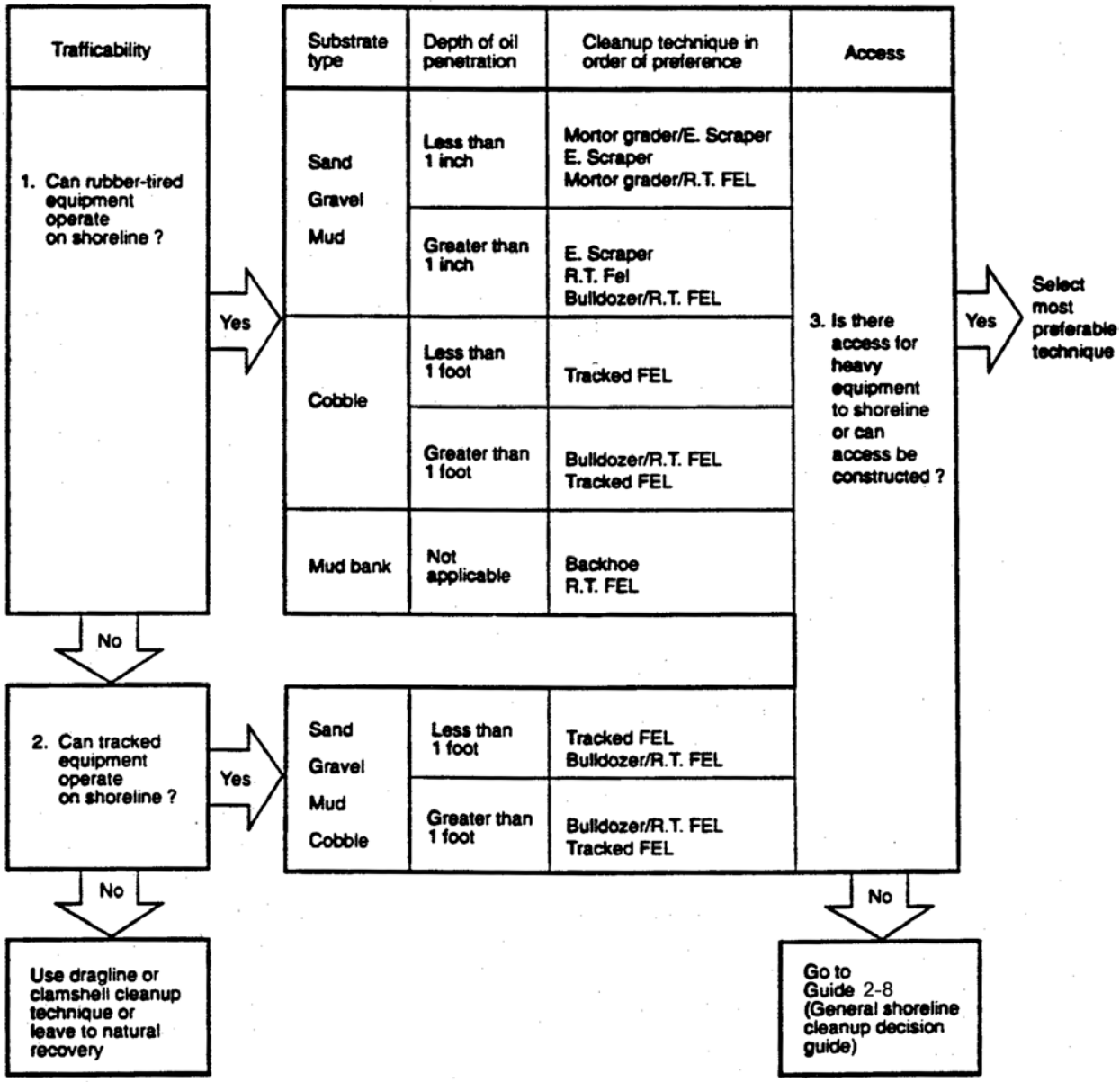
# Guide 2-5
# Key to Decision Guides



# Guide 2-6
# Surface Water Cleanup Decision Guide

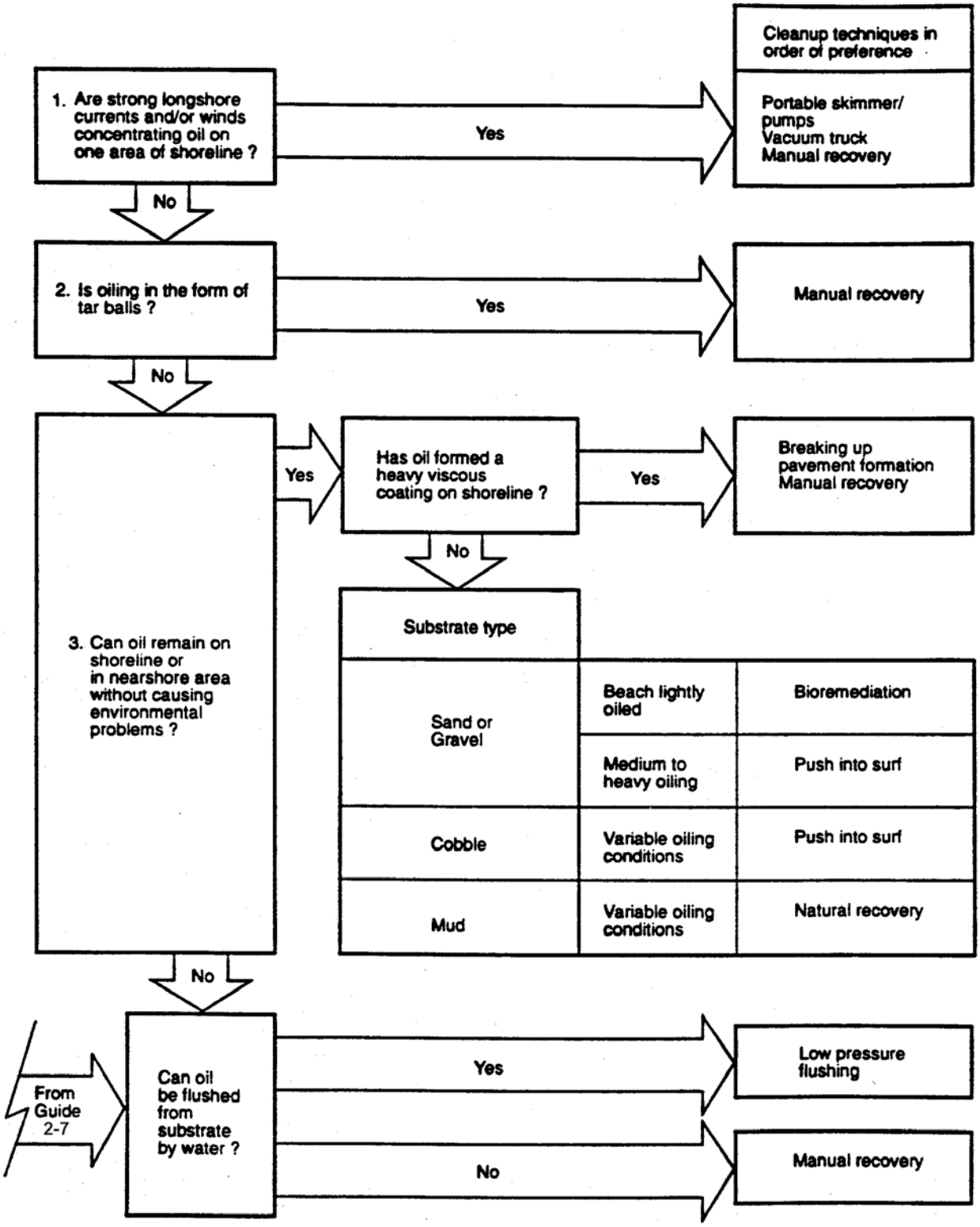


# Guide 2-7
# Mechanized Shoreline Cleanup Decision Guide

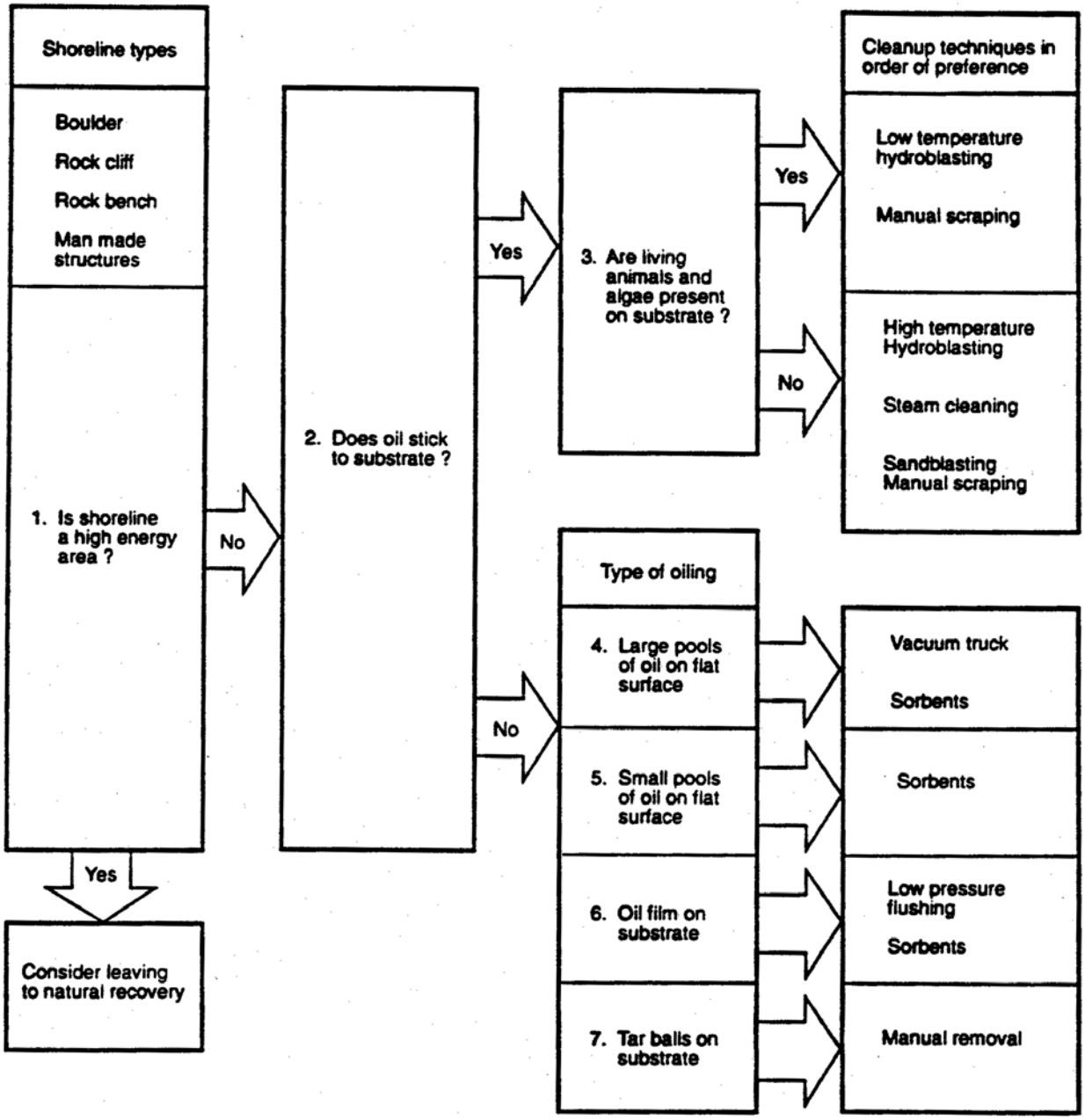



R.T. = Rubber Tired
FEL = Front End Loader

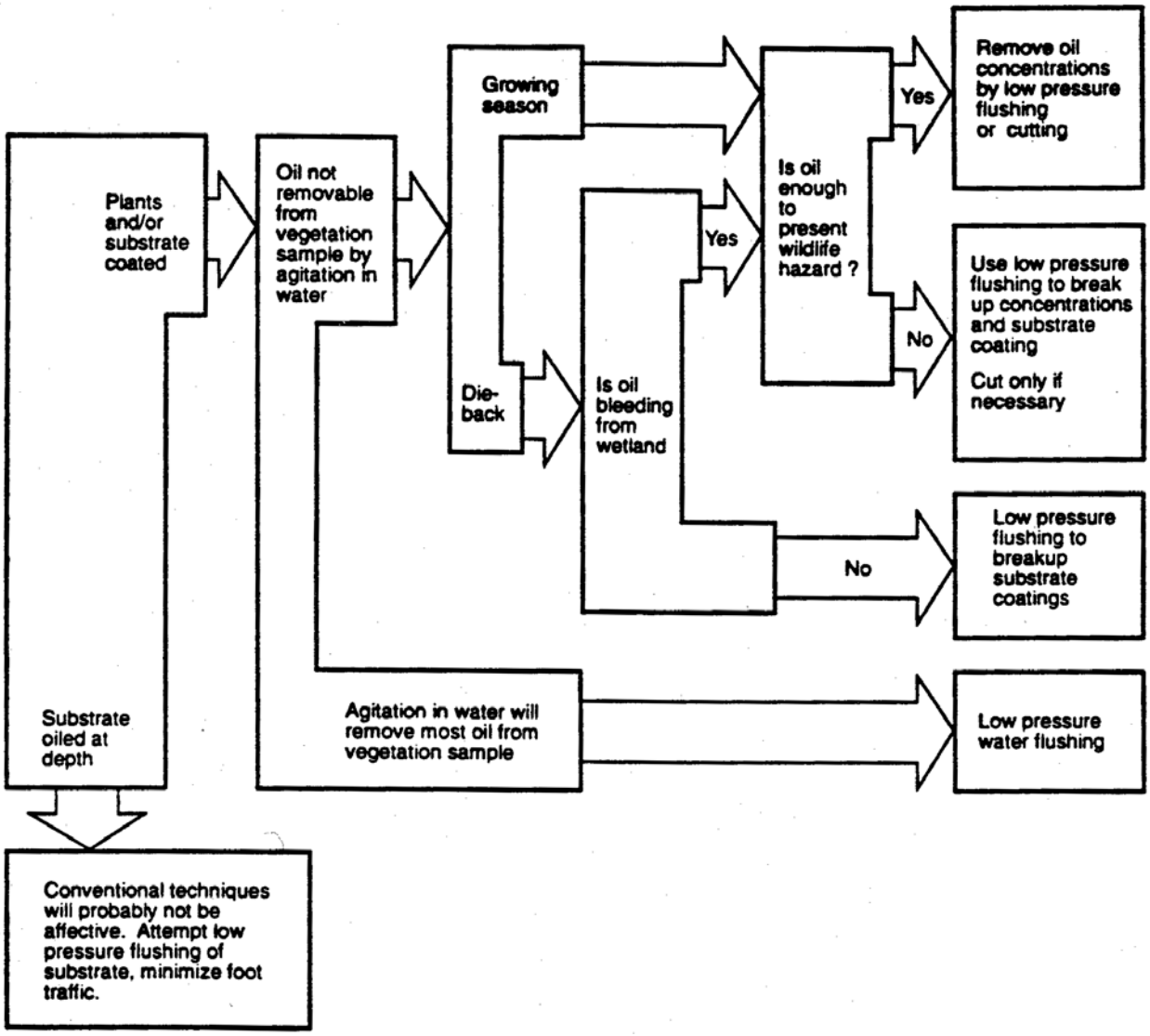
# Guide 2-8
# General Shoreline Cleanup Decision Guide



# Guide 2-9
# Nonsediment Substrate Cleanup Decision Guide



# Guide 2-10
# Wetland Cleanup Decision Guide



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## 2.5 ON WATER RECOVERY

### 2.5.1 Vacuum Trucks

**Objectives**. To recover oil from land and water surfaces by using suction generated by the vacuum truck to draw oil from concentrated areas into the truck for transport to reprocessing or disposal facilities.

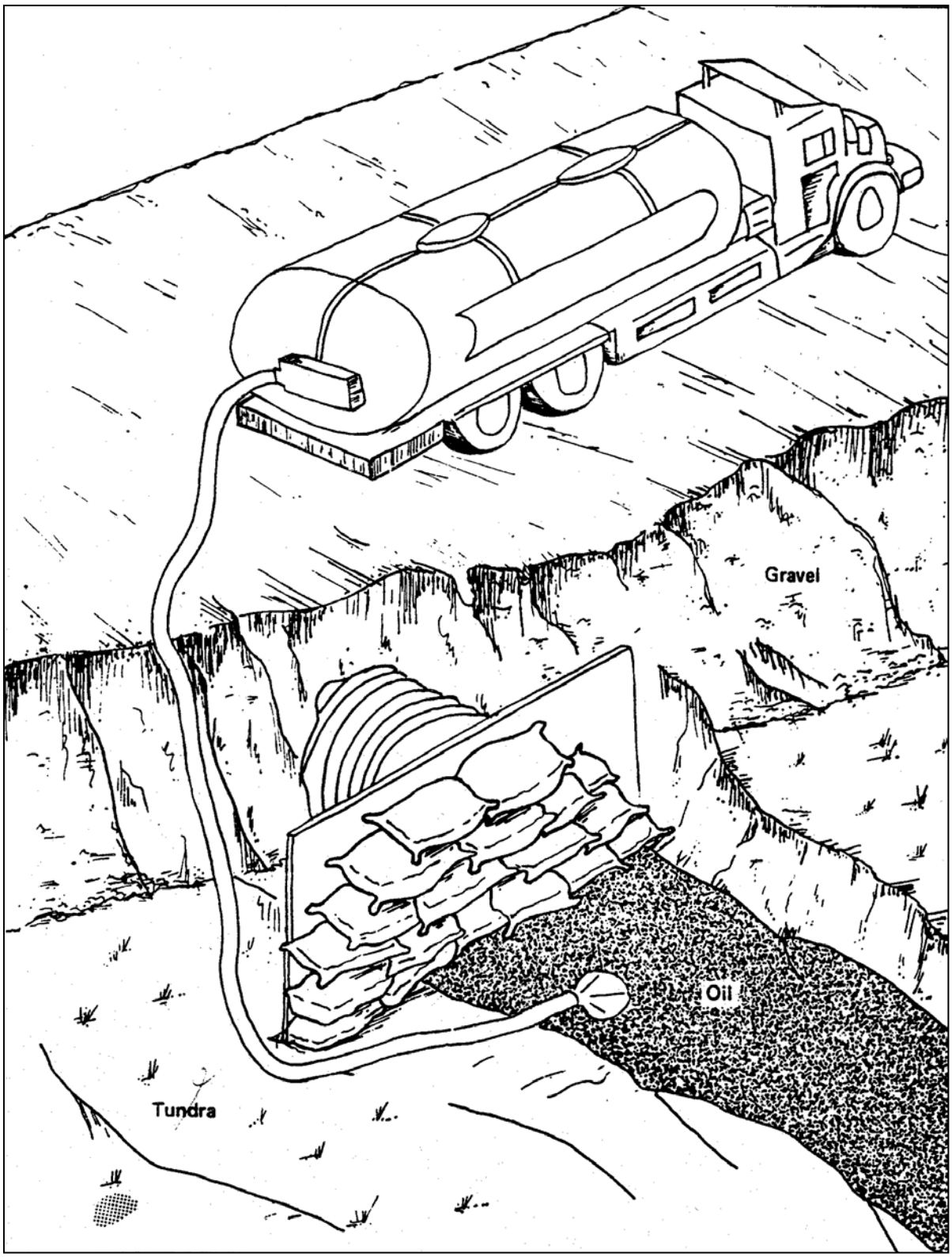
**Limitations**. Access to spill site, high viscosity oils, very shallow oil concentration, and heavy debris.

