HAWAIIAN ELECTRIC COMPANY

FACILITY SPILL RESPONSE PLAN

Kahe Generating Station and Kahe Pipeline

Prepared by:

ENTRIX, INC.
590 Ygnacio Valley Road, Suite 200
Walnut Creek, California

Project Number 386829

August 2001

Revised by HECO Environmental Department
May 2012

THIS PAGE INTENTIONALLY LEFT BLANK

INTRODUCTION
TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

STATEMENT OF CORPORATE COMMITMENT

FACILITY SPILL RESPONSE PLAN
HAWAIIAN ELECTRIC COMPANY, INC.
KAHE GENERATING STATION
KAHE PIPELINE

This Facility Spill Response Plan (FSRP) has been prepared for operation of the Kahe Generating Station and Kahe Pipeline. This 658-megawatt power plant stores bulk oil as fuel for the six generating units. The associated Kahe Pipeline is used to supply fuel to the power plant. Products stored at the power plant include low sulfur fuel oil (LSFO), diesel fuel and lube oils. The pipeline transports LSFO and diesel oil. The total oil storage capacity at the Kahe Generating Station is (b) (7)(F), (b) (3) [redacted]

MANAGEMENT APPROVAL AND MANPOWER AUTHORIZATION

The necessary resources to implement this FSRP are hereby committed. In the event of an oil spill for which HECO is responsible, best efforts will be initiated to expeditiously control and remove any harmful quantity of oil discharged.

5/23/2012
Date

Ronald R. Cox, Vice President, Power Supply
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840-0001

THIS PAGE INTENTIONALLY LEFT BLANK

INTRODUCTION

Purpose and Scope

This Facility Spill Response Plan (FSRP) has been prepared for the Hawaiian Electric Company (HECO) Kahe Generating Station and Kahe Pipeline to satisfy federal oil spill planning requirements of the Environmental Protection Agency (EPA) and the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) established by the Oil Pollution Act of 1990 (OPA 90). Cross references to agencies which may have spill response planning jurisdiction over this facility are included at the end of this section.

The purpose of this FSRP is to provide a plan that, when implemented, is capable of protecting the natural resources of Hawaii. The FSRP is designed to illustrate HECO's capability to ensure prompt and proper removal of oil and to minimize environmental damages.

The FSRP has been prepared so that procedures established by this plan are in compliance with federal, state, and local oil spill contingency plans which establish criteria and guidelines for the response to an oil spill. It is intended to be used in conjunction with the Hawaiian Area Contingency Plan (HACP) and the associated Geographic Annex.

(b) (7)(F), (b) (3) [redacted]

The geographical area covered by this FSRP includes the Pacific Ocean west of the facility and adjacent shoreline which could be affected by a spill from the facility. The general geographical area is illustrated in Figure 1.