**General Instructions**. Position truck adjacent to area of heaviest oil concentration such as behind booms, berms, trenches, sumps, etc. Suction hose nozzle is placed in the oil and maneuvered manually until recovery becomes inefficient. Light sheens should be recovered with sorbents. Screens should be fitted over nozzle to prevent ingestion of sediments or debris. When recovering oil on water, a duck bill or Manta Ray® type skimmer head should be attached to the suction nozzle. This technique is illustrated in Figure 2.5-1.

**Logistics**. The primary logistical requirements for the vacuum truck techniques are given in Table 2.5-1.

**Variations**. For contained spills on open water and in the absence of skimmers, a vacuum truck may be placed on a work boat or barge and brought to the containment site for oil recovery using the above method. Vacuum trucks may be left onsite with recovered oil pumped periodically to tank trucks (can improve turn-around time in some cases, and a vacuum truck acts as a primary oil-water separator).

**Figure 2.5-1**
**Vacuum Truck Oil Recovery**



## Table 2.5-1
## Logistical Requirements for Use of Vacuum Truck

| Equipment | Terrestrial/Shoreline | Surface Water |
|---|---|---|
| Vacuum truck w/3" suction hose | Typical Suction Rate for pooled oil, 100 gpm (75% oil); fill time for 110-barrel truck, ¾ hour. | Typical Suction Rate for oil on water, 50 gpm (5% oil), fill time for 110-barrel truck, 1-½ hours. |
| Number of vacuum trucks required | Dependent of quantity of oil and number of pools present | Dependent on quantity of oil, number of recovery sites, and oil/water ratio. |

**Personnel** - 1 person per suction hose and 1 to 2 persons for manual skimming and concentrating of oil, and 1 supervisor.

**Support**

- Vacuum truck, 6 to 140 barrel (42 gallons/barrel)
    - 6" suction hose, 700 to 800-900 gpm max.[a]
    - 4" suction hose, 500 to 600 gpm max.[a]
    - 3" suction hose, 300 to 400 gpm max.[a]
- Devices for concentrating oil on water
- Booms, skimming boards, low-pressure water hoses

**Access requirements** - heavy equipment, barge, or landing craft

[a]Intake completely submerged, drawing water with little or no suction lift.

## 2.5.2 Portable Skimmers/Pumps

**Objectives**. To recover small to moderate concentrations of oil from terrestrial or aquatic areas, where larger equipment cannot be brought in.

**Limitations**. Accessibility, high viscosity oils, sheens, adequate means of storage or disposal, and adverse environmental conditions (excessive wave heights or currents).

**General Instructions**. Position the skimmer or pump suction hose in the area of heaviest oil concentration behind booms, berms, trenches, etc., or where water currents will drive the oil to the skimmer or hose intake. Continually reposition the intake into area of thickest oil concentration. Duck bill type skimmer heads should be fitted to suction hose for aquatic spills, or screens for terrestrial spills. Pump recovered oil to a temporary storage facility such as a tank truck, 55-gallon drums, pillow tanks, or lined pit. This technique is illustrated in Figure 2.5-2.

When using portable skimmers in shallow water, a hole may have to be excavated in the bottom of the shallow waterway if the skimmer draft is greater than the water depth. Oil can now be herded or forced to the skimmer location by low pressure water flushing or by deploying a boom around a floating slick and pulling it to the floating skimmer.

**Logistics**. The primary logistical requirements for using portable skimmers or pumps are given in Table 2.5-2.

**Variations**. Portable skimmers can also be deployed from boats to recover open water spills contained by booms. Skimmer is operated as described previously and may be used with a floating bladder tank for oil storage as illustrated in Figure 2.5-3. Portable endless rope skimmers have particular application in shallow water areas such as wetlands or creeks. A typical configuration is shown in Figure 2.5-4.

**Figure 2.5-2**
**Oil Recovery Using Portable Pump, Skimmer Head, and Tank Truck**

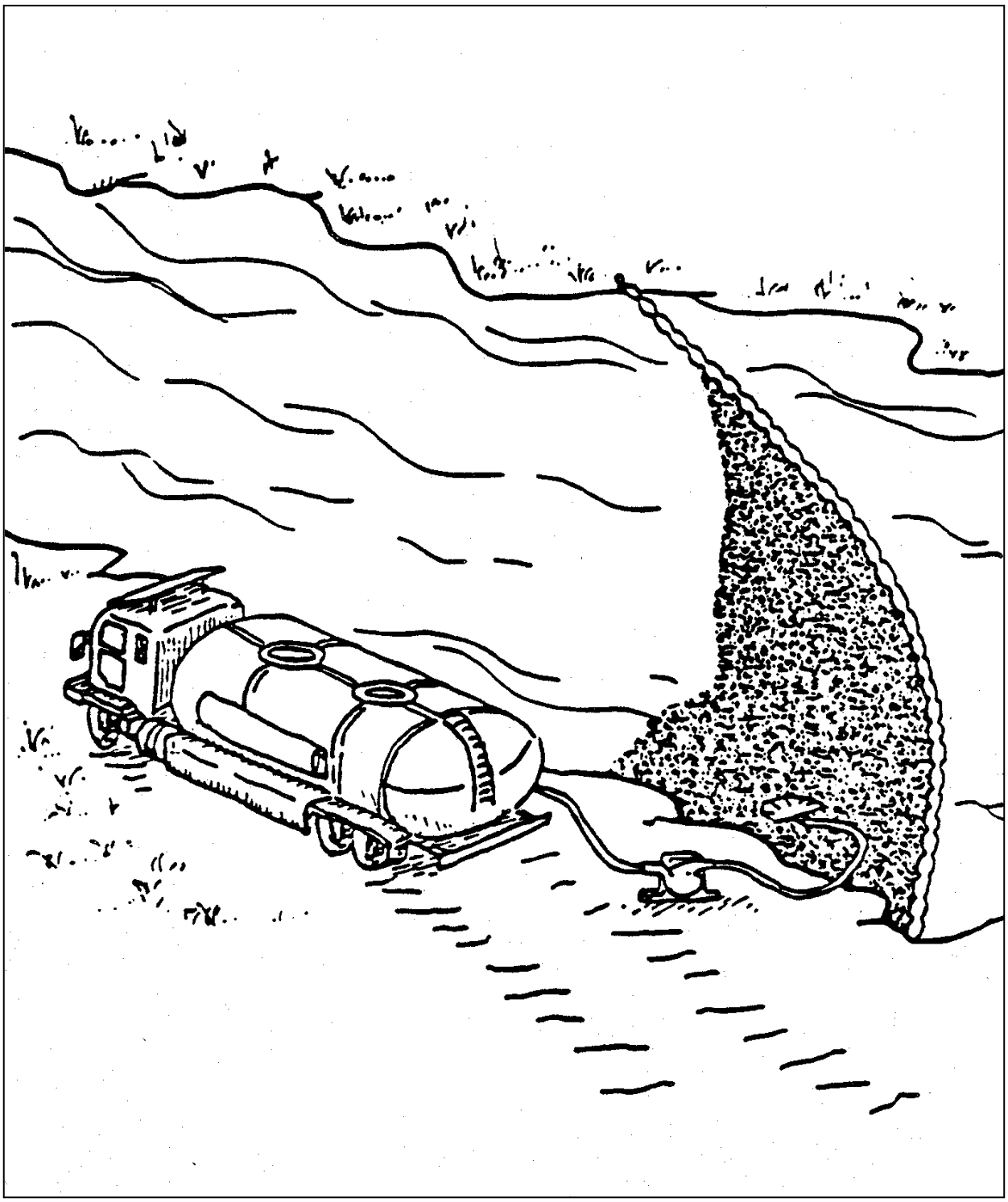


**Table 2.5 2**
**Logistical Requirements for Portable Skimmer/Pumps**

| Logistics | Typical Recovery Rate for Thick Oil Layer (2 mm) | Typical Recovery Rate for Thin Oil Layer (.1 mm) |
|---|---|---|
| **Equipment** | | |
| High capacity trash pump w/3" suction hose | 75 gpm (50% oil) | 50 gpm (5% oil) |
| Portable weir skimmer | varies | varies |
| Portable disc skimmer | varies | varies |
| Number of pumps or skimmers | Dependent upon quantity of oil and rate of introduction to skimmer or pump. | |
| **Personnel** - 1 person per pump suction hose, 1 to 2 persons for skimming and concentrating of oil, and 1 supervisor. | | |
| **Support** | **Range of Capacities** | |
| • Vacuum truck | 6 to 140 barrels | |
| • Tank truck | 20 to 160 barrels | |
| • 3" Suction hose | 300 to 400 gpm max. | |
| • Pillow tanks | 2 to 2,500 barrels | |

**Figure 2.5-3**
**Contained Oil Skimming with Portable Skimmer**

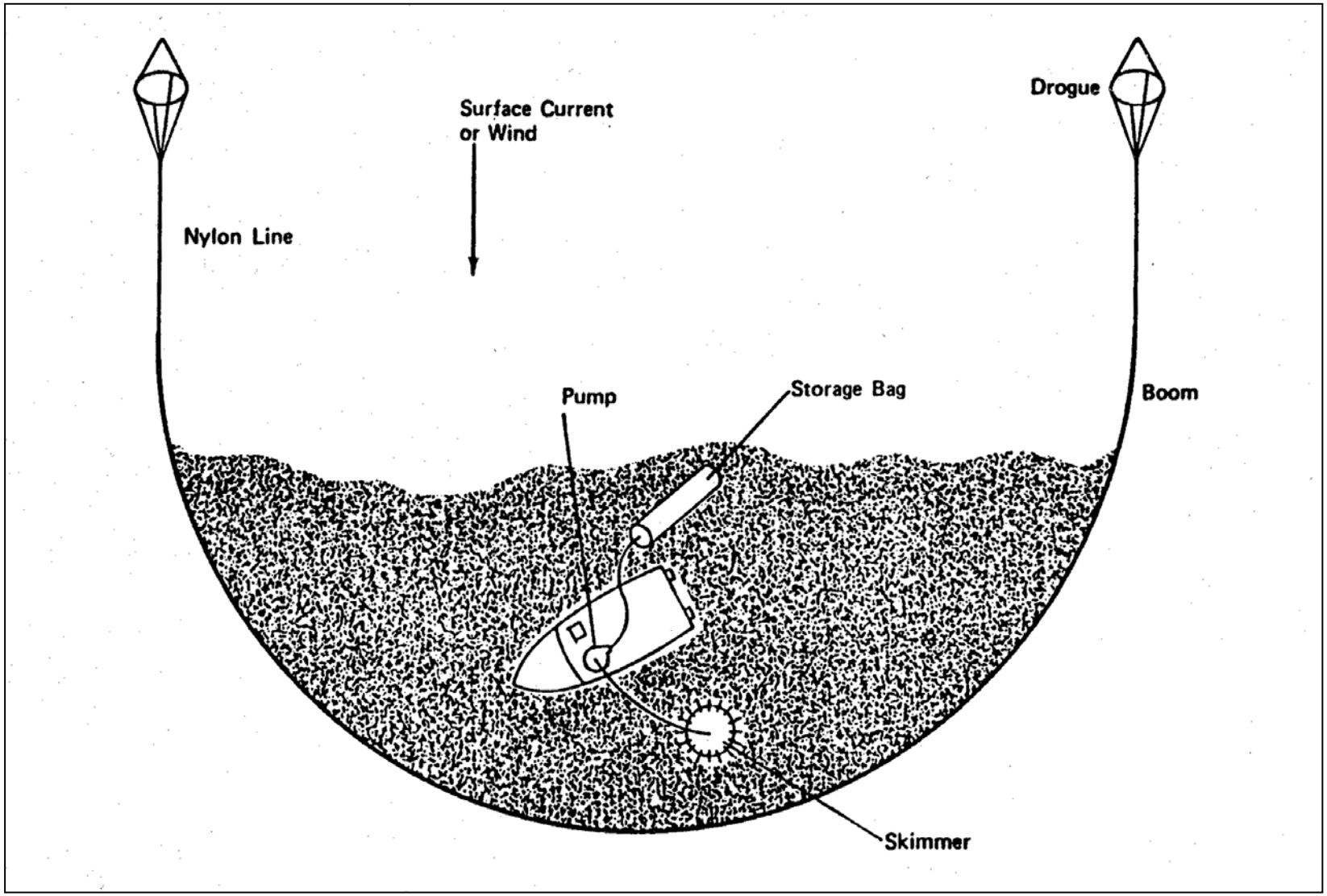
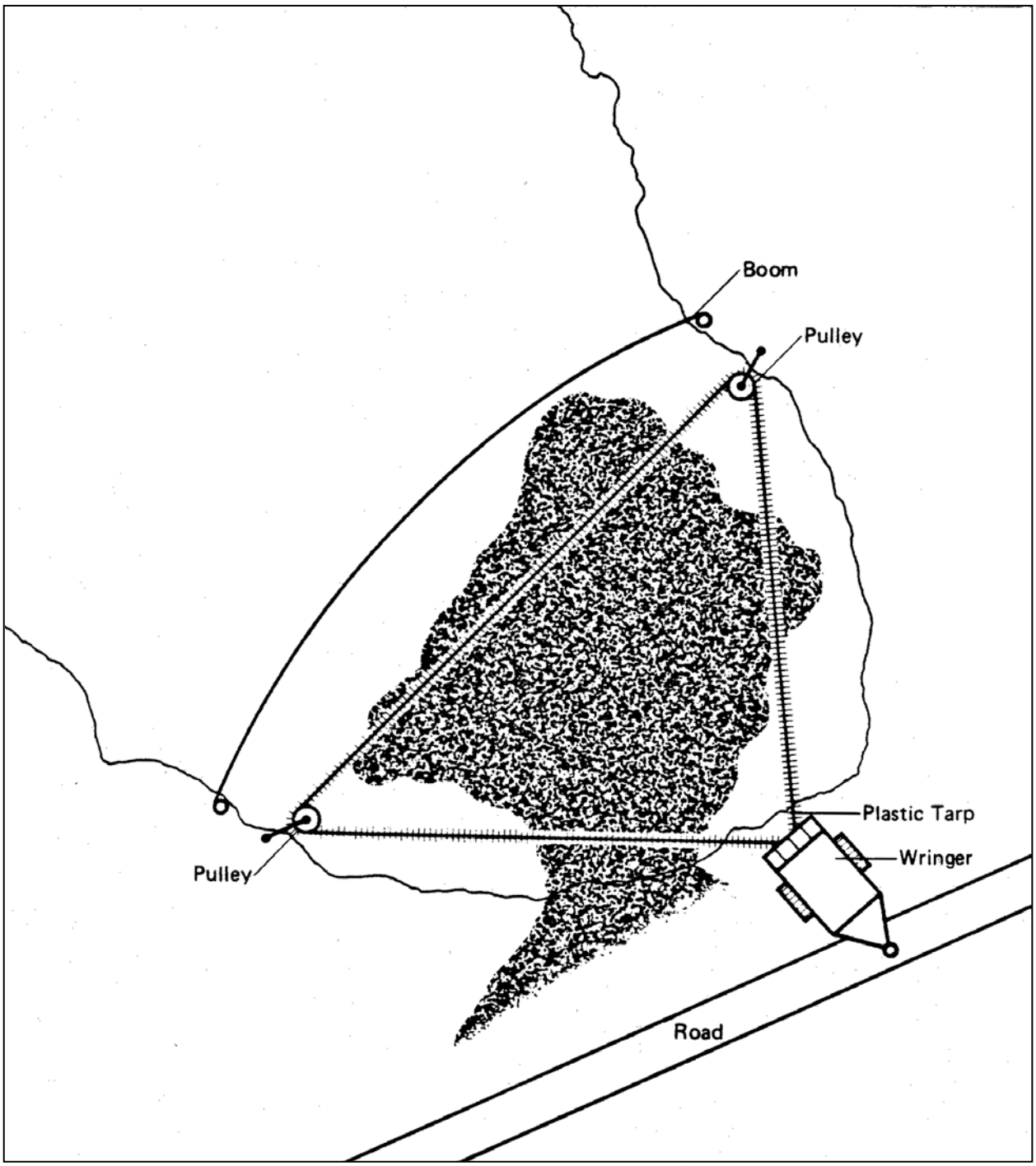


**Figure 2.5-4**
**Endless Rope Skimmer**



## 2.5.3 Open Water Skimming

**Objectives**. To recover large contained or uncontained spills on open water areas using self-propelled or towed skimmers.

**Limitations**. High viscosity or solidified oils, and adverse environmental conditions (e.g., wave height, currents, winds).

**General Instructions**. Large spills contained by booms are best recovered using self-propelled skimmers operating within the containment area to continually remove the heaviest oil concentrations. Portable skimmers are used to recover any remaining patches of oil. Sheens are cleaned up with sorbents, or left to disperse naturally.

A self-propelled or towed skimmer with booms to concentrate the oil is usually required for large uncontained spills. Figure 2.5-5 shows the proper relationship of boats, booms, skimmer, and oil slick when it is possible to contain the entire leading edge. Use bridles to stabilize booms and maintain proper con-figuration. If the slick is too wide for complete containment, begin skimming on the downwind side and make successive passes across the slick, staying on the downwind side as shown in Figure 2.5-6. Skimming velocity for most skimmers should be approximately 1 to 2 knots. Re-covered oil is kept onboard the skimmer if adequate storage exists, or pumped into a barge or floating storage container towed behind the skimmer.

**Logistics**. The logistical requirements are directly related to the areal extent and thickness of the slick. The amount of oil a skimmer encounters is the primary factor determining the recovery rate, not the skimmer's rated capacity. Figure 2.5-7 can help determine the encounter rate of a skimmer with a known sweep width and skimming speed for various surface concentrations of oil per acre (or slick thickness). The encounter rates represent an ideal situation and do not reflect any time lost for maneuvering, offloading of recovered oil, or transit time to an offloading site.

**Variations**. Self-propelled skimmers can operate alone to recover uncontained spills in the same manner as for use with booms. Small spills or streamers can be recovered using a single boom and boat and a self-propelled or towed skimmer as shown in Figure 2.5-7. Figure 2.5-8 shows the use of skimmers in stationary modes.

**Figure 2.5-5**
**Boat, Boom, and Skimmer Relationship**

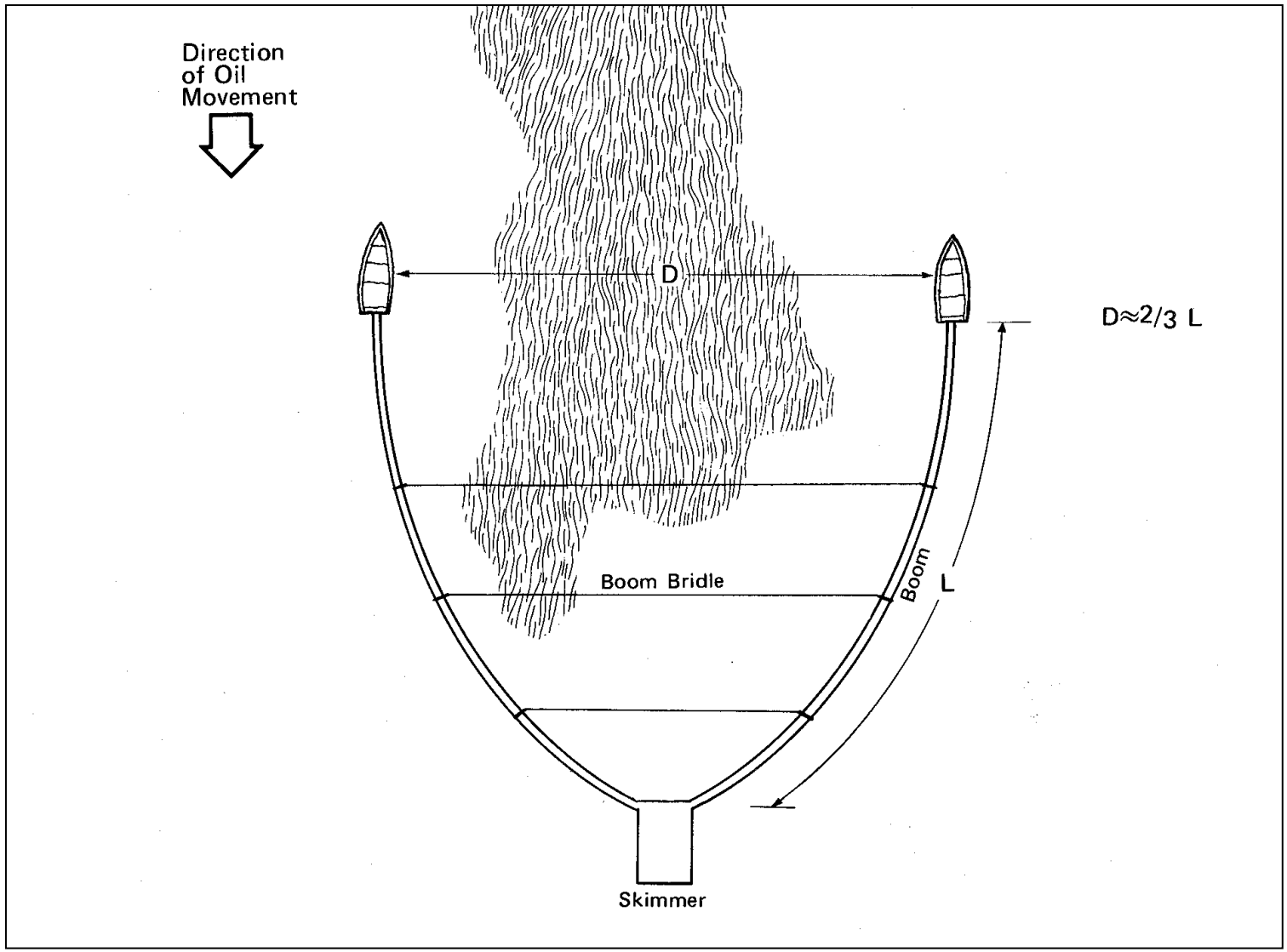


**Figure 2.5-6**
**Skimming a Larger Slick**

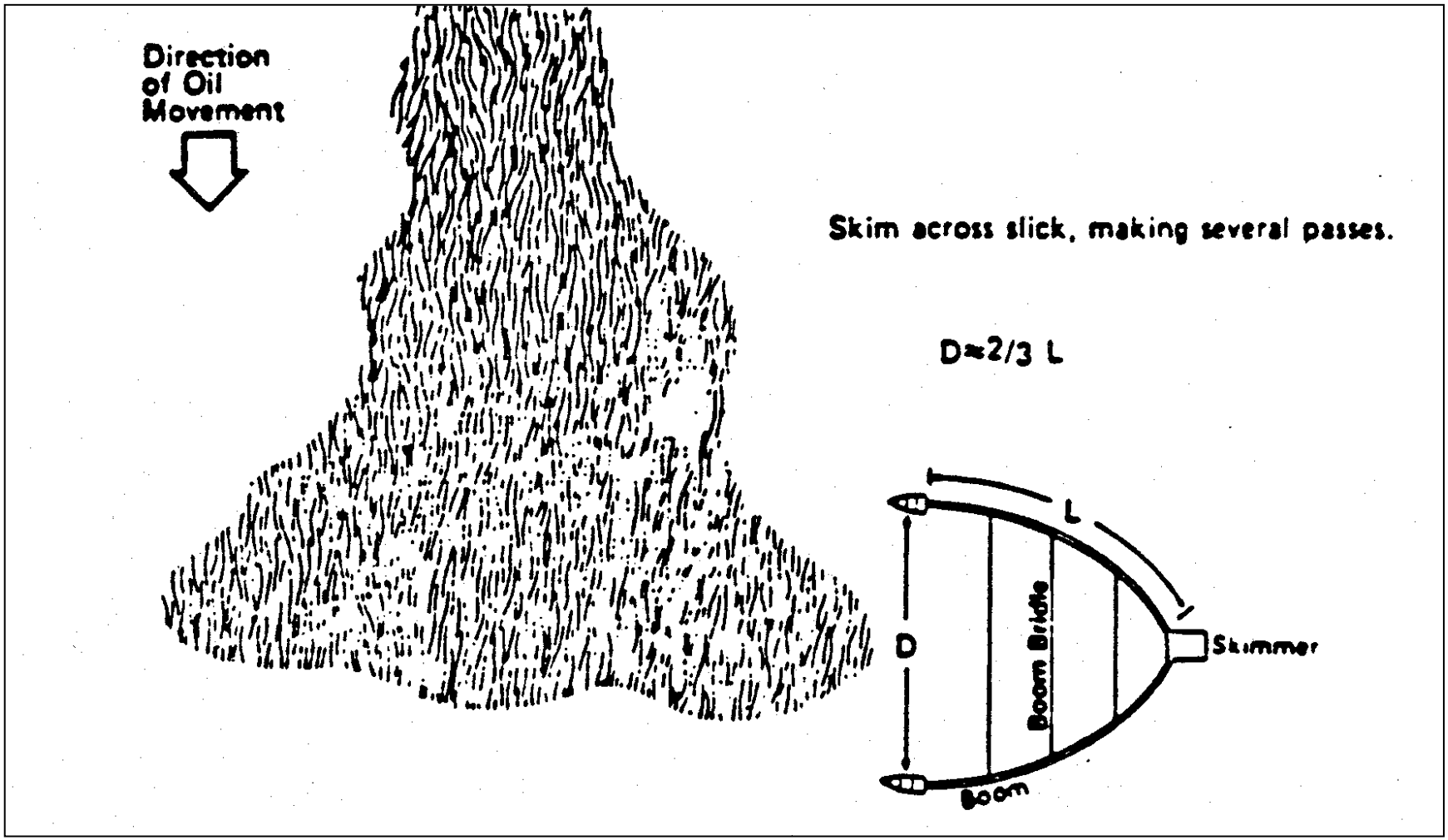


**Figure 2.5-7**
**Skimming with Single Boom**

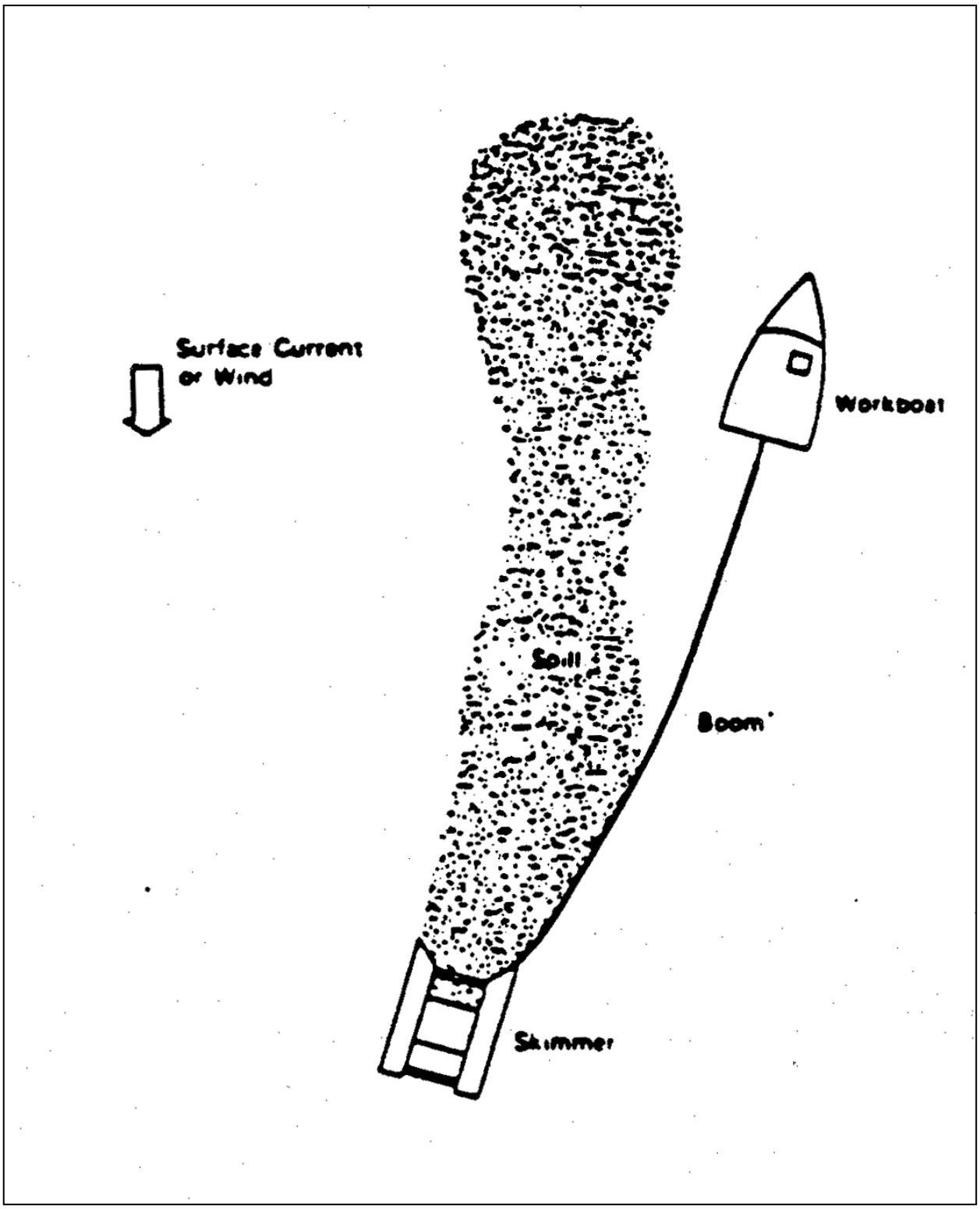


**Figure 2.5-8**
**Use of Skimmers in Stationary Mode**

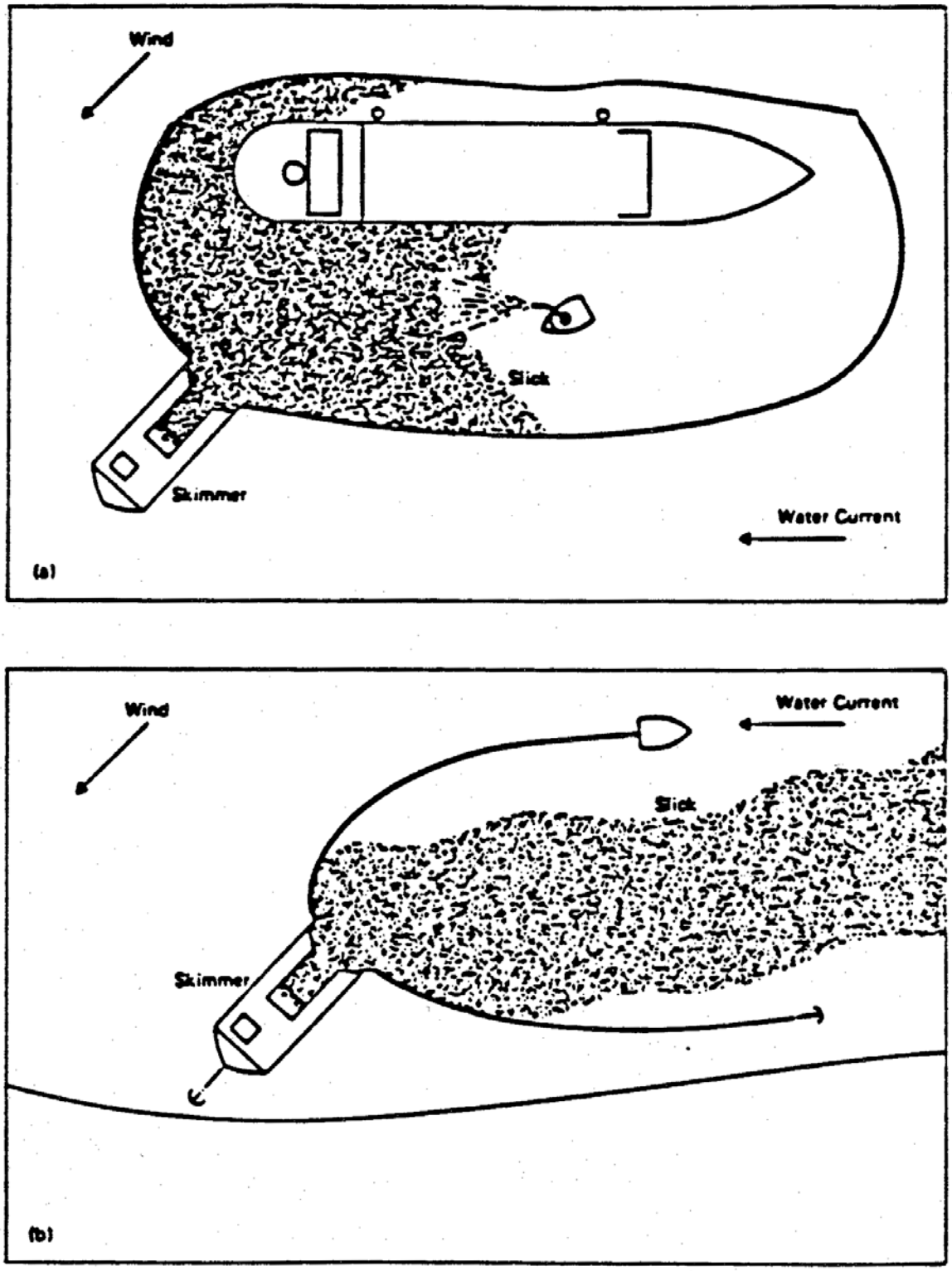
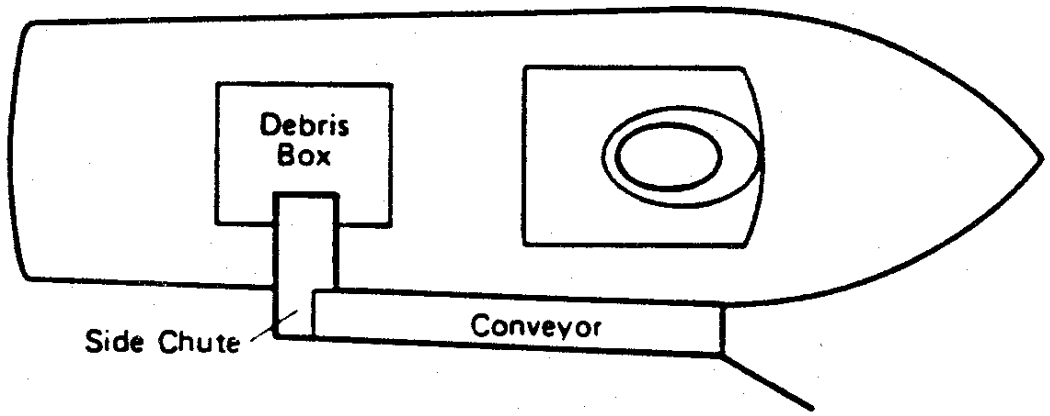
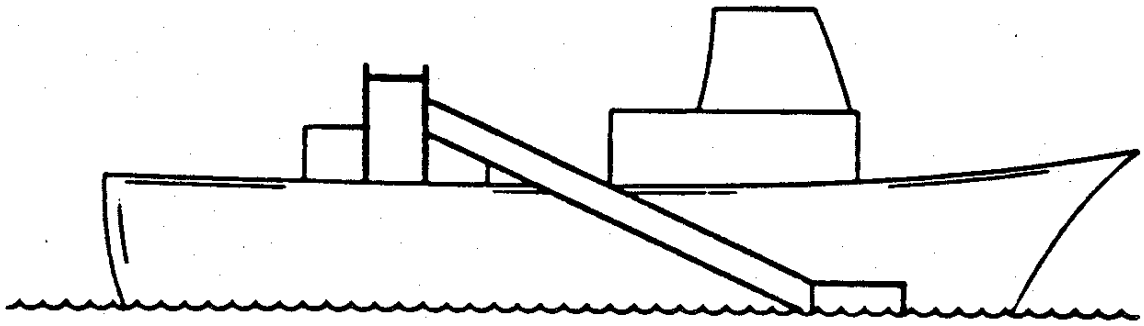


**Figure 2.5-9**
**Vessel Mounted Oil Recovery Conveyor**




A. Plan View



B. Side View

## 2.5.4 Sorbent Recovery

**Objectives**. To recover small quantities of oil from terrestrial or aquatic areas, especially films or sheens remaining after skimming or pumping operations have been completed.

**Limitations**. Solidified or highly weathered oil, recovery and disposal of oiled sorbents, and potential interface with granular sorbents by surface collecting agents, if used simultaneously.

**General Instructions**. Place sorbents directly on the oil and turn continually until completely oiled. Put oiled sorbents in plastic bags or leakproof containers and replace with clean ones. Inert substrates can be wiped clean with sorbent pads or sheets. Sorbent sweeps or booms may be pulled between two boats across aquatic areas or anchored across slow moving streams to recover sheens.

**Logistics**. The logistical requirements are heavily dependent on the type and degree of oiling and therefore cannot be accurately quantified prior to a spill. Some of the basic equipment and materials required for sorbent recovery are pitchforks, rakes, shovels, boats (if needed), and plastic bags, drums, debris boxes, or other leakproof containers.