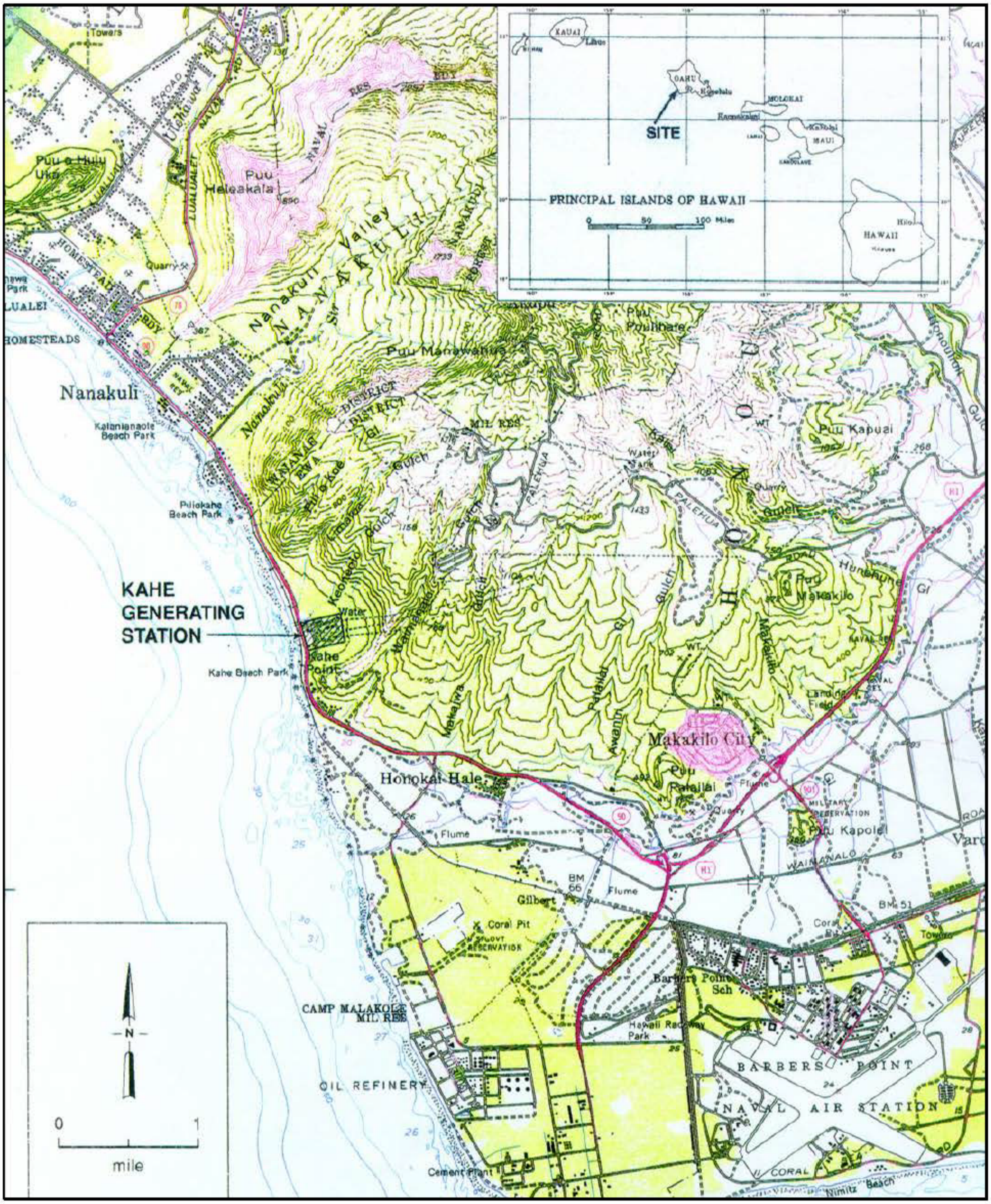
This FSRP consists of three parts:

1. The Emergency Response Action Plan (ERAP) 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. The Response Management Plan describes procedures to be used in protection and cleanup, and provides the forms for completion of the Incident Action Plan.

3. The Supplemental Information section includes a description of the facility and its response command structure, as well as environmental data and response equipment considerations. Sources and potential volumes of spills are identified using guidelines established by state and federal agencies.

Figure 1
Vicinity Map



A. Cover Page

Standard Response Cover Sheet (Page 1)

(HECO Kahe Generating Station - Kapolei, Hawaii)

General Information:

Owner/Operator of the Facility:
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840-0001
(808) 543-5673

Facility Name:
Kahe Generating Station

Facility Address:
92-200 Farrington Highway
Kapolei, Hawaii 96707

Facility Telephone Number:
(808) 543-4100

Latitude and Longitude:
(b) (7)(F), (b) (3) [redacted]

Dun & Bradstreet Number:
006926927

North American Industry Classification System (NAICS):
221112

Largest Oil Storage Tank Capacity:
(b) (7)(F), (b) (3) [redacted]

Number of Storage Tanks:
17 in service
2 out of service

Worst-Case Oil Discharge Amount:
(b) (7)(F), (b) (3) [redacted]

Facility Distance to Navigable Water:
0 – ¼-mile

Standard Response Cover Sheet (Page 2)
(HECO Kahe Generating Station - Kapolei, Hawaii)

Applicability of Substantial Harm Criteria:

Does the facility transfer oil over-water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

Yes ( ) No (X)

Does the facility have a total storage capacity greater than or equal to 1 million gallons and, within any storage area, does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation?

Yes ( ) No (X)

Does the facility have a total storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in 40 CFR Part 112 Appendix C, or a comparable formula) such that a discharge from the facility could cause injury to fish, wildlife and/or sensitive environments?

Yes (X) No ( )

Does the facility have a total storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Appendix C, or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?