**Variations**. Sorbents can be placed on the ground in areas of heavy spill activities to prevent oiling of facilities, paths, work areas, etc.

## 2.5.5 Ice Slotting and Trenching Techniques

Oil spilled under ice floats up against the underside of the ice and collects in pockets or irregularities. In the presence of currents, oil will become mobile and move downstream on watercourses or spread in the direction of current movement on bodies of water. The degree of movement will be affected by the irregularities under the ice as well as the currents. Subsequent freezing may also trap oil in the ice layer, which may then migrate towards the surface. Spill movement under ice is slower than in open water. Uninfluenced by wind, slicks follow the main current of the river and tend to stay in the center of the channel.

A floating spill moving on the ice and underneath it can be concentrated in slots cut in the ice and can be recovered by means of rope mop skimmers deployed in the slots (Figure 2.5-9). If the spill is thick enough, it can be removed using weir skimmers or direct suction. Booms can also be deployed through holes in the ice to recover a spill trapped in under-ice depressions. Two holes are drilled in the ice using augers or chain saws, and the boom is strung under the ice between the holes.

Before ice modifications can be used, the ice must be sufficiently strong to support personnel and heavy equipment.

**Ice Slotting Directions:**

- Determine ice slot location to contain any product from migrating downstream
- From the shore, cut a slot at a 30° angle upstream to the current (Figure 2.5.10). Slot width is about 1-1/2 times the ice thickness and must be wide enough to house the oil skimmer.

- Cut ice into blocs and push under ice on downstream side or lift block with crane or ice tongs.
- Slot should be cut with a slight "J" curve angle at the upstream side to provide current flow toward the shoreline recovery area.
- Remove ice chips from the slot and position skimmer or vacuum device at the downstream end to recover oil on its surface; oil is diverted along the back edges of the slot.
- Length of slot will be determined by width of river and position of slot deployment.
- Cut a second slot just downstream from first slot and extending from the opposite shore.
- If the oil has solidified, it will have to be shoveled out manually.
- Barrier (plywood) extending down into the water level may be fixed to the back edge of the slot to increase the holding capacity and prevent entrainment.

For small quantities of oil in low current waterways or when recovery equipment is unavailable, slots can be cut perpendicular to the current to contain but not concentrate the oil. A slot can also be cut to allow oil to flow "out and over" the surface of the ice. It should be perpendicular to the current and long enough to span the area of highest current velocity. The downstream wall is cut at a 45° angle sloping upstream (Figure 2.5-10). If possible, locate the slot over a natural high point in the river bottom or make one by dropping sandbags or large rocks through the slot. This causes the water level to rise in the slot and enhances the flow of oil and water out and over the ice. sorbents or snow are piled downstream to contain and absorb oil. Partial trenches can be cut to capture oil and facilitate recovery. Any trenches created in the oiled area can be stuffed with sorbents as necessary.

**Figure 2.5-9**
**Ice Slotting**

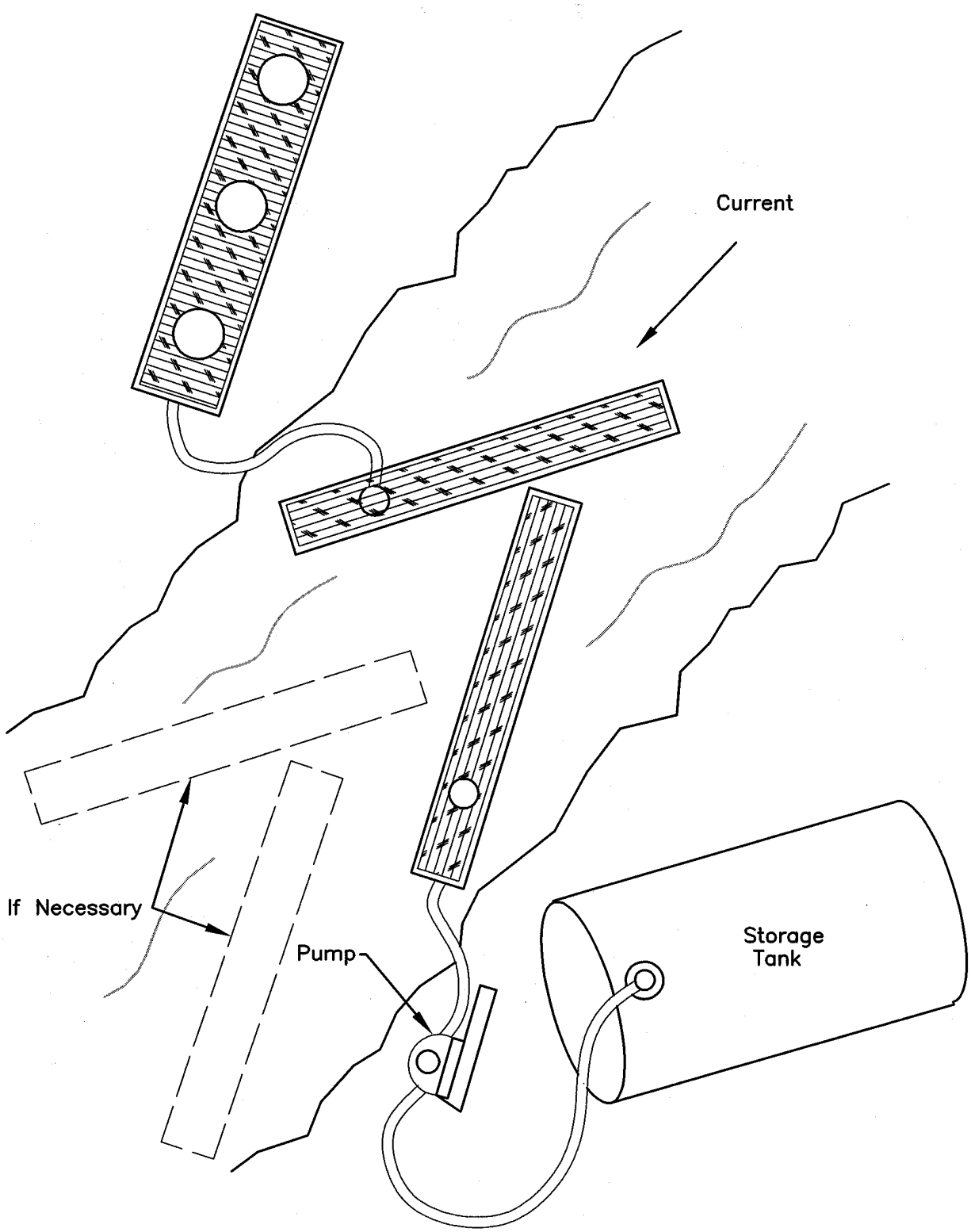
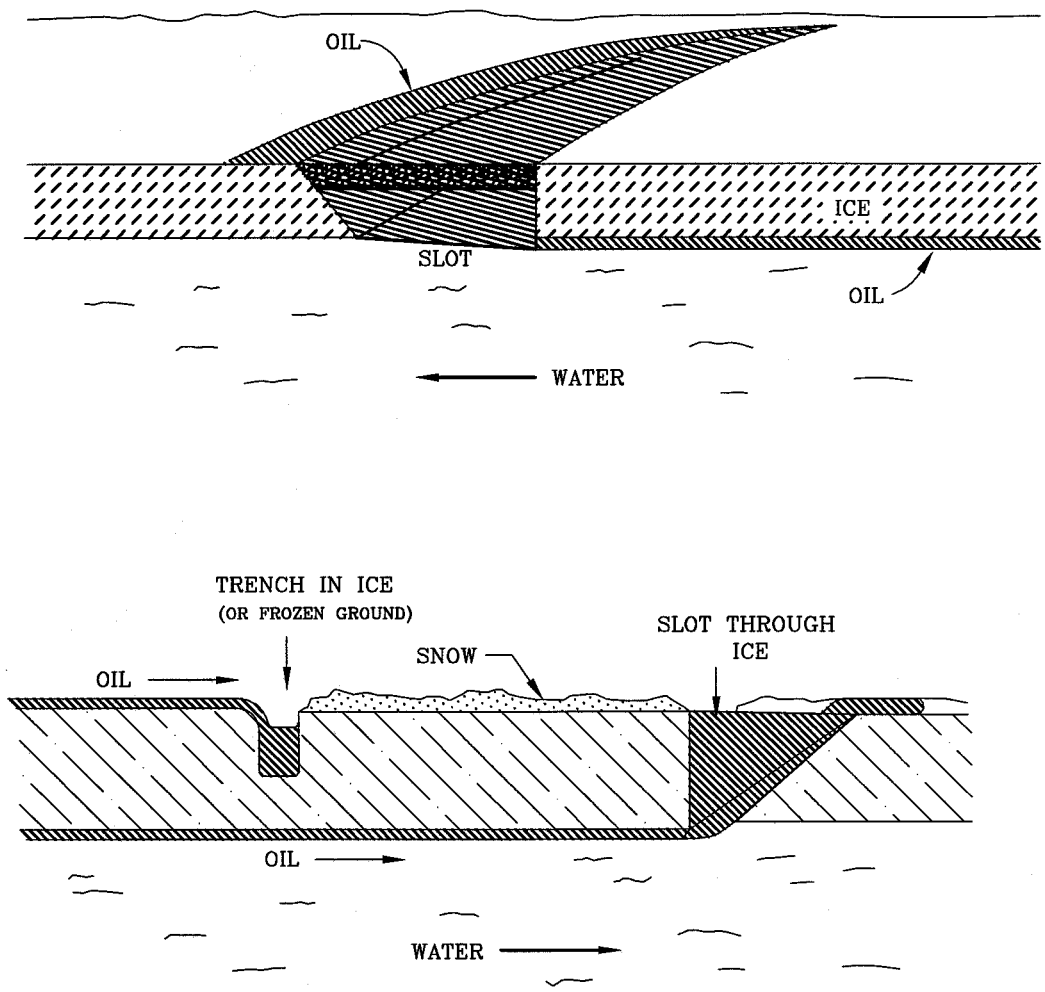


**Figure 2.5-10**
**Ice Slotting and Trenching**




CONTAINMENT OF OIL WITH TRENCHES AND SLOTS

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## 2.6 SHORELINE CLEANUP

### 2.6.1 Manual Recovery

**Objectives**. To recover oil using manual methods such as scraping, shoveling, brushing, etc., in areas inaccessible to cleanup equipment, with sporadic oiling, or as the final stage of a cleanup operation.

**Limitations**. Environmental sensitivity of area to intense human activity.

**General Instructions**. Remove small pools of oil with hand pumps or buckets, and oiled debris and vegetation with shovels, rakes, or pitchforks. Oil layers on rocky outcrops or cliffs, boulders, manmade structures, etc., are removed by scraping or wire brushing. Small quantities of oil or oily debris can be placed in plastic bags and removed for disposal. Larger quantities can be placed in barrels or debris boxes for disposal, or lined pits for temporary storage. On beaches or rivers all material must be stored above the high-water line. Oil and oiled materials can be removed manually or by truck, helicopter, boat, or barge.

**Logistics**. The primary logistical requirements for manual cleaning will vary with the degree of oiling. Table 2.6-1 gives the primary logistical requirements for both light and heavy oiling of a 1 mile by 50 foot area.

**Variations**. None.

**Table 2.6-1**
**Logistical Requirements for Manual Removal of Oiled Material[a]**

| | For Light or Sporadic Oiling | For Heavy Oiling |
|---|---|---|
| **Equipment** | | |
| • Debris box | 2 | 3-4 |
| • Helicopter (if used) | 1 | 1-2 |
| • Boat or barge (if used) | 1 | 2-3 |
| • Truck (if used) | 1 | 2-3 |
| **Personnel** | | |
| • Workers | 10-20 | 50-100 |
| • Supervisors | 1 | 2-3 |
| **Access requirements** -foot, light vehicular, shallow craft, or helicopter. | | |

[a] For 1 mile by 50 foot area.

## 2.6.2 Mechanized Recovery

**Objectives**. Removal of oiled sediments using various types of earthmoving equipment.

**Limitations**. Adequate access, environmental sensitivity and trafficability of spill area, substrate type, and approval by local authorities.

**General Instructions**. Operating instructions and recommended use for each type of equipment are discussed below, individually or in combination. Methods of operation for the various equipment is summarized on Table 2.6-2.

**Motor Grader/Elevating Scraper**. Used on sand and gravel beaches or unconsolidated soil where penetration does not exceed 1 inch. Also used on mud-flats if trafficability permits. Motorized graders cut and remove surface layer of oiled sediments, forming it into windrows which motorized elevating scrapers pick up and haul to unloading area or disposal site. Set the motor grader blade at a 140° angle from the direction of travel and the cut depth equal to the depth of oil penetration. Cast windrows parallel to the surf or along the length of the oiled area. Elevating scrapers straddle the windrows with the cutting blade also set to the depth of oil penetration, and pick up the windrows with their forward movement. Figure 2.6-1 shows the operational sequence for a motor grader/front-end loader/elevating scraper combination.

**Motorized Elevating Scrapers**. Used on sand, gravel, or unconsolidated soil substrates where oil penetration exceeds 1 inch or to remove tar balls, oil patties, or debris. Operate scraper parallel to the surf or along the length of the oiled area. Figure 2.6-2 shows the operation pattern for a motorized elevating scraper. Set cutting blade to depth of oil penetration, or a skim cut for oily debris removal. Once the hopper is full, the scraper is driven to the unloading area, where the collected material is dumped.

**Motor Grader/Front-End Loader**. Windrows are cast by a motor grader as described above. Front-end loaders are used in place of elevating scrapers to pick up windrowed material and transfer it to nearby unloading areas or directly into trucks for disposal.

**Bulldozer/Front-End Loader**. Used on coarse sand, gravel, or cobble beaches or rough terrain areas where penetration is deep, oiling extensive, and trafficability poor. Operate bulldozer to push oiled material into piles for removal by the front-end loader to a nearby unloading site or dump truck. The cut depth should not exceed the depth of oil penetration. When operating in a tidal environment, cleaning should be done at low tide and material pushed up the beach above the surf line.

**Backhoe**. Used to remove oiled sediments (primarily mud or slit) on steep banks where other types of equipment cannot operate. Position backhoe at the top of the bank with the boom fully extended. Maneuver the bucket to the downhill edge of oiling and move up the bank, scraping the layer of oiled sediments into it. The collected materials can be temporarily stockpiled on-site or loaded directly into dump truck.

**Table 2.6-2**
**Summary of Cleanup Techniques**

| | Equipment/Technique | Method of Operation |
|---|---|---|
| 1. | Combination of motorized graders and scrapers | Motorized graders cut and remove surface layer of sediments and form large windrows. Motorized scrapers pick up windrowed material and haul to disposal area for dumping or to unloading ramp-conveyor system for transfer to dump trucks. Screening system utilized to separate debris such as straw and vegetation from sediments when large amounts of debris are present. |
| 2. | Motorized elevating scrapers | Motorized elevating scrapers, working singly, cut and pick up surface layer of sediments and haul to disposal area for dumping or to unloading ramp-conveyor system for transfer to dump trucks. Screening system utilized to separate debris. |
| 3. | Combination of motorized graders and front end loaders | Motorized graders cut and remove surface layer of sediments and form large windrows. Front-end loaders pick up windrowed material and load material into trucks. Trucks remove material to disposal area or to conveyor-screening system for separation of large amounts of debris from sediments. |
| 4. | Front-end loader | Front-end loaders, working singly, cut and pick up surface layer of sediments and load material into trucks. Trucks remove material to disposal area or to conveyor-screening system for separation of large amounts of debris from sediments. |
| 5. | High Pressure Flushing | High pressure water jets remove oil from solid surfaces, and runoff oil/water is controlled and collected. |
| 6. | Steam and Hot Water Cleaning | High-pressure steam or hot water heats oil, allowing it to flow off a surface for collection. |
| 7. | Water Flooding | High volume, low pressure water is used to move stranded oil into collection trenches where it can be contained, concentrated, and collected. |
| 8. | Bioremediation | Nutrients or genetically-engineered micro-organisms are applied to areas to accelerate the natural degradation of oil. Formal approval for use must be obtained. |

**Figure 2.6-1**
**Motor Grader/Front-End Loader/Elevating Scraper Operational Sequence**

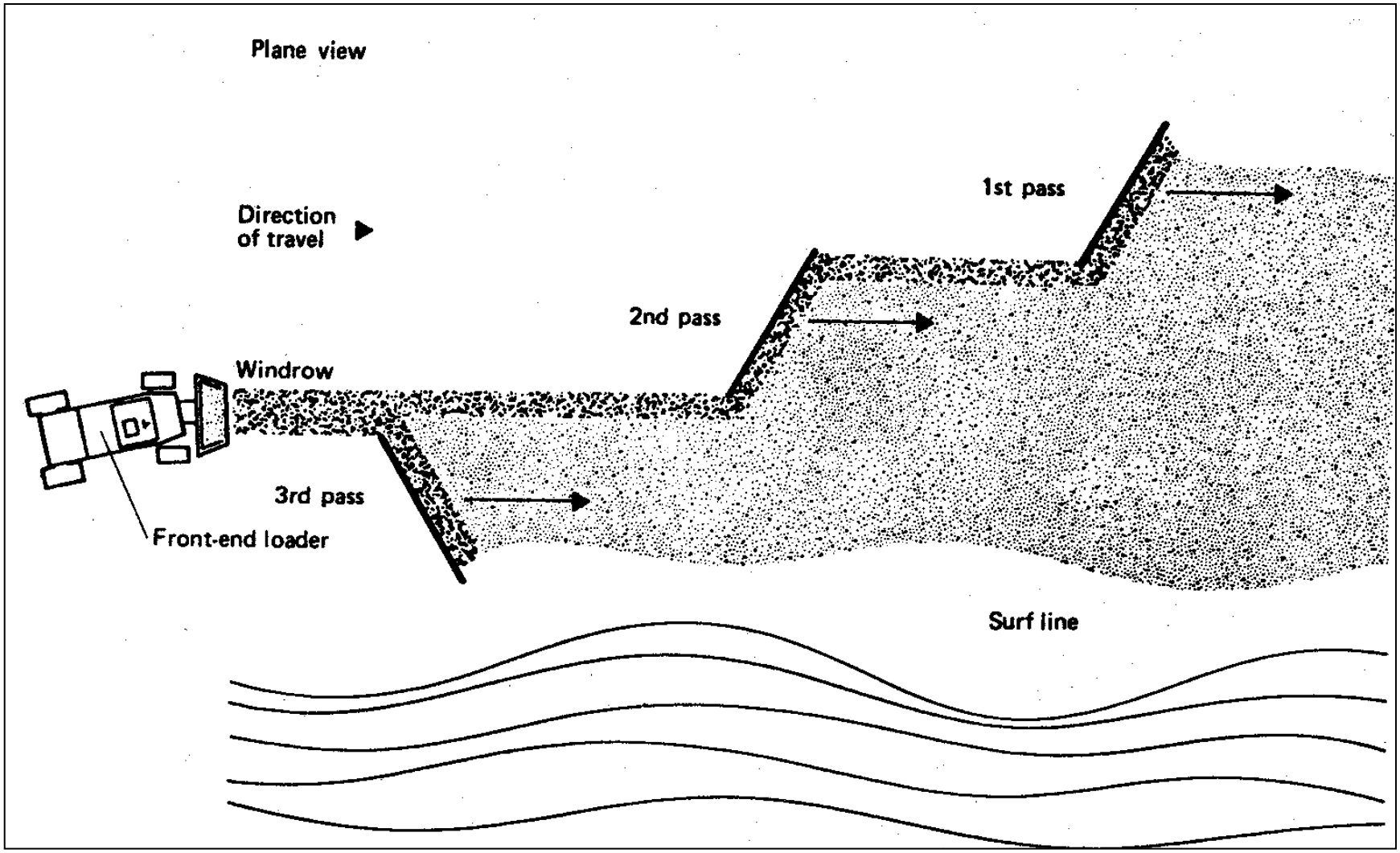
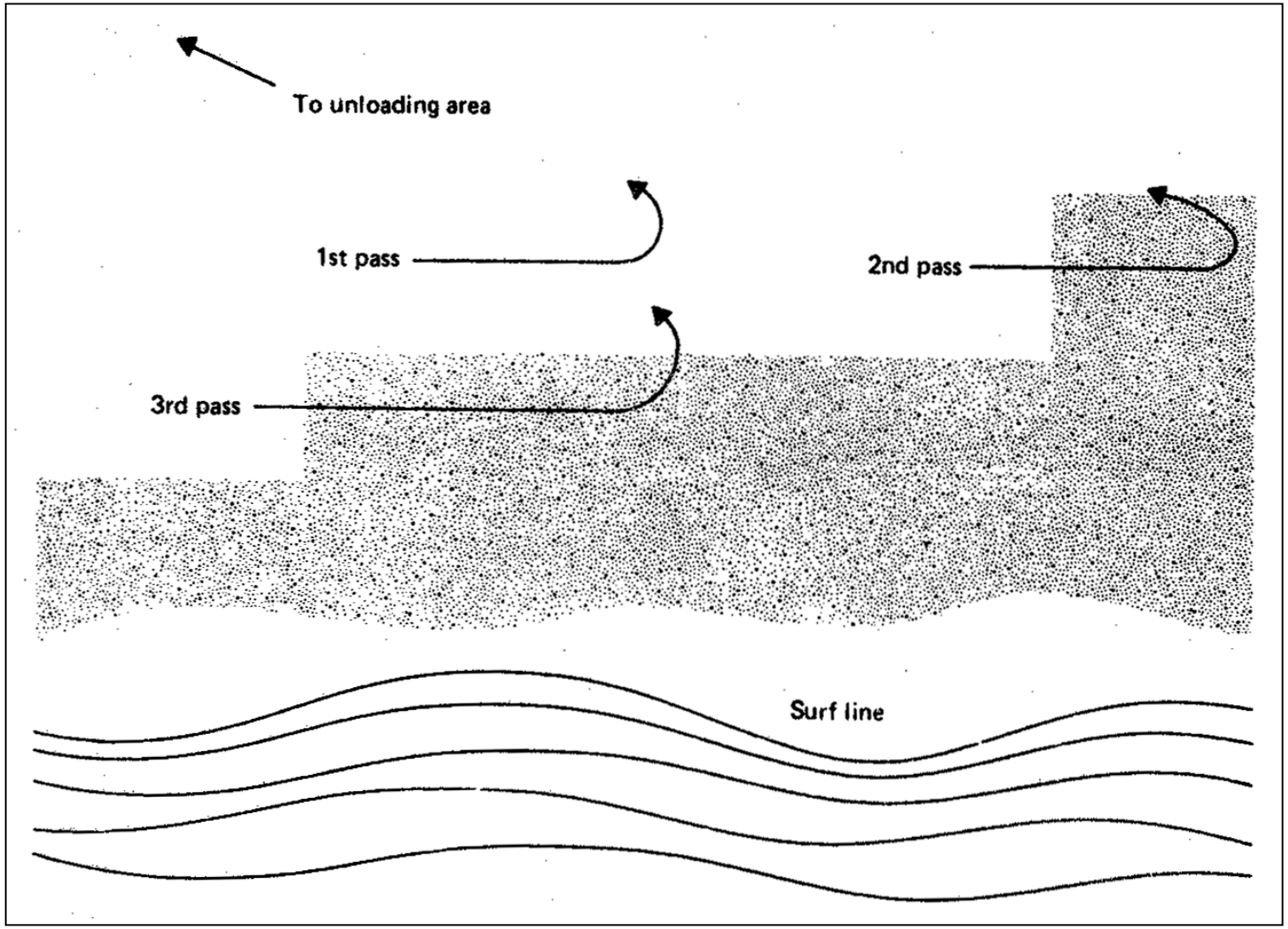


**Figure 2.6-2**
**Operation Pattern for a Motorized Elevating Scraper**



**Front-End Loaders**. Primarily used to load stockpiled or windrowed material into trucks but may be used to pick up debris or to clean areas with patchy oiling and/or poor trafficability. Front-end loaders are either rubber-tired or tracked and are fitted with buckets for various uses and with capacities ranging from 3/4 to 10 cubic yards. Rubber-tired loaders with 4-in-1 buckets are preferred. Bucket should only be filled to 2/3 capacity to prevent spillage during transport and loading. Figure 2.6-3 shows the operational sequence for a front-end loader.

**Hauling Trucks**. All trucks shall be lined with precut plastic sheets before loading, to prevent oil from leaking onto the streets. New liners shall be used for each load. Tarpaulin covers may be used to minimize blowing or spilling of loads. Washing of truck wheels with pressure water hoses may be required before trucks leave the transfer locations to avoid tracking oil onto city streets. Trucks may be loaded with wheel type front-end loaders. The time required for hauling oiled sand from the transfer locations to the recovery, recycling treatment and/or disposal facility will depend on the type and number of trucks used. The most suitable and available type of trucks are 10-wheel single-bed dumps or truck-trailer combinations. Ten-wheel dump trucks have a capacity of approximately 8 cubic yards.

**Discing**. For small spills of very light oil or for final cleanup, the most effective cleanup technique may be a simple "discing-in" of the oil. Before this procedure can be used, the appropriate officials must review and approve the discing-in method.

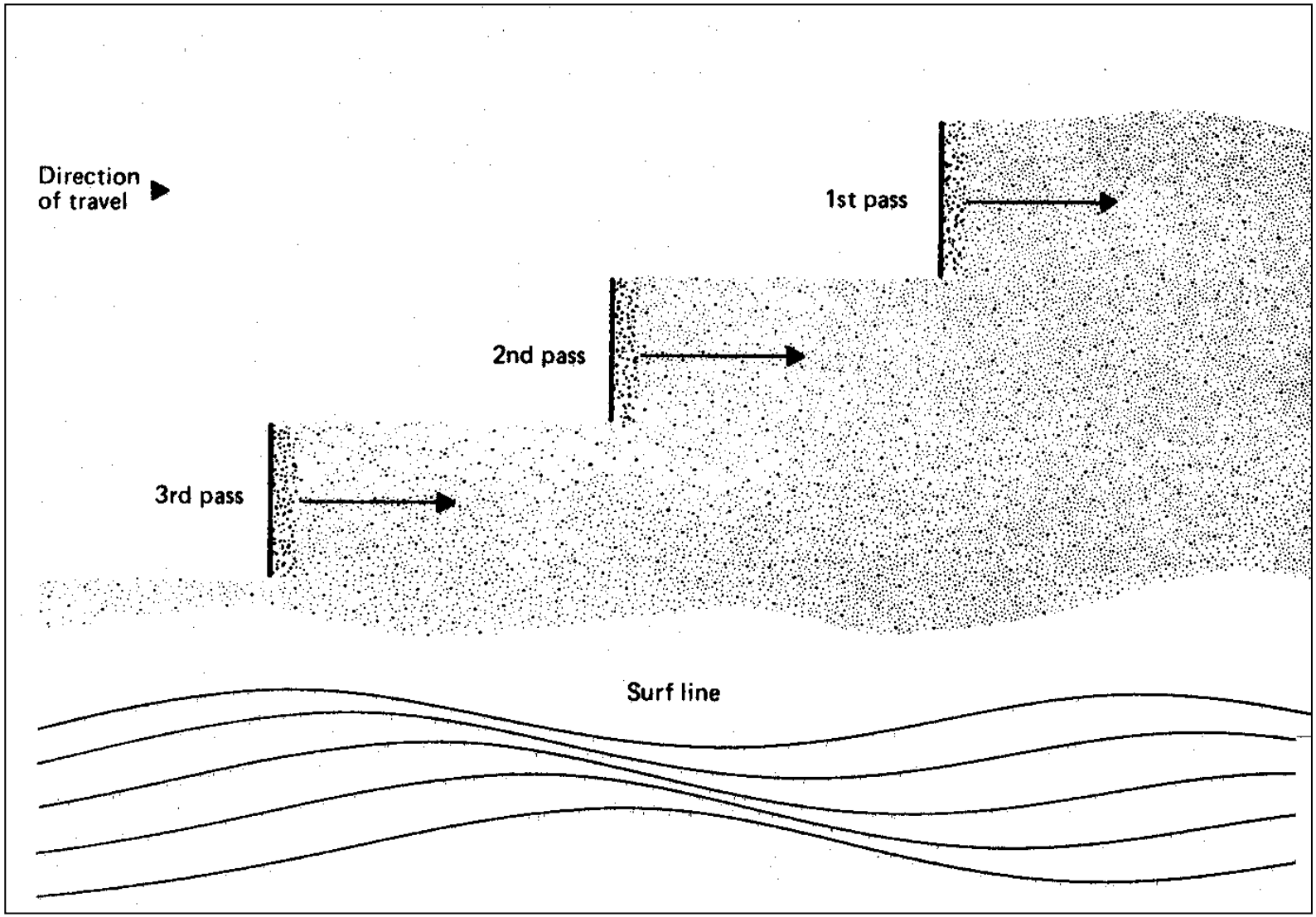
In this technique the oil is not removed but buried into the top layer of sediments and left to degrade naturally. The application of fertilizers to enhance biodegradation is often used in combination with this technique. Bioremediation is discussed in Section 2.6.8. The oil is disced into the sediment using a tracked loader or tractor towing a discer. The following procedure shall be followed:

1. Begin discing along the shoreward edge of the oiled area.
2. Operate the tractor in second gear and continue to the end of the oiled area.
3. The tractor is turned around and a new pass is started adjacent to, and slightly overlapping the previous pass.

**Logistics**. The primary logistical requirements depend heavily on the loading capacity of the equipment, and the haul distance to the unloading area. The primary logistical requirements for each of these techniques to clean a 1 mile by 50 foot oiled area are given in Table 2.6-3.

**Variations**. None.

**Figure 2.6-3**
**Operational Sequence for a Front-End Loader**



## Table 2.6-3
## Logistical Requirements for Mechanized Recovery[a]

| Technique and Equipment | Load Capacity | Number of Units Required For: No Haul Distance | 100 ft. Haul Distance | 500 ft. Haul Distance | 2,000 ft. Haul Distance | No. of Truck Loads/Hour | Diesel Fuel Requirements, Gal/Hour | Individual or Combined Cleaning Rate |
|---|---|---|---|---|---|---|---|---|
| **Motor Grader/Elevating Scraper*** | | | | | | | | |
| Motor grader | | | 1 | 1 | 1 | | 3-6 | |
| Elevating scraper | 20 $yd^3$ | | 1 | 2 | 4 | | 9-15 | 1-½ hr/acre |
| Elevating scraper | 10 $yd^3$ | | 1 | 4 | 8 | | 11-18 | |
| **Motor Grader/Front-End Loader** | | | | | | | | |
| Motor grader | 3 $yd^3$ | 1 | 1 | 1 | | | 3-6 | |
| Loader - rubber tired | 3 $yd^3$ | 1 | 2 | 4 | | | 2-6 | 1-½ hr/acre |
| Loader - tracked | 10 $yd^3$ | 1 | 2 | 6 | | | 5-8 | 1-¾ hr/acre |
| Dump truck | | | | | | 19 | 6-12 | |
| **Bulldozer/Front-End Loader** | | | | | | | | |
| Bulldozer | 3 $yd^3$ | 1 | 1 | 1 | | | 4-14 | |
| Loader - rubber tired | 10 $yd^3$ | 1 | 2 | 4 | | | 2-6 | 5-¼ hr/acre |
| Dump truck | | | | | | 23 | 6-12 | |
| **Front-End Loader** | | | | | | | | |
| Loader - rubber tired | 3 $yd^3$ | 1 | 2 | 4 | | | 2-6 | 3-½ hr/acre |
| Loader - tracked | 13 $yd^3$ | 1 | 2 | 6 | | | 5-8 | 4-½ hr/acre |
| Dump truck | 10 $yd^3$ | | | | | 23 | 6-12 | |
| **Backhoe** | | | | | | | | |
| Backhoe | 16 $ft^3$ | 8 | | | | | 2-4 | 7 hr/acre |
| Backhoe | 12 $ft^3$ | 4 | | | | | 2-4 | |
| Dump truck | 10 $yd^3$ | | | | | 23 | 6-12 | |
| **Personnel** - 1 operator for each piece of equipment and 1 supervisor. | | | | | | | | |
| **Access** - Heavy equipment, barge, or landing craft. | | | | | | | | |

* Logistical requirements for the elevating scraper operating alone are the same as those listed for motor grader/elevating scraper.

[a] For 1 mile by 50-foot area.

### 2.6.3 Flushing

**Objectives**. To remove oil from manmade structures, rocky, boulder, cobble, or sandy shorelines, or any substrate with relatively few or no living organisms, by flushing with high- or low-pressure water streams. Prior to the use of high-pressure flushing, qualified personnel should inspect oiled surfaces for biological activity. In many instances the use of high-pressure will remove attached plant and animal life. Several years may be required to recolonize the areas.

**Limitations**. Accessibility and substrate erosion potential.

**General Instructions**. Begin flushing at the highest point of oiling, working down to the lowest point. In tidal areas it should be timed so that the lowest point is reached at low tide. Oil flushed off by the water streams can be recovered by using berms, boards, or trenches to channel the oil to a sump or other collection point for recovery. For aquatic areas, the oil may be allowed to run back into the water where containment booms have been positioned. Pumps, vacuum trucks, skimmers, and/or sorbents are used to recover oil from the containment or collection points. Place plastic sheets over adjacent surfaces to prevent reoiling and direct oil and water to the desired area. For large areas a series of berms or ditches is used to channel the oily runoff to recovery areas as shown in Figure 2.6-4. High-pressure flushing (hydroblasting) is used for removing sticky, weathered, or high-viscosity oils from solid substrates, whereas low-pressure flushing should be used for non-sticky oils or unconsolidated substrates.

**Logistics**. The primary logistical requirements for using hydroblasting or low-pressure flushing to clean a 1 mile by 50 foot lightly oiled area are approximated in Table 2.6-4.

**Variations**. If authorized by the FOSC, dispersants may be mixed in low concentrations with the flushing water to aid oil removal and prevent reoiling by, and recoalescing of, the removed oil. Low-pressure water streams are also used to flush out oil stranded in backwater areas or under docks and herd it into containment or recovery devices.

**Figure 2.6-4**
**Low Pressure Flushing Tactics**

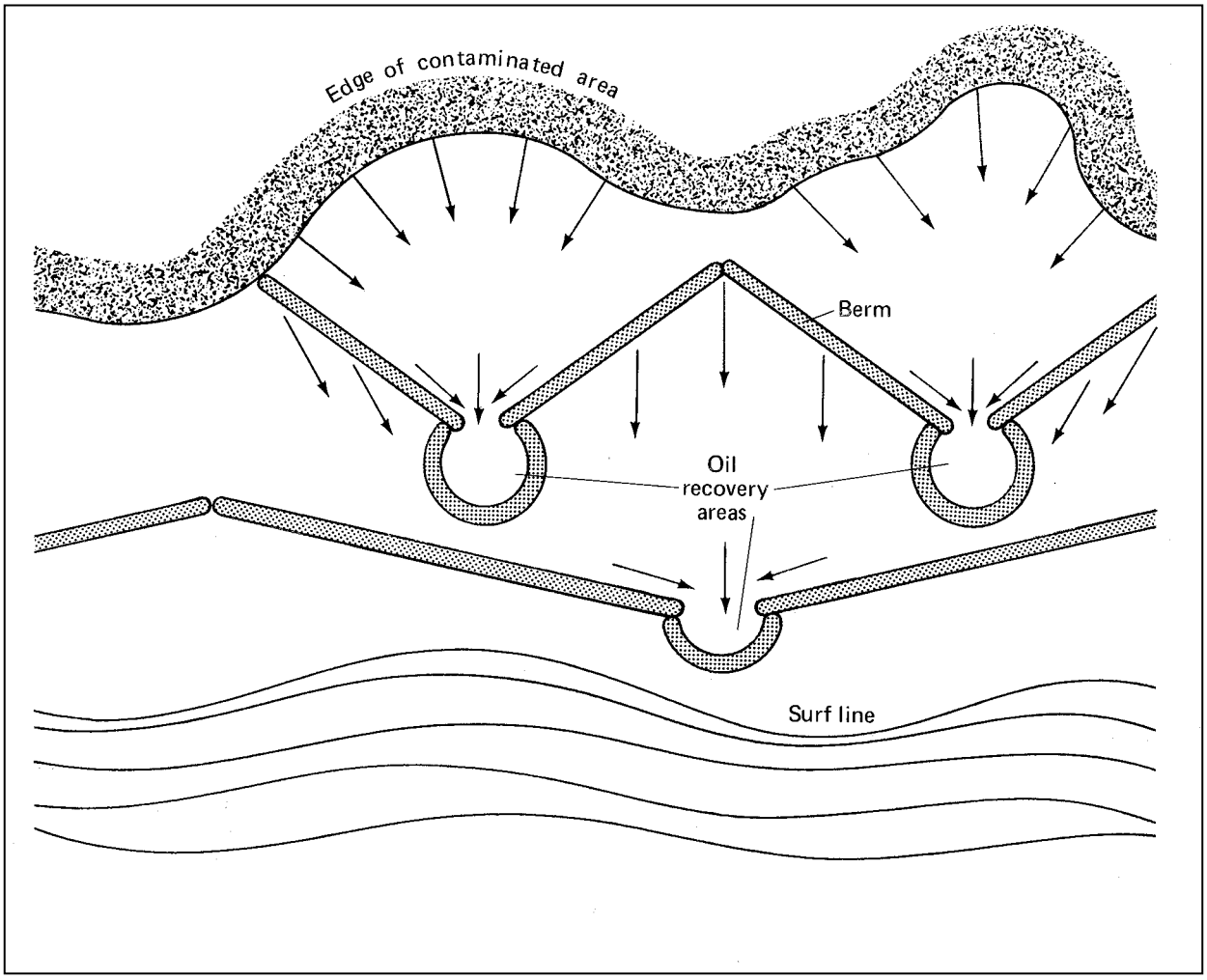


**Table 2.6-4**
**Logistical Requirements for Flushing Inert Substrates**

| | Type | No. Required |
|---|---|---|
| **Equipment** | | |
| • Hydroblasting unit | Self-contained, 10 gpm, @ 4,000 to 12,000 psi | 2-3 |
| • Flushing unit | Pump and hoses, 50 to 100 gpm @ 10 to 20 psi | 3-5 |
| **Support** | | |
| • Vacuum Truck | 60 to 80 bbl. capacity[1] | 1 |
| | 110 bbl. capacity[2] | 1-2 |
| • Trash pump and tank truck | 25 to 50 gpm[1] | 1 |
| | 50 to 75 gpm[2] | 1-2 |
| | 60 to 80 bbl. capacity[1] | 1 |
| | 110 bbl. capacity[2] | 1-2 |

**Personnel** - 1 to 2 operators per flushing or hydroblasting unit and 1 to 2 per recovery equipment, and 1 supervisor.

**Access requirements** - heavy equipment; barge or landing craft for trucks and light vehicles; shallow craft or helicopter for flushing unit.