Yes ( ) No (X)

Does the facility have a total storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater to or equal to 10,000 gallons within the last five years?

Yes ( ) No (X)

Standard Response Cover Sheet (Page 3)
(HECO Kahe Generating Station - Kapolei, Hawaii)

Certification:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining information, I believe that the submitted information is true, accurate, and complete.

Signature: Lawrence Ornellas
Lawrence Ornellas, Generation Department Manager

Date: May 21, 2012

B. Cross Reference - EPA Planning Requirements

U.S. EPA 40 CFR Part 112 Cross Reference
Section 112.20(h)
Section 112.21
Appendix F

EPA Reference 40 CFR Part 112 Appendix F	Description	HECO Plan Section
112.20(h)(1)	***Emergency Response Action Plan***	Part I
112.20(h)(1)(i)	The identity and telephone number(s) of a qualified individual(s).	1.2, 1.5
112.20(h)(1)(ii)	The identity of individuals or organizations to be contacted in the event of a discharge.	1.2 Table 1.2-2
112.20(h)(1)(iii)	A description of information to pass to response personnel in the event of a reportable spill.	1.2 Table 1.2-2
112.20(h)(1)(iv)	A description of the facility's response equipment and its location.	Figure 3.1-4
112.20(h)(1)(v)	A description of response personnel capabilities.	1.5.1
112.20(h)(1)(vi)	Plans for evacuation of the Facility and a reference to community evacuation plans, as appropriate.	1.3.3
112.20(h)(1)(vii)	A description of immediate measures to secure the source of the discharge, and to provide adequate containment and drainage of spilled oil.	1.1
112.20(h)(1)(viii)	A diagram of the facility.	Figure 1.3-1
112.20(h)(2)	***Facility Information*** Location and type of facility. Identity and tenure of the present owner/operator. Identity of the qualified individual.	Intro (A), 3.1
112.20(h)(3)	***Emergency Response Information***	
112.20(h)(3)(i)	The Identity of private personnel and equipment.	3.6

EPA Reference 40 CFR Part 112 Appendix F	Description	HECO Plan Section
112.20(h)(3)(ii)	Evidence of contracts or other approved means for ensuring the availability of such personnel and equipment.	3.6
112.20(h)(3)(iii)	The identity and the telephone number(s) of individuals or organizations to be contacted in the event of a discharge.	1.2 Table 1.2-2
112.20(h)(3)(iv)	A description of information to pass to response personnel.	1.2, Table 1.2-2
112.20(h)(3)(v)	A description of response personnel capabilities including: 1. duties of persons at the Facility during a response action, 2. response times and qualifications.	1.5.1, 1.5.2, 3.3.2
112.20(h)(3)(vi)	A description of the facility's response equipment including: 1. location of the equipment, 2. equipment testing.	Figure 3.1-4, 3.5
112.20(h)(3)(vii)	Plans for evacuation of the Facility and a reference to community evacuation plans, as appropriate.	1.3.1
112.20(h)(3)(viii)	A diagram of evacuation routes	Figure 1.3-1
112.20(h)(ix)	A description of the duties of the qualified individual that include: (A) activate internal alarms and hazard communication systems, (B) notify all response personnel, as needed, (C) identify the character, exact source, amount and extent of release, (D) notify and provide necessary information to the appropriate Federal, State, and local authorities, (E) assess the interaction of the spilled substance with water and/or other substances stored at the Facility,	3.3.1

EPA Reference 40 CFR Part 112 Appendix F	Description	HECO Plan Section
	(F) assess the possible hazards to human health and environment, (G) assess and implement prompt removal actions, (H) coordinate rescue and response actions, (I) use authority to immediately access company funding, (J) direct cleanup activities until properly relieved.	3.3.1
112.20(h)(4)	***Hazard Evaluation*** Identifiable history of discharges reportable under 40 CFR Part 110 for the entire life of the facility. Identify areas within the facility where discharges could occur. What the potential effects would be on the affected environment.	3.2
112.20(h)(5)	***Response Planning Levels***	3.8
112.20(h)(5)(i)	A worst case discharge, as calculated using the appropriate worksheet in Appendix D.	3.8.3
112.20(h)(5)(ii)	A discharge of 2,100 gallons or less provided this amount is less than the WCD amount.	3.8.1
112.20(h)(5)(iii)	A discharge greater than 2,100 gallons and less than or equal to 36,000 gallons or 10 percent of the capacity of the largest tank, whichever is less.	3.8.2
112.20(h)(6)	***Discharge Detection Systems*** Describe the procedures and equipment used to detect discharges.	3.1.5
112.20(h)(7)	***Plan Implementation***	1.1, 1.6
112.20(h)(7)(i)	Response actions to be carried out by facility personnel or contracted personnel.	1.1, 1.6, Part 2
112.20(h)(7)(ii)	A description of the equipment to be used for each scenario.	1.6, Part 2, 3.6

EPA Reference 40 CFR Part 112 Appendix F	Description	HECO Plan Section
112.20(h)(7)(iii)	Plans to dispose of contaminated cleanup materials.	1.7, Appendix C
112.20(h)(7)(iv)	Measures to provide adequate containment and drainage of spilled oil.	3.1.2
112.20(h)(8)	Self-inspection, Training, and Meeting Logs	3.7
112.20(h)(8)(i)	A checklist and record of inspection for: 1. tanks, 2. secondary containment, 3. response equipment.	3.1.6
112.20(h)(8)(ii)	A description of the drill/exercise programs to be carried out under the response plan as described in Section 112.21.	3.7.2
112.20(h)(8)(iii)	A description of the training program to be carried out under the response plan as described in Section 112.21.	3.7.2
112.20(h)(8)(iv)	Logs of: 1. discharge prevention meetings, 2. training sessions, 3. drills/exercises.	3.7.2
112.20(h)(9)	Diagrams: 1. site plan 2. drainage plan.	1.3, 3.1
112.20(h)(10)	Security Systems The review plan shall include a description of facility security systems.	3.1.7
112.20(h)(11)	Response Plan Cover Sheet	Intro (A)
112.21(a)	Develop a training and drill program that satisfies the requirements of this section.	3.7

EPA Reference 40 CFR Part 112 Appendix F	Description	HECO Plan Section
112.21(b)	Develop a facility response training program to train personnel involved in response activities.	3.7.1
112.21(b)(1)	Proper instruction of facility personnel in the procedures to respond to discharges of oil and in applicable oil spill response laws, rules, and regulations.	3.7.1
112.21(b)(2)	Training shall be functional in nature according to job tasks for both supervisory and non-supervisory operational personnel.	3.7.1
112.21(b)(3)	Trainers shall develop specific lesson plan on subject areas relevant to facility personnel involved in oil spill response and cleanup.	3.7.1
112.21(c)	Develop a program of facility response drills/ exercises, including evaluation procedures.	3.7.2
Appendix F to Part 112-1.0	***Model Facility-Specific Response Plan***	
Appendix F-1.1	***Emergency Response Action Plan*** 1. Qualified Individual Information 2. Emergency Notification Phone List 3. Spill Response Notification Form 4. Response Equipment List and Location 5. Response Equipment Testing and Deployment 6. Facility Response Team 7. Evacuation Plan 8. Immediate Actions 9. Facility Diagram	 1.2, 1.5 1.2 1.2 Figure 3.1-4 1.5.2 1.5 1.3.1 1.1, 1.6 Figure 1.3-1
Appendix F-1.2	***Facility Information***	3.1
1.2.1	Facility Name and Location	Intro (A), 3.1
1.2.2	Latitude and Longitude	3.1

EPA Reference 40 CFR Part 112 Appendix F	Description	HECO Plan Section
1.2.3	Wellhead Protection Area	3.1
1.2.4	Owner/Operator	3.1
1.2.5	Qualified Individual(s)	1.2, 1.5, 3.3
1.2.6	Date of Oil Storage Start-up	3.1
1.2.7	Current Operation	3.1
1.2.8	Dates and Types of Substantial Expansion	3.1
Appendix F-1.3	***Emergency Response Information***	
1.3.1	Notification	1.2
1.3.2	Response Equipment List	3.5, 3.6
1.3.3	Response Equipment Testing/Deployment	3.1.6
1.3.4	Personnel	1.2, 1.5, 3.3
1.3.5	Evacuation Plans	1.3
1.3.6	Qualified Individual's Duties	3.3.1
Appendix F-1.4	***Hazard Evaluation***	
1.4.1	Hazard Identification	3.1, 3.2
1.4.2	Vulnerability Analysis	3.2
1.4.3	Analysis of the Potential for an Oil Spill	3.2
1.4.4	Facility Reportable Oil Spill History	3.2
Appendix F-1.5	***Discharge Scenarios***	
1.5.1	Small and Medium Discharges	3.8.1, 3.8.2
1.5.2	Worst Case Discharge	3.8.3
Appendix F-1.6	***Discharge Detection Systems***	
1.6.1	Discharge Detection by Personnel	3.1.5/3.1.6
1.6.2	Automated Discharge Detection	3.1.5/3.1.6
Appendix F-1.7	***Plan Implementation***	
1.7.1	Response Resources for Small, Medium, and Worst Case Spills	1.5, 3.5, 3.6