[1] Hydroblasting

[2] Low-pressure flushing

## 2.6.4 Flushing Wetlands

**Objectives**. To remove concentrations of oil from wetland vegetation without significant sediment or vegetation disturbance by low-pressure water flushing.

**Limitations**. Accessibility and environmental sensitivity of the area. Most effective with nonsticky oils. Effectiveness limited with oiled sediments.

**General Instructions**. Test flush an area to determine effectiveness. Begin flushing at back of oiled area and work towards front. Flush from small boats whenever possible to avoid substrate disturbance. Any direct application of water stream to oiled substrate is undesirable, as erosion or damage to flora and fauna may result. Bathing the substrate will generally float oil off the surface without any adverse effects. Oil must also be removed from plant stems and leaves. Channel oily runoff with berms or trenches to containment pits or sumps for recovery. It may also be flushed back into the water within the confines of a boom and herded to a recovery point with water jets as illustrated in Figure 2.6-5.

**Logistics**. The primary logistical requirements for cleaning as 1 mile by 50 foot oiled area are given in Table 2.6-5.

**Variations**. None.

### 2.6.5 Wetland Cutting

**Objectives**. To manually or mechanically remove oiled vegetation where required to avoid leaching, reoiling, or direct oiling of biota.

**Limitations**. Accessibility, water depth, and environmental sensitivity to cutting or to heavy foot traffic associated with manual methods.

**Logistics**. The primary logistical requirements for a 1 mile by 50 foot area are presented in Table 2.6-6.

**Figure 2.6-5**
**General Wetland Flushing Tactics**

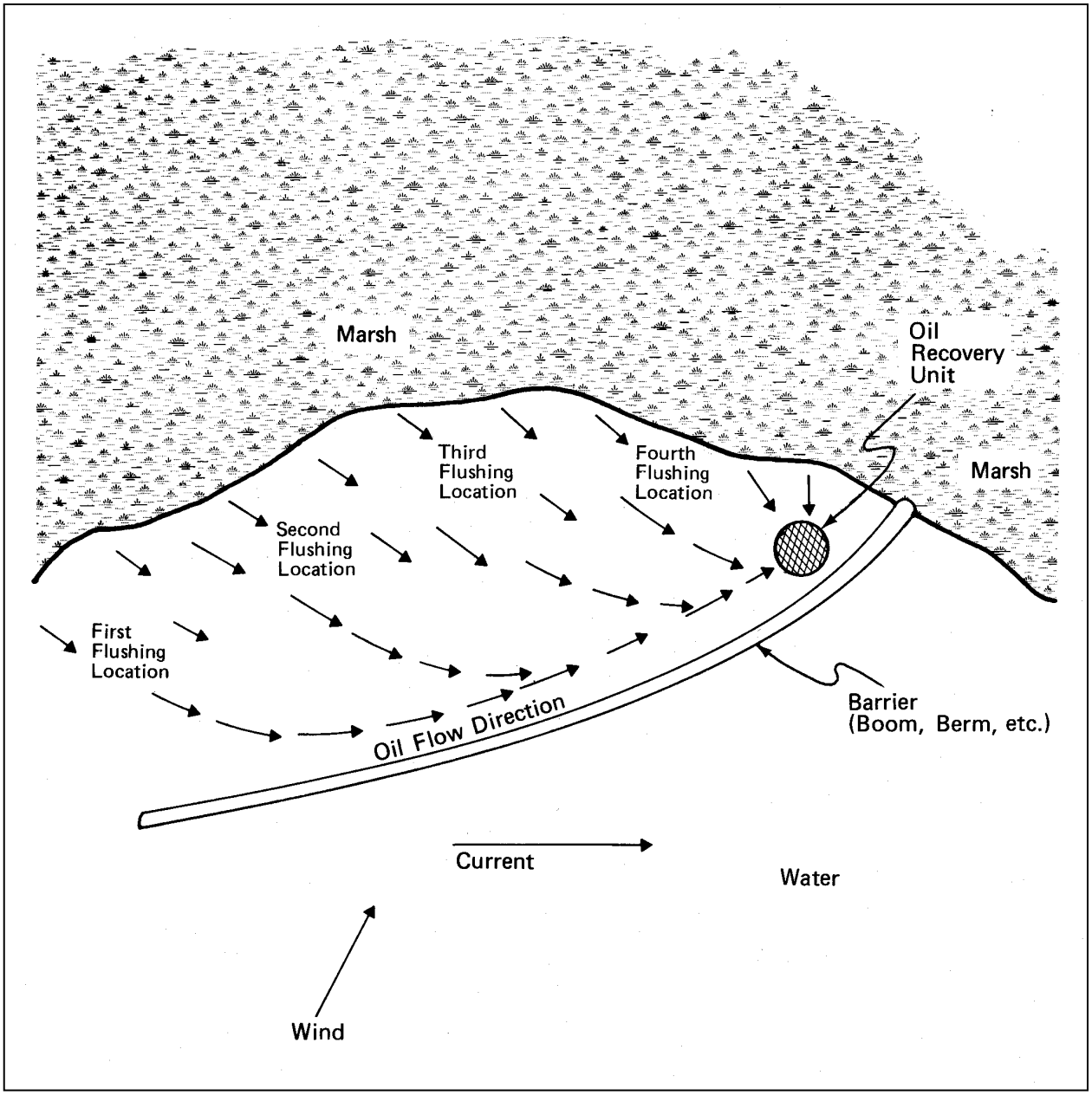


**Table 2.6-5**
**Logistical Requirements for Flushing Wetlands[a]**

| | Type | Number Required |
|---|---|---|
| **Equipment** | | |
| • Flushing unit (pump and hoses) vacuum truck | 10-20 psi pressure @ | 3-5 |
| | 50-100 gals/min | 1-2 |
| | 110 barrel capacity | |
| or | | |
| • Trash pump and tank truck | 50-75 gals/min | 1-2 |
| | 125 barrel capacity | 1-2 |
| **Personnel** - 1 to 2 per flushing or recovery unit and 1 supervisor. | | |
| **Access requirements** - heavy equipment, barge or landing craft for trucks and light vehicular, shallow craft, or helicopter for flushing unit. | | |

[a] For a 1 mile by 50 foot area.

**Table 2.6-6**
**Logistical Requirements for Wetland Cutting[a]**

| | Number Per Crew |
|---|---|
| **Equipment** | |
| • Aquatic weed cutter | 2 |
| • Kelp harvester | 2 |
| • Cutting tools - (Scythes, power cutters, shears, etc. | 3-4[b] |
| • Collecting tools - (pitchforks, rakes, etc.) | 4-6 |
| • Plastic or burlap bags | 75-100 |
| • Rolls of ground cover - (plastic film, burlap, sorbents, etc.) | 1-3 |
| **Personnel** - 5 crews of 10 workers each and 1 supervisor. | |
| **Access requirements** - foot, shallow craft, or helicopter. | |

[a] For a 1 mile by 50 foot area.

[b] Should have 1 or 2 extra in case of breakage or blades becoming dull.

### 2.6.6 Soil Removal

**Objectives**. Remove persistent oiled sediments in cases where no other treatment is possible.

**Limitations**. Environmentally damaging, expensive, replacement of removed material generally required, disposal problems.

**General Instructions**. Conduct detailed survey to determine the extent of removal required. Remove material using conventional earth moving or dredging techniques. Dispose of recovered oiled material. Replace removed material in type and quantity. Revegetate if necessary.

**Variations**. None.

## 2.6.7 Assisted Natural Recovery

**Objectives**. Application of in-situ treatments to the oiled area as a means of stimulating or accelerating natural degradation of the oil.

**Limitations**. Accessibility, trafficability, depth of penetration, energy level of marine shorelines, environmental sensitivity of the area to the oil, and public or private utilization of the area.

**General Instructions**. Several techniques have been developed to break up the oil layer or oiled substrate, thereby increasing the oil's surface area exposed to photochemical oxidation and microbial degradation. These techniques are primarily used on nonrecreational, low-amenity areas or coastal shorelines where sediment removal will cause backshore erosion. Each is described individually below.

- **Push Oil Sediments Into Surf**. Used on light to moderately oiled beaches where sediment removal may cause erosion. At low tide operate bulldozer to push the oiled sediments onto the lower intertidal area where the increased sediment movement breaks up the oil Sediments are returned to the beach through natural wave and tidal action.

- **Disc Into Substrate**. Used on lightly contaminated, nonrecreational sand or gravel beaches or inland substrates. Tow discing equipment by tractor or tracked loader. Conventional or chisel ploughs should be used where penetration exceeds 8 inches. Operate the tractor parallel to the surf line or perpendicular to the direction of slope for inland areas. Discing should be done periodically to aerate the sediments as much as possible.

- **Breaking Up Pavement**. Used on cobble, sand, or gravel beaches where thick layers of oil have formed an asphaltic pavement. Attach a ripper consisting of two or three large, curved teeth to the back of a tractor, tracked loader, or bulldozer and drag it through the pavement, breaking it up into smaller pieces. This allows natural wave action to further break up the pavement for rapid degradation.

- **Bioremediation**. Used in conjunction with discing on inland areas to accelerate or maintain a high rate of biodegradation. After discing, fertilize the oiled soil with a standard spreader, using a nitrogen, phosphorus, and potassium (NPK) inorganic fertilizer to supplement natural nutrient supplies. A general nitrogen to oil ratio of 1:10 by weight is recommended.

**Logistics**. The equipment required depends on the technique used and the size and degree of oiling. Table 2.6-9 gives the primary logistical requirements for assisted natural recovery. Most of the equipment needed are standard farm items.

**Table 2.6-7**
**Logistical Requirements for Assisted Natural Recovery**

| Item | 50 ft. Wide Area | 150 ft. Wide Area | Cleaning Rate |
|---|---|---|---|
| **Equipment** | | | |
| • Tractor/Ripper | 1 | 2 | 1-1/2 hr/acre |
| • Track-type tractor w/8 ft. wide discer | 1 | 1 | 1-1/2 hr/acre |
| • Track-type tractor w/12 ft. wide discer | 1 | 1 | 1/3 hr/acre |
| • Bulldozer | 2 | 5 | 1 hr/acre |
| • Spreader | 1 | 1 | N/A |

**Personnel** - 1 operator for each piece of equipment and 1 supervisor.

| Support | Diesel Fuel Requirements |
|---|---|
| • Tracked-type tractor | 2-1/2 - 9 gallons/hr |
| • Bulldozer | 4 - 14 gallons/hr |

**Access requirements** - heavy equipment, light vehicular, barge, or landing craft.

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## 2. 7 INCIDENT ACTION PLAN FORMS

The most current electronic copies of ICS forms can be found on the Tesoro website (goTSO), under Departments, Environmental, Health and Safety, Contingency Planning and Response, ICS forms. These forms are updated periodically by the Corporate Contingency Planning and Emergency Response Department.
This section contains the following forms that are necessary at the onset of an emergency.

- ICS 201 Incident Briefing
- ICS 202 Incident Objectives
- ICS 211p Check-In List (Personnel)
- ICS 213 General Message Log
- ICS 214 Unit Log

**THIS PAGE INTENTIONALLY LEFT BLANK.**

| 1. Incident Name | 2. Prepared by (Name)<br>Date: Time: | INCIDENT BRIEFING<br>ICS 201-1 |
|---|---|---|

**3. Map / Sketch** (Include maps drawn here or attached, showing the total area of operations, the incident site/area, overflight results, trajectories, impacted shorelines, or other graphics depicting situational and response status)

| 1. Incident Name | 2. Prepared By (Name)<br>Date: Time: | INCIDENT BRIEFING<br>ICS 201-2 |
|---|---|---|
| 4. Initial Incident Objectives | | |
| 5. Summary of Current Actions | | |

| Time | Action / Note |
|---|---|
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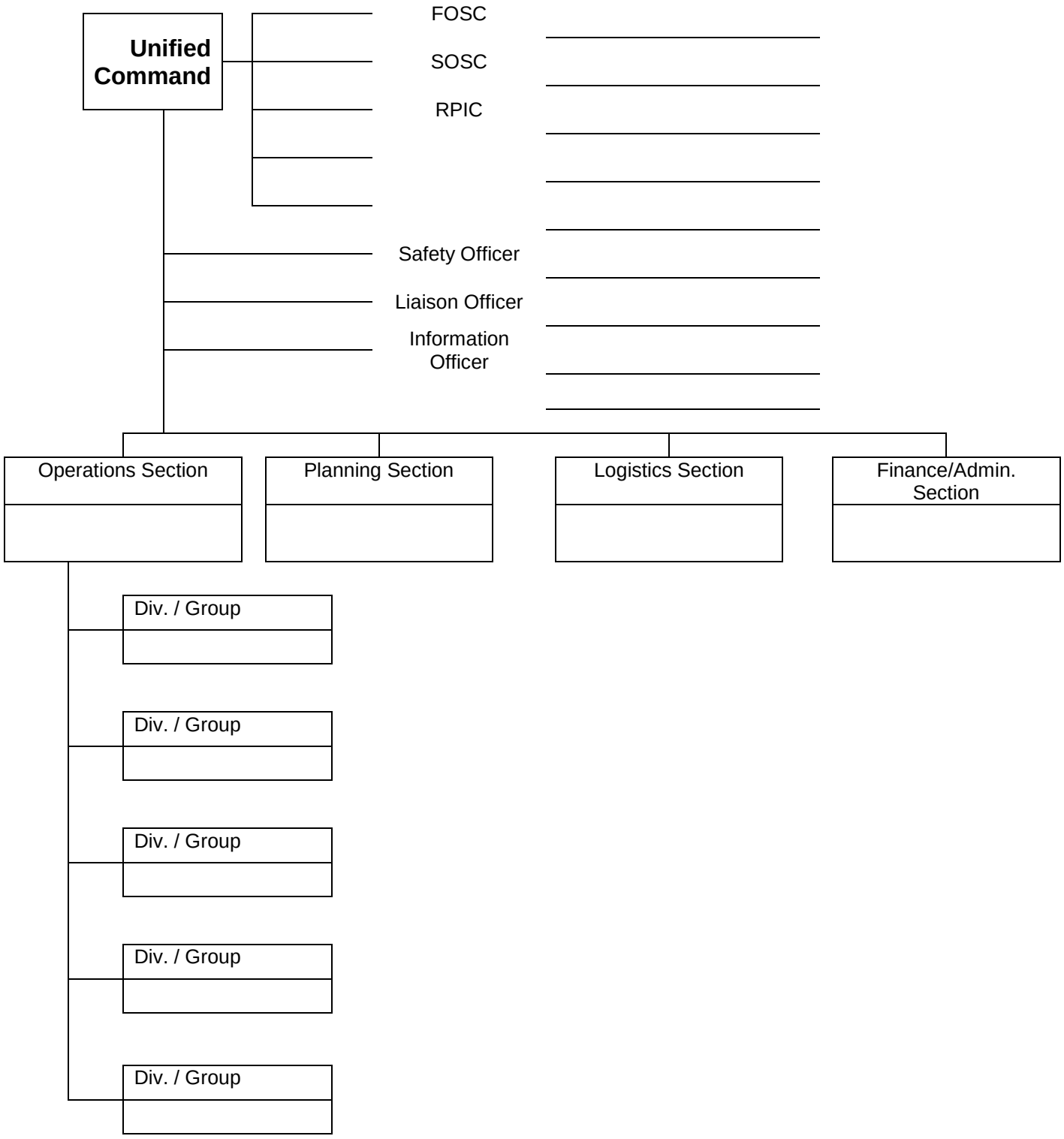
| 1. Incident Name | 2. Prepared By (Name)<br>Date: Time: | INCIDENT BRIEFING<br>ICS 201-3 |
|---|---|---|

**6. Current Organization**



| 1. Incident Name | 2. Prepared By (Name)<br>Date: Time: | INCIDENT BRIEFING<br>ICS 201-4 |
|---|---|---|

**7. Resources Summary**

| Resources Needed | Time Ordered | Resource Identifier | ETA | On Scene | Notes: (Location / Assignment/Status) |
|---|---|---|---|---|---|
| | | | | ☐ | |
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TESORO

| 1. Incident Name | 2. Operational Period (Date / Time)<br>From: To: | **INCIDENT OBJECTIVES**<br>**ICS 202** |
|---|---|---|

3. Overall Incident Objectives

4. Objectives for specified Operational Period

5. Safety Message for specified Operational Period

- ☐ **Review all safety messages prior to start of work**
- ☐ **Avoid slips, trips, and falls**
- ☐ **Observe special requirements for PPE**
- ☐ **Work on/or near water--Observe the buddy system**
- ☐ **Work on/or near water--Requires PFD to be worn**
- ☐ **Observe specific precautions during night operations**
- ☐
- ☐
- ☐

**6. Prepared by (Planning Section Chief)** **Date / Time**

**7. Approved by:** _____**FOSC** _____**SOSC** _____**LOSC** _____**TOSC** _____**RPIC**

| . Incident Name | 2. Operational Period<br>From: To: | 3.Check-in Location<br>☐ Command Post ☐ Other<br>☐ Staging Area | CHECK-IN LIST (Personnel)<br>ICS 211p |
|---|---|---|---|

| 4. Personnel Check-In Information | | | | 8. Initial Incident Check-in? √ | 9. Time | |
|---|---|---|---|---|---|---|
| 4. Name | 5. Company / Agency | 6. ICS Section / Assignment / Quals. | 7. Contact #s | ☐ | In | Out |
| | | | | ☐ | | |
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| 10. Prepared by | Date/Time | 11. Date / Time Sent to Resource Unit |
|---|---|---|

| 1. Incident Name | **GENERAL MESSAGE**<br>**ICS 213** |
|---|---|

2. TO:

| | | | | |
|---|---|---|---|---|
| ☐ **IC/UC**_____ | ☐ **OSC**_____ | ☐ **SUL**_____ | ☐ **CUL**_____ | ☐ **Other:** |
| ☐ **SO**_____ | ☐ **PSC**_____ | ☐ **RUL**_____ | ☐ **MUL**_____ | _____ |
| ☐ **PIO**_____ | ☐ **LSC**_____ | ☐ **EUL**_____ | ☐ **Air Ops.**_____ | _____ |
| ☐ **LO**_____ | ☐ **FSC**_____ | ☐ **DUL**_____ | ☐ **Wildlife**_____ | _____ |
| ☐ **Legal**_____ | | | | |

| 3. FROM: | ICS POSITION: |
|---|---|

**4. SUBJECT:**

5. MESSAGE:

RESPONSE REQUESTED: ☐YES ☐ NO RESPONSE REQUESTED BY (Date/Time):_____/_____

| 6. Signature / Position (message originator) | **Date / Time of Message** |
|---|---|

7. REPLY:

| 8. Signature / Position (person replying) | **Date / Time of Reply** |
|---|---|

| 1. Incident Name | 2. Operational Period (Date / Time)<br>From: To: | **UNIT LOG**<br>**ICS 214** |
|---|---|---|

| 3. Unit Name / Designators | 4. Unit Leader (Name & ICS Position) |
|---|---|

5. Personnel Roster Assigned

| NAME | ICS POSITION | HOME BASE |
|---|---|---|
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6. ACTIVITY LOG (CONTINUE ON FORM ICS 214-1)

| TIME | MAJOR EVENTS |
|---|---|
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| 7. Prepared By: | Date / Time |
|---|---|

# APPENDIX A

## HEALTH AND SAFETY PLAN

# SITE HEALTH AND SAFETY PLAN

## A. SITE DESCRIPTION

**Location** _____ **Date** _____
**Hazards** _____
**Area Affected** _____
_____
**Surrounding Population** _____
**Topography** _____
**Weather Conditions** _____
_____

## B. ENTRY OBJECTIVE

**The objective of the initial entry to the contaminated area is to:**

_____
_____

## C. OFFSITE ORGANIZATION AND COORDINATION

**(SEE TESORO INCIDENT COMMAND CHART)**
The following personnel are designated to carry out the stated job functions on site.
(Note: One person may carry out more than one job function.)