EPA Reference 40 CFR Part 112 Appendix F	Description	HECO Plan Section
1.7.2	Disposal Plans	1.7, Appendix C
1.7.3	Containment and Drainage Planning	3.1.3
Appendix F-1.8	***Self-Inspection, Drills/Exercises, and Response Training***	
1.8.1	Facility Self-Inspection	3.1.6
1.8.1.1	Tank Inspection	3.1.6
1.8.1.2	Response Equipment Inspection	3.1.6
1.8.1.3	Secondary Containment Inspection	3.1.6
1.8.2	Facility Drills/Exercises	3.7.2
1.8.2.1	Qualified Individual Notification Drill Log	Figure 3.7-1
1.8.2.2	Spill Management Team Tabletop Exercise Log	Figure 3.7-2
1.8.3	Response Training Log	Figure 3.7-3
1.8.3.1	Response Personnel Training Log	Figure 3.7-4
1.8.3.2	Discharge Prevention Meeting Log	3.7.1
Appendix F-1.9	***Diagrams*** 1. Site Plan Diagram 2. Site Drainage Plan Diagram 3. Site Evacuation Plan Diagram	1.3, 3.1
Appendix F-1.10	***Security***	3.1.7
Appendix F-2.0	***Response Plan Cover Sheet***	Intro (A)
Appendix F-3.0	***Acronyms***	Appendix F

C. Cross Reference – PHMSA Planning Requirements

PHMSA Reference 49 CFR Part 194	Description	FSRP Section
194.103	Significant and Substantial Harm	D.1
194.105	Worst Case Discharge	D.1, D.3
194.107	General Response Plan Requirements	
194.107 (a)	Resources for a Worst Case Discharge	3.5, 3.6, 3.8
194.107 (b)	Consistency with NCP and ACP	Introduction
194.107 (b)(1)	Consistency with NCP	Introduction
194.107 (b)(1)(i)	Operator's Function	1.2, 1.5, 3.3
194.107 (b)(1)(ii)	Site Safety	1.3, 1.6
194.107 (b)(1)(iii)	Permission for Alternative Response Strategies	1.6.8
194.107 (b)(2)(i)	Consistency with ACP	Introduction
194.107 (b)(2)(i)	Removal of WCD	D.3
194.107 (b)(2)(iii)	Sensitive Areas	1.6.6, 3.8
194.107 (b)(2)(iv)	Expedited Decision on Dispersant Use	1.6.8
194.107 (c)(1)	Core Plan	
194.107 (c)(1)(i)	Information Summary	D.1
194.107 (c)(1)(ii)	Immediate Notification Procedures	1.2, D.2
194.107 (c)(1)(iii)	Spill Detection and Mitigation	1.1, 1.6, 3.1, D.3
194.107 (c)(1)(iv)	Oil Spill Response Organization	1.5, 3.3
194.107 (c)(1)(v)	Response Activities and Resources	1.1, 1.6
194.107 (c)(1)(vi)	Federal, State and local Agencies	1.2
194.107 (c)(1)(vii)	Training	3.7
194.107 (c)(1)(viii)	Equipment Testing	3.5, 3.6
194.107 (c)(1)(ix)	Drills	3.7
194.107 (c)(1)(x)	Plan Review and Update	3.4

PHMSA Reference 49 CFR Part 194	Description	FSRP Section
194.107 (c)(2)	Response Zone Specific Information	D.1 {only one response zone see 194.107 (d)(1)}
194.107 (c)(3)	Response Management System	3.3
194.113	Information Summary	D.1
194.113 (a)	Core Plan	D.1
194.113 (a)(1)	Name and Address	D.1
194.113 (a)(2)	Description of Response Zone	D.1
194.113 (b)	Response Zone Appendix	(Single Response Zone)
194.113 (b)(1)	Core Plan Information Summary	D.1
194.113 (b)(2)	Qualified Individual	3.3.1
194.113 (b)(3)	Description of Response Zone	D.1
194.113 (b)(4)	List of Line Criteria	D.1, D.5
194.113 (b)(5)	Harm Criteria	D.1
194.113 (b)(6)	Type and Volume of Oil for WCD	D.1, D.3

PHMSA Reference 49 CFR Part 194 Appendix A	Description	FSRP Section
Section 1	Information Summary	D.1
Section 1 (a)	Core Plan	D.1
Section 1 (b)	Response Zone Appendix	D.1
Section 1 (c)	Certification	D.1.1
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, D.2.2
Section 2 (f)	Information to be provided	1.2
Section 3	Spill Detection and Mitigation	
Section 3 (a)	Initial Detection	1.1, 3.1, D.3
Section 3 (b)	Initial Procedures	1.1, 1.6
Section 3 (c)	List of Equipment	3.5, 3.6, HACP
Section 3 (d)	24-hr. Contacts for Equipment	1.2
Section 3 (e)	24-hr. Contacts for Personnel	1.2
Section 4	Response Activities	1.1, 1.6
Section 4 (a)	Responsibilities of Operating Personnel	1.1
Section 4 (b)	QI Responsibilities	1.1
Section 4 (c)	Coordination	1.1
Section 4 (d)	Response Resources	3.5, 3.6, HACP
Section 4 (e)	OSRO Equipment and Personnel	3.5, 3.6
Section 5	List of Contacts	
Section 5 (a)	Personnel	1.2
Section 5 (b)	QI	1.2

PHMSA Reference 49 CFR Part 194 Appendix A	Description	FSRP Section
Section 5 (c)	Insurance Representative	1.2
Section 5 (d)	Response Resources	1.2
Section 6	Training	3.7.1, 3.7.2
Section 7	Drill Procedures	3.7.3
Section 7 (a)	Announced and Unannounced	3.7.3
Section 7 (b)	Type of Drills	3.7.3
Section 7 (b)(1)	Manned Facility Notification	3.7.3
Section 7 (b)(2)	Unmanned Facility Notification	3.7.3
Section 7 (b)(3)	Table Top	3.7.3
Section 7 (b)(4)	Equipment Deployment	3.7.3
Section 7 (b)(5)	Entire Plan	3.7.3
Section 8	Plan Review and Update	3.4
Section 8 (a)	Procedures to meet 49CFR194.121	D.5.1
Section 8 (b)	Following a WCD	D.5.2
Section 9	Response Zone Appendix	
Section 9 (a)	QI	3.3.1
Section 9 (b)	Notification Procedures	1.2
Section 9 (c)	Spill Detection and Mitigation	1.1, 3.1, 1.6
Section 9 (d)	Response Resources	3.5, 3.6
Section 9 (e)	Response Actions	1.1, 1.6
Section 9 (f)	Agency Contacts	1.2
Section 9 (g)	Worst Case Discharge	D.3, D.4
Section 9 (h)	WCD Calculations	D.3
Section 9 (i)	Pipeline Drawing	D.6
Section 9 (j)	Pipeline Diagram	D.6
Section 9 (k)	Product Description	D.1

D. Record of Revisions

FACILITY SPILL RESPONSE PLAN
KAHE GENERATING STATION
KAHE PIPELINE

Revision Number	Revision Date	Date Entered	Signature of Person Entering Changes
01	July 29, 2002		
02	March 2007		
03	June 2005	6/16/05	Kirk Tomita
04	May 2007	5/21/07	Kirk Tomita
05	May 2012	5/21/12	Kirk Tomita

Distribution:

1. Kahe Generating Station – Shift Supervisor
2. Kahe Generating Station – Sr. Supervisor
3. Kahe Generating Station – Operations Superintendent
4. Kahe Generating Station – Environmental Compliance Supervisor
5. HECO Fuels Department
6. HECO Environmental Department (K. Tomita)
7. Clean Islands Council
8. Environmental Protection Agency – Region IX (electronic, 2 copies)
9. Pipeline and Hazardous Material Safety Administration (electronic, 2 copies)
10. Hawaiian Electric Company (Environmental File)