**TASK FORCE LEADER** _____

**SITE SAFETY OFFICER** _____

**SECURITY OFFICER** _____

**FEDERAL AGENCY REPS** _____
_____
_____

**STATE AGENCY REPS** _____
_____
_____

**LOCAL AGENCY REPS** _____
_____
_____

**CONTRACTORS** _____
_____

**All personnel arriving or departing the site should log in and out with the Site Security Guard. All activities on site must be cleared through the Project Team Leader.**

## D. OFFSITE CONTROL

_____ has been designated to coordinate access control and security on site. Safe perimeter has been established at _____ _____. No unauthorized person should be within this area.

The onsite Command Post and staging area have been established at _____ _____ _____.

The prevailing wind conditions are _____. This location is upwind from the Exclusion Zone.

Control boundaries have been established, and the Exclusion Zone (the contaminated area), hotline, Contamination Reduction Zone, and Support Zone (clean area) have been identified and designated as follows: _____ _____ _____ _____

These boundaries are identified by _____ _____.

## E. HAZARD EVALUATION

The following substance(s) are known or suspected to be on site. The primary hazards of each are identified.

| Substances Involved | Concentrations (if known) | Primary Hazards |
|---|---|---|
| | | |
| | | |
| | | |

The following additional hazards are expected on site:_____ _____ _____

**Hazardous substance information form(s) for the involved substance(s) have been completed and are attached**.

## F. PERSONAL PROTECTIVE EQUIPMENT

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks:

| Location | Job Function | Level of Protection |
|---|---|---|
| **Hot Zone** | | **A B C D Other** |
| **Decontamination Area** | | **A B C D Other** |

Specific protective equipment for each level of protection is as follows:

| LEVEL A | LEVEL B | LEVEL C | LEVEL D | OTHER |
|---|---|---|---|---|
| | | | | |
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| | | | | |

If air-purifying respirators are authorized, _____ is the appropriate canister for use with the involved substances and concentrations. A competent individual has determined that all criteria for using this type of respiratory protection have been met.

**NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE APPROVAL OF THE SITE SAFETY OFFICER AND THE PROJECT TEAM LEADER.**

## G. ON SITE WORK PLANS

Work party(s) consisting of _____ persons will perform the following task:

Project Team Leader_____
Work Party #1 _____
Work Party #2 _____
Rescue Team (required for IDLH entry) _____
Decontamination Team _____

The work parties were briefed on the contents of this plan at _____

## H. COMMUNICATION PROCEDURES

Channel ____ has been designated as the radio frequency for personnel in the **HOT ZONE.** All other onsite communications will use Channel _____.

Personnel in the **HOT ZONE** should remain in constant radio communication or within sight of the Project Team Leader. Any failure of radio communication requires an evaluation of whether personnel should leave the **HOT ZONE**.

_____ is the emergency signal to indicate that all personnel should leave the **HOT ZONE**. In addition, a loud hauler is available if required.

The following standard hand signals will be used in case of failure of radio communications:

| | |
|---|---|
| Hand gripping throat | Out of air – can't breathe |
| Grip partner's wrist or both hands around waist | Leave area immediately |
| Hands on top of head | Need Assistance |
| Thumbs up | I am alright, I understand |
| Thumbs down | Negative |

Telephone communication to the Command Post should be established as soon as practical. The phone number at the Command Post is _____.

## I. DECONTAMINATION PROCEDURES

Personnel and equipment leaving the **HOT ZONE** shall be thoroughly decontaminated. The standard level _____ decontamination protocol shall be used with the following decontamination stations: (1)_____(2)
(3)_____(4)_____(5)
(6)_____(7)_____(8)
(9)_____(10)_____(Other)

Emergency decontamination will include the following stations:
_____
_____

The following decontamination equipment is required: _____
_____
_____
_____ will be used as the decontamination solution.

## J. SITE SAFETY AND HEALTH PLAN

1. **Site Safety Officer**

_____ is the Site Safety Officer and is directly responsible to the Project Team Leader for safety recommendations on site.

**2. Emergency Medical Care**

_____ and _____are the qualified EMTs on site. _____ at _____ located _____ minutes from this location.

_____ was contacted at _____ and briefed on the situation, the potential hazards, and the substances involved. A map of alternative routes to this facility is available at _____.

Local ambulance service is available from _____ at phone number _____. Their response time is _____ minutes. Whenever possible, arrangements should be made for on site standby.

First-aid equipment is available at the following locations:

| First Aid Equipment | Location |
|---|---|
| First Aid Kit | _____ |
| Emergency Eye Wash | _____ |
| Emergency Shower | _____ |

Emergency medical information for substances present:

| **Substance** | **Exposure Symptoms** | **First-Aid Instructions** |
|---|---|---|
| | | |
| | | |
| | | |

List of emergency phone numbers:

| **Agency/Facility** | **Phone/Contact** |
|---|---|
| **Police** | |
| **Fire** | |
| **Hospital** | |
| **Airport** | |
| **Public Health Advisor** | |

## 3. Personnel and Environmental Monitoring

The following environmental monitoring instruments shall be used on site at the specified intervals. (strike if not applicable)

Combustible Gas Indicator continuous/hourly/daily/other _____

O2 Monitor continuous/hourly/daily/other _____

Colorimetric Tubes continuous/hourly/daily/other _____

HNU/OVA continuous/hourly/daily/other _____

Other continuous/hourly/daily/other _____

## 4. Emergency Procedures

(should be modified as required for incident)

The following standard emergency procedures will be sued by onsite personnel. The Site Safety Officer shall be notified of any onsite emergencies and be responsible for ensuring that the appropriate procedures are followed.

**Personnel Injury in the HOT ZONE:**

Upon notification of an injury in the HOT ZONE, the designated emergency signal _____ shall be sounded. All site personnel shall assemble at the decontamination line. The rescue team will enter the HOT ZONE (if required) to remove the injured person to the hotline. The Site Safety Officer and Project Team Leader should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement to the Support Zone. The onsite EMT shall initiate the appropriate first aid, and contact should be made for an ambulance and with the designated medical facility (if required). No persons shall reenter the HOT ZONE until the cause of the injury or symptoms is determined.

**Personnel Injury in Support Zone:**

Upon notification of an injury in the support Zone, the Project Team Leader and Site Safety Officer will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of onsite personnel, operations may continue, with the onsite EMT initiating the appropriate first aid and necessary follow-up as stated above. If the injury increases the risk to others, the designated emergency signal _____ _____ shall be sounded and all site personnel shall move to the decontamination line for further instructions. Activities on site will stop until the added risk is removed or minimized.

**Fire/Explosion:**

Upon notification of fire or explosion on site, the designated emergency signal _____ shall be sounded and all site personnel shall assemble at the decontamination line. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

**Personal Protective Equipment Failure:**

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and his/her buddy shall immediately leave the HOT ZONE. Reentry shall not be permitted until the equipment has been repaired or replaced.

**Other Equipment Failure:**

If any other equipment on site fails to operate properly, the Project Team Leader and Site Safety Officer shall be notified and then determine the effect of this failure on continuing operations on site. If the failure affects the safety or personnel or prevents completion of the work plan tasks, all personnel shall leave the HOT ZONE until the situation is evaluated an appropriate actions taken.

The following emergency escape routes are designated for use in those situations where egress from the HOT ZONE cannot occur through the decontamination line: _____
_____
_____.

In all situations, when an onsite emergency results in evacuation of the HOT ZONE, personnel shall not reenter until:

(1) The conditions resulting in the emergency have been corrected.
(2) The hazards have been reassessed.
(3) The Site Safety Plan has been reviewed.
(4) Site personnel have been briefed on any changes in the Site Safety Plan.

**5. <u>Personal Monitoring:</u>**

The following personal monitoring will be in effect on site: _____
_____
_____.

Personal exposure sampling: _____
_____.

Medical monitoring: The expected air temperature will be ____ F. If it is determined that heat stress monitoring is required (mandatory if over 70 F), the following procedures shall be followed:_____
_____
_____

**All site personnel have read the above plan and are familiar with its provisions.**

**Site Safety Officer** _____

**Project Team Leaader** _____

**Other Site Personnel** _____

# APPENDIX B

# WASTE DISPOSAL PLAN

# WASTE MANAGEMENT AND DISPOSAL PLAN

**Incident Name:**_____

**Date Prepared:**_____ **Time Prepared:**_____

**Location(s)/Division(s) Covered By Plan:**_____

_____

**ACP/Other References Consulted:** _____

## GENERAL INFORMATION

**Source Of Spill:**_____

**Total Amount Spilled:**_____

**Total Amount At Risk:**_____

**Type Of Material Spilled:**_____

## AGENCY INFORMATION

**Lead Agency:**_____

**Agency Representative(s):**_____

_____

**Telephone(s):**_____

**Comments:** _____

_____

_____

## VARIANCES

**Inquiry Made To Obtain Variances On:**_____

_____

**Individual(s) Contacted For Variances:** _____

_____

**Telephone(s):** _____

**Comments:** _____

_____

_____

## SAMPLES

**Media(s)/Date(s) Sampled:**_____

**Sample(s) Sent Via:**_____

**Laboratory Name(s):**_____

**SAMPLING/ANALYSIS PLAN(S) ATTACHED?** ☐ **YES** ☐ **NO**

**CHAIN OF CUSTODY FORM(S) ATTACHED?** ☐ **YES** ☐ **NO**

**Comments:** _____

## WASTE COVERED BY PLAN

### SOLIDS

| Type | Description(s) | Estimated Volume(s) |
|---|---|---|
| ☐ Oiled Natural Inorganic (Sand, Peebles, Etc.) | | |
| ☐ Oiled Natural Organic (Driftwood, Seaweed, Etc.) | | |
| ☐ Man-Made Materials (PPE, Sorbents, Etc.) | | |
| ☐ Unoiled Solids | | |
| ☐ Other(s) | | |

**Suspected Hazardous Waste?** ☐ **Yes** ☐ **No**

**Determination By Generator Knowledge?** ☐ **Yes** ☐ **No**

**Hazardous Waste Code(s):**_____

**Comments:**_____

## *LIQUIDS*

| Types | Description(s) | Estimated Volume(s) |
|---|---|---|
| ☐ Oil/Water Mixtures | _____ | _____ |
| | _____ | _____ |
| ☐ Uncontaminated Petroleum Products | _____ | _____ |
| | _____ | _____ |
| ☐ Waste Water | _____ | _____ |
| | _____ | _____ |
| ☐ Spent Solvents/ Dispersants/ Fuels | _____ | _____ |
| | _____ | _____ |
| ☐ Other(s) | _____ | _____ |
| | _____ | _____ |

**Suspected Hazardous Waste?** ☐ **Yes** ☐ **No**

**Determination By Generator Knowledge?** ☐ **Yes** ☐ **No**

**Hazardous Waste Code(s):**_____

**Comments:**_____

_____

_____

_____

## TEMPORARY WASTE STORAGE

**Estimated Storage Required (Roll Offs, Tanks, Etc.):**

| Storage Type | Estimated Capacity/Number Required |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

**Prefered Location(s):** _____

_____

_____

**Permit(s) Required For Temporary Storage:** _____

_____

_____

**Ground/Runoff Protection Required For Storage Area?** ☐ **Yes** ☐ **No**

**Liners/Cover Protection Required For Storage?** ☐ **Yes** ☐ **No**

**Comments:** _____

_____

_____

## WASTE TRANSPORTATION

**Proposed Transportation Method(s):**

| Waste Type/Description | Proposed Transport Method |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

**Permit(s)/License(s) Required For Transportation:**_____

**Liners/Cover Protection Required For Transportation?** ☐ **Yes** ☐ **No**

**Comments:**_____

## DISPOSAL METHOD(S)

| Method | Waste Type/Description | Available | Selected |
|---|---|---|---|
| Natural Degradation/ Dispersion | | ☐ | ☐ |
| Wastewater Treatment Plant | | ☐ | ☐ |
| Landfill | | ☐ | ☐ |
| Land Farms | | ☐ | ☐ |
| In Situ Burning | | ☐ | ☐ |
| Open Pit Burning | | ☐ | ☐ |
| Portable Incineration | | ☐ | ☐ |
| Process Incineration | | ☐ | ☐ |
| Reprocessing | | ☐ | ☐ |
| Reclaiming | | ☐ | ☐ |
| Recycling | | ☐ | ☐ |
| Well Injection | | ☐ | ☐ |
| Other | | ☐ | ☐ |

**Comments:** _____

## DISPOSAL RESOURCE(S)

**Proposed Resource(s) For Disposal Method(s) Selected (Landfill Operators, Incinerator Facilities, Etc.):**

| Disposal Method | Resource(s) |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

**Permit(s) Required For Disposal:**_____

**Comments:** _____

## HEALTH AND SAFETY PROCEDURES

_____

_____

_____

_____

_____

_____

_____

_____

**Health/Safety Plan Attached?** ☐ **Yes** ☐ **No**

**Comments:**_____

_____

_____

## ADDITIONAL COMMENTS

_____

_____

_____

_____

_____

_____

## CONTACTS AND APPROVALS

**Contact For Further Information:**_____

**Approved By:**_____ **Time/Date:**_____

# APPENDIX C

# NORTH DAKOTA CRUDE SYSTEM OPERATING AND MAINTENANCE PLAN

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## C.1 Operating and Maintenance Information

A copy of the Tesoro High Plains Pipeline Operating and Maintenance (O&M) Manual is located at the Crude Pipeline Office in Dickinson, ND. Information pertaining to operations and maintenance of the Crude Pipeline can be found in the manual.

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# APPENDIX D

# MATERIAL SAFETY DATA SHEETS

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## C.1 MSDS

OSHA Safety Data Sheets (SDS), also known as Material Safety Data Sheets (MSDS), for products within the THPP can be accessed through the Tesoro website at:
http://www.tsocorp.com/TSOCorp/SocialResponsibility/HealthandSafety/MSDS

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# APPENDIX E

# ENVIRONMENTALLY SENSITIVE AREAS

# Mandan to Tioga - 2012

## HCA Determination for Tesoro North Dakota Pipelines

KAM | Rev 2 | June 7, 2012

## HCA Data Preparation and Identification Process

### Pipeline Centerline Creation

To create the pipeline centerline, one must first create an attributed-arc pipeline centerline with linear referenced measures (stationing) in the ESRI GIS software. The basis for the pipeline centerlines came from a drawing submitted to GeoFields by Tesoro. Engineering stationing for the line was captured from submitted alignment sheets and the stationing was then assigned through linear referencing to the appropriate location on the line in the GIS.

Once constructed, the digital representation of the pipeline centerline was then subjected to a quality control process in ArcMap to ensure that the stationing has been correctly assigned. Part of the QC process ensures that the stationing increases in the correct direction down the line and that the maximum measure corresponds to the final cumulative stationing. Once the QC process has been completed on the calibrated centerline, the line is then loaded into the spatial database.

#### Pipeline and Station Series Tables

Once the centerline is loaded into the spatial database, the pipeline and station series information is loaded into the relational database. This finalizes the creation of the centerline. It is now a measured centerline with embedded stationing values (X, Y, and M) along with associated information about the pipeline (Pipeline Name, System, Operator, Product, Station Series, etc.)

### Building Relational Database

#### Data Capture from As-Builts

The features and events on the as-built alignment sheets submitted by Tesoro needed to be migrated to the database. The complete description of each feature or event (such as a valve, casing, or crossing) and the engineering station value of each event was captured from the alignment sheets and organized to be loaded to the relational database.

#### Data Loading into the Relational Database

Once a measured centerline has been created and data from the as-built sheets has been captured, facilities and events along the pipeline can be loaded based on the measure or stationing value. To add all of the relational information, we need to create a script to insert the data into the correct tables in the relational database. Once the information is loaded into the database, the engineering stationing obtained from the alignment sheets was used to calculate the cumulative measures.

Once these features were loaded into the database, a calibration of the centerline was performed based on the spatial location of the features on the line in conjunction with the measured value of the feature.

### Creating Spatial Layers

Once all the features are entered into the relational database, you can create spatial layers for the features based on the measured/stationed centerline and the corresponding relational tables.

## Creating HCA Layers

The goal in this section is to use the published HCAs to determine the HCA areas along the pipeline. One must use a process to derive engineering stationing ranges of the pipeline that intersect the areas. The pipeline segments that intersect the published HCAs become HCA segments of pipe.

Table 1 shows the published HCAs layers that were used for the analysis and the sources for each layer.

Table 1:

| HCA Layer | Source |
|---|---|
| Ecological | Requested by Tesoro from National Pipeline Mapping System |
| Drinking Water | Requested by Tesoro from National Pipeline Mapping System |
| Other Population | National Pipeline Mapping System |
| High Population | National Pipeline Mapping System |
| Commercially Navigable Waterways | National Pipeline Mapping System |

There are three types of impact that a pipeline can have on the published HCAs. Direct, Indirect and Potential. Figure 1 describes Direct, Figure 2 describes Indirect, and Figure 3 describes Potential.

Figure 1:

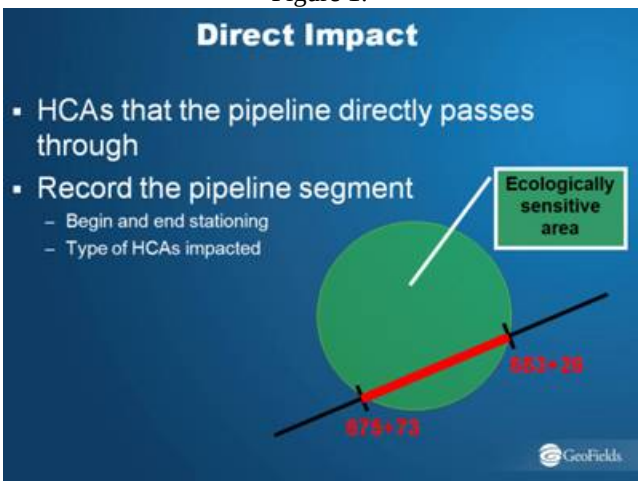



Figure 2:

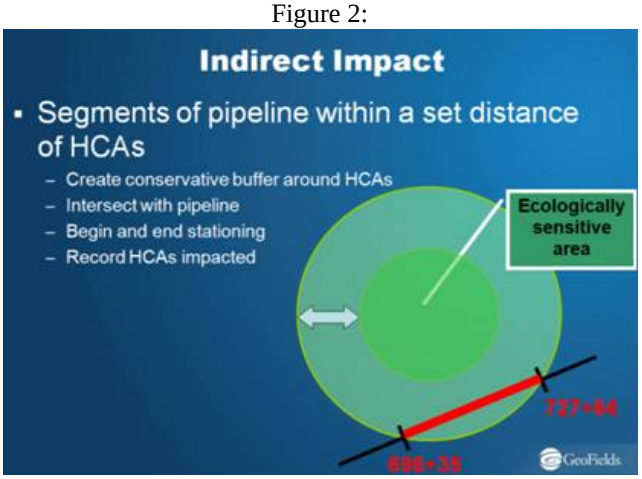
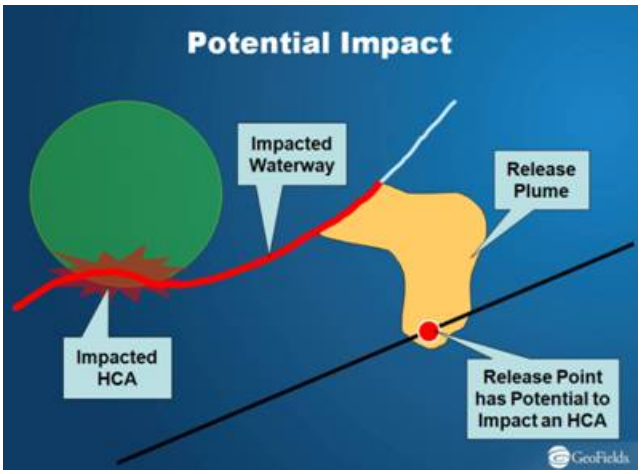



Figure 3:




The intersection of the pipeline centerline and the published HCA layers is then computed to obtain the HCA segments along the pipeline for each HCA layer type and each impact type (Direct, Indirect, and Potential). Results are reported in an event table with clearly reported cumulative stationing ranges for each segment of the line that intersects any HCA layer. Also reported in this table is the nature of the HCA layer that is impacted, for example, whether the HCA segment is caused by proximity to or intersection with a High Population Area or whether the line segment is classified as HCA due to intersection a Drinking Water area.

These results are presented below in Table 2a and Figure 4 for Mandan to Tioga.

(b) (7)(F)

[redacted]

Table 2a:

(b) (7)(F)

[redacted]

(b) (7)(F)

[redacted]

## Onshore

(b) (7)(F) [redacted]

| Pipe_ID | PipeSegmen Name | Distance (Miles) | HCA Type | Intersection Type |
|---|---|---|---|---|
| 600 | Ramberg to Keene | 8.42 | No HCA | No Impact |
| 600 | Tioga to Ramberg | 4.59 | No HCA | No Impact |

Table 2b:

## Offshore

| Pipe_ID | PipeSegment Name | Beginning Longitude | Beginning Latitude | End Longitude | End Latitude | Distance (Miles) | HCA Type | Intersection Type |
|---|---|---|---|---|---|---|---|---|
| 600 | Dunn Center to Mandan | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 600 | Keene to Dunn Center | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 600 | Ramberg to Keene | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 600 | Tioga to Ramberg | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

The information in the event Table 2a is then entered into the relational database for all found HCA segments of pipe. After this relational information is entered, a stored procedure is run to compute the engineering stations for all found HCA segments of pipeline.

Once the HCA tables in the relational database have both engineering and cumulative stationing entered, spatial layers can be generated. This allows for the creation of maps. Note that the stored HCA segment data can also be used to feed other analyses such as risk modeling, if that is desired.

## Summary of the Analysis

(b) (7)(F) [redacted] mile buffer of the pipeline. The map in Figure 4 also shows potential contact with Ecological areas. There is no Offshore HCA Impact for this pipeline.

# Alexander to Keene, Cartwright Extension and Sidney to Cartwright - 2011

GeoFields

## HCA Determination for Tesoro North Dakota Pipelines

KAM | Rev 2 | Sept. 29, 2011

## HCA Data Preparation and Identification Process

### Pipeline Centerline Creation

To create the pipeline centerline, one must first create an attributed-arc pipeline centerline with linear referenced measures (stationing) in the ESRI GIS software. The basis for the pipeline centerlines came from a drawing submitted to GeoFields by Tesoro. Engineering stationing for the line was captured from submitted alignment sheets and the stationing was then assigned through linear referencing to the appropriate location on the line in the GIS.

Once constructed, the digital representation of the pipeline centerline was then subjected to a quality control process in ArcMap to ensure that the stationing has been correctly assigned. Part of the QC process ensures that the stationing increases in the correct direction down the line and that the maximum measure corresponds to the final cumulative stationing. Once the QC process has been completed on the calibrated centerline, the line is then loaded into the spatial database.

#### Pipeline and Station Series Tables

Once the centerline is loaded into the spatial database, the pipeline and station series information is loaded into the relational database. This finalizes the creation of the centerline. It is now a measured centerline with embedded stationing values (X, Y, and M) along with associated information about the pipeline (Pipeline Name, System, Operator, Product, Station Series, etc.)

### Building Relational Database

#### Data Capture from As-Builts

The features and events on the as-built alignment sheets submitted by Tesoro needed to be migrated to the database. The complete description of each feature or event (such as a valve, casing, or crossing) and the engineering station value of each event was captured from the alignment sheets and organized to be loaded to the relational database.

#### Data Loading into the Relational Database

Once a measured centerline has been created and data from the as-built sheets has been captured, facilities and events along the pipeline can be loaded based on the measure or stationing value. To add all of the relational information, we need to create a script to insert the data into the correct tables in the relational database. Once the information is loaded into the database, the engineering stationing obtained from the alignment sheets was used to calculate the cumulative measures.

Once these features were loaded into the database, a calibration of the centerline was performed based on the spatial location of the features on the line in conjunction with the measured value of the feature.

### Creating Spatial Layers

Once all the features are entered into the relational database, you can create spatial layers for the features based on the measured/stationed centerline and the corresponding relational tables.

## Creating HCA Layers

The goal in this section is to use the published HCAs to determine the HCA areas along the pipeline. One must use a process to derive engineering stationing ranges of the pipeline that intersect the areas. The pipeline segments that intersect the published HCAs become HCA segments of pipe.

Table 1 shows the published HCAs layers that were used for the analysis and the sources for each layer.

Table 1:

| HCA Layer | Source |
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| Other Population | National Pipeline Mapping System |
| High Population | National Pipeline Mapping System |
| Commercially Navigable Waterways | National Pipeline Mapping System |

There are three types of impact that a pipeline can have on the published HCAs. Direct, Indirect and Potential. Figure 1 describes Direct, Figure 2 describes Indirect, and Figure 3 describes Potential.

Figure 1:

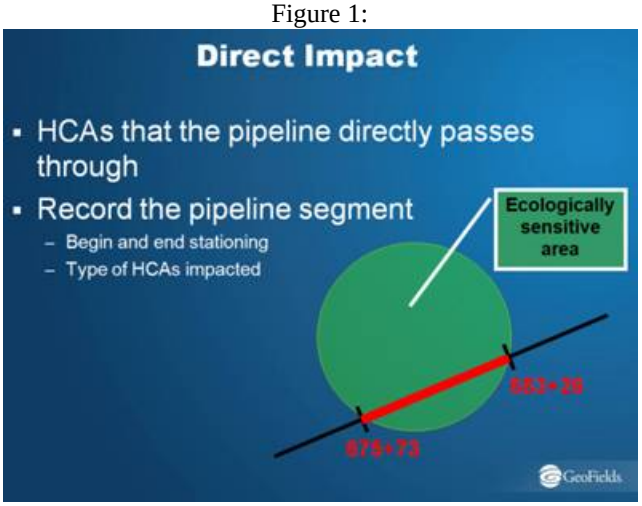



Figure 2:

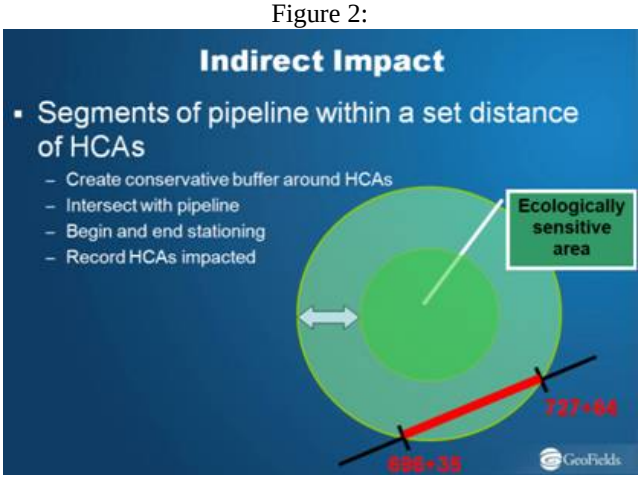
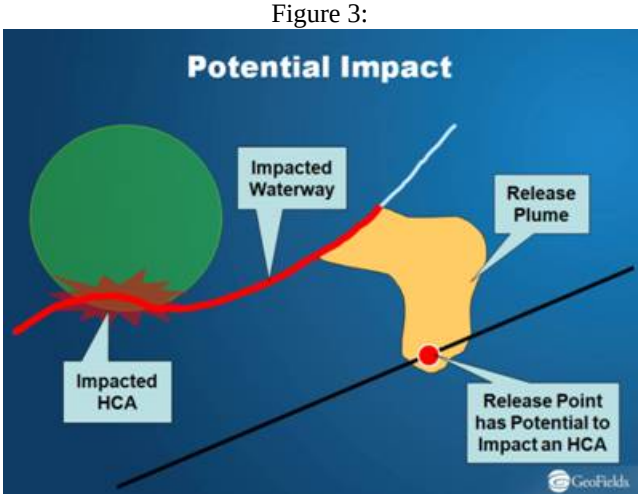


Figure 3:




The intersection of the pipeline centerline and the published HCA layers is then computed to obtain the HCA segments along the pipeline for each HCA layer type and each impact type (Direct, Indirect, and Potential). Results are reported in an event table with clearly reported cumulative stationing ranges for each segment of the line that intersects any HCA layer. Also reported in this table is the nature of the HCA layer that is impacted, for example, whether the HCA segment is caused by proximity to or intersection with a High Population Area or whether the line segment is classified as HCA due to intersection a Drinking Water area.

These results are presented below in Table 2 and Figure 4 for Alexander to Keene Pipeline.

(b) (7)(F)

[redacted]

Table 2:

(b) (7)(F)

[redacted]

These results are presented below in Table 3 and Figure 5 for Cartwright Extension Pipeline.

Figure 5:

(b) (7)(F)

[redacted]

Table 3:

These results are presented below in Table 4 and Figure 6 for Sidney to Cartwright Pipeline.

(b) (7)(F)

[redacted]

Table 4:

(b) (7)(F)

[redacted]

Little Knife to Dunn Center pipeline shown in Figure 8 does not intersect any HCA Segments.

(b) (7)(F)

[redacted]

Four Eyes to TreeTop pipeline shown in Figure 9 does not intersect any HCA Segments.

(b) (7)(F)

[redacted]

TreeTop to Fryburg pipeline shown in Figure 10 does not intersect any HCA Segments.

(b) (7)(F)

[redacted]

Once the HCA tables in the relational database have both engineering and cumulative stationing entered, spatial layers can be generated. This allows for the creation of maps. Note that the stored HCA segment data can also be used to feed other analyses such as risk modeling, if that is desired.

(b) (7)(F)

[redacted]

# PUTNAM TO SIDNEY TO POKER JIM - 2010

## HCA Determination for Tesoro North Dakota and Montana Pipelines

KAM | Rev 2 | Aug. 05, 2010

## HCA Data Preparation and Identification Process

### Pipeline Centerline Creation

To create the pipeline centerline, one must first create an attributed-arc pipeline centerline with linear referenced measures (stationing) in the ESRI GIS software. The basis for the pipeline centerlines came from a drawing submitted to GeoFields by Tesoro. Engineering stationing for the line was captured from submitted alignment sheets and the stationing was then assigned through linear referencing to the appropriate location on the line in the GIS.

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### Building Relational Database

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#### Data Loading into the Relational Database

Once a measured centerline has been created and data from the as-built sheets has been captured, facilities and events along the pipeline can be loaded based on the measure or stationing value. To add all of the relational information, we need to create a script to insert the data into the correct tables in the relational database. Once the information is loaded into the database, the engineering stationing obtained from the alignment sheets was used to calculate the cumulative measures.

Once these features were loaded into the database, a calibration of the centerline was performed based on the spatial location of the features on the line in conjunction with the measured value of the feature.

## Creating Spatial Layers

Once all the features are entered into the relational database, you can create spatial layers for the features based on the measured/stationed centerline and the corresponding relational tables.

## Creating HCA Layers

The goal in this section is to use the published HCAs to determine the HCA areas along the pipeline. One must use a process to derive engineering stationing ranges of the pipeline that intersect the areas. The pipeline segments that intersect the published HCAs become HCA segments of pipe.

Table 1 shows the published HCAs layers that were used for the analysis and the sources for each layer.

Table 1:

| HCA Layer | Source |
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| Drinking Water | Requested by Tesoro from National Pipeline Mapping System |

There are three types of impact that a pipeline can have on the published HCAs. Direct, Indirect and Potential. Figure 1 describes Direct, Figure 2 describes Indirect, and Figure 3 describes Potential.

Figure 1:

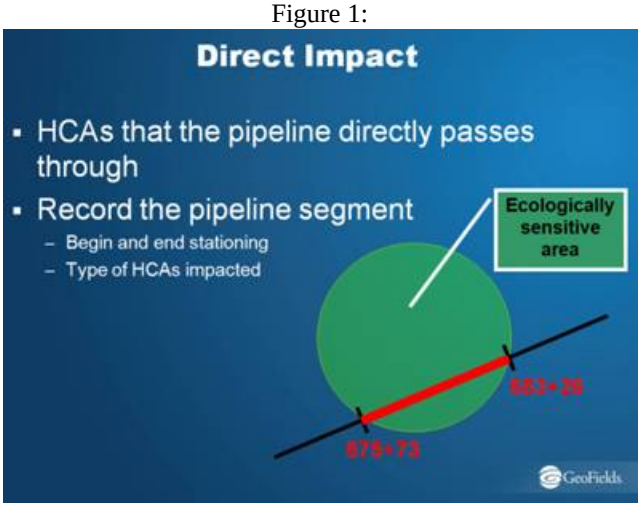



Figure 2:

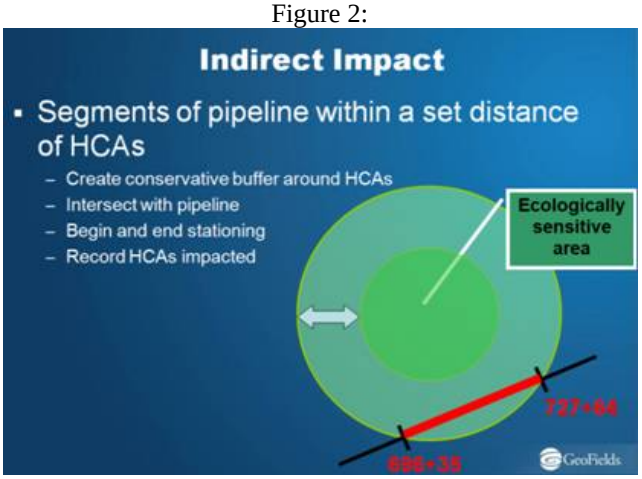
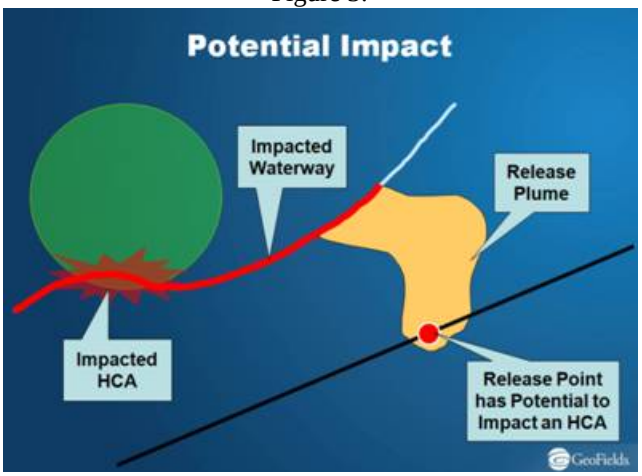


Figure 3:




The intersection of the pipeline centerline and the published HCA layers is then computed to obtain the HCA segments along the pipeline for each HCA layer type and each impact type (Direct, Indirect, and Potential). Results are reported in an event table with clearly reported cumulative stationing ranges for each segment of the line that intersects any HCA layer. Also reported in this table is the nature of the HCA layer that is impacted, for example, whether the HCA segment is caused by proximity to or intersection with a High Population Area or whether the line segment is classified as HCA due to intersection a Drinking Water area.

These results are presented below in Table 2 and Figure 4 for Putnam to Sidney Pipeline.

Figure 4:

(b) (7)(F)

[redacted]

(b) (7)(F)

[redacted]

These results are presented below in Table 3 and Figure 5 for Sidney to Poker Jim Pipeline.

(b) (7)(F)

[redacted]

(b) (7)(F)

[redacted]

The information in the event tables (Tables 2 and 3) is then entered into the relational database for all found HCA segments of pipe. After this relational information is entered, a stored procedure is run to compute the engineering stations for all found HCA segments of pipeline.

Once the HCA tables in the relational database have both engineering and cumulative stationing entered, spatial layers can be generated. This allows for the creation of maps. Note that the stored HCA segment data can also be used to feed other analyses such as risk modeling, if that is desired.

(b) (7)(F)

[redacted]