THIS PAGE INTENTIONALLY LEFT BLANK

PART I
EMERGENCY RESPONSE ACTION PLAN

HAWAIIAN ELECTRIC COMPANY, INC.
KAHE GENERATING STATION
KAHE PIPELINE
KAPOLEI, HAWAII

Submitted: May 2012

THIS PAGE INTENTIONALLY LEFT BLANK

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) and is arranged so that response actions are not delayed. Examples of emergency response activities include source control, assessment, emergency response organization, mobilization of response resources, and the protection of sensitive areas.

The Emergency Response Action Plan (ERAP) contains the elements required under the EPA's model Plan (40 CFR 112, Appendix F), but is formatted to be more user-friendly. A cross-reference to the specific requirements is provided in the Introduction Section.

THIS PAGE INTENTIONALLY LEFT BLANK

PART I
TABLE OF CONTENTS
EMERGENCY RESPONSE ACTION PLAN

1.1 EMERGENCY ACTION CHECKLISTS

This section provides a prioritized list of actions that should be taken by key members of the Immediate Response Team (IRT) in the event of an oil spill. These are the actions that occur during the first minutes of an incident and determine the extent of emergency response required.

Each action item has been carefully planned but may not completely address all situations and circumstances that might be encountered in an emergency situation. Careful evaluation, common sense, and experienced judgment should be applied at all times during an emergency response.

The Emergency Action Checklists in this section are presented as a guide. The lists are not intended to preclude logical actions and decisions based on the observed circumstances.

1.1.1 Emergency Action Checklist Format

The format of the Emergency Action Checklist is presented in three levels of detail. The action item is printed in **bold** type. A further explanation and detail of the action item follows the bold type. References to detailed material located in this FSRP and applicable to the specific task are also noted.

After all IRT duties have been accomplished, or are in progress, the team members will continue the duties assigned to their respective position (Section 1.5, Spill Response Organization). Team members will be responsible for those duties until relieved. Team members should confirm the level of response required with the Incident Commander (IC) before proceeding with those duties.

In smaller incidents, an employee may be assigned the responsibilities of more than one position. If so, he/she should approach the combined duties in parallel with the most important duties (usually listed first) of both tasks receiving priority.

THIS PAGE INTENTIONALLY LEFT BLANK

Oil Spill

ANY PERSON DETECTING A SPILL OR THREAT OF A SPILL

❑ __________ **1. Discontinue Operations**
- Activate the emergency shutdown procedures.

❑ __________ **2. Warn People in the Area of Hazards**
- Direct employees and contract workers to move well clear of the release in a crosswind or upwind direction.
- Warn personnel to avoid breathing fumes.
- Warn personnel to avoid igniting fumes.
- Attend to injured personnel.

❑ __________ **3. Prevent Ignition**
- Exclude ignition sources from the area.
- Do not start electrical equipment or other engines in the area.

❑ __________ **4. Report the Situation**
- Notify the Shift Supervisor (see Section 1.2, *Notification*) as soon as possible and provide the following information:
  - The time of the incident.
  - The location of the incident.
  - Whether the incident caused any injury to personnel.
  - The type of oil spilled.
  - The amount of oil spilled.
  - The status of the source.

❑ __________ **5. Keep Clear of the Hazardous Area**
- Do not try to remedy the situation alone.
- Keep the spill area under surveillance until danger of fire or explosion has been eliminated.

UTILITY OPERATOR

❑ ___________ **1. Verify Safety of Personnel**

- Eliminate ignition source(s).

❑ ___________ **2. Assess the Situation**

- Source of release.
- General extent of release.
- Status of shutdown.
- Number of injured and their condition.
- Initial site monitoring: O_2, benzene and LEL.
- Probable direction of vapors.
- Estimate quantity of release (see Sections 1.6.1 and 1.6.2, Response Strategies).
- Wind and weather conditions.
- Direction of movement (see Section 1.6, Response Strategies).
- Status of ignition sources.

❑ ___________ **3. Notify Shift Supervisor of the Incident**

(see Section 1.2, *Notification*)

❑ ___________ **4. Stop Release**

- Stop the source of the release or verify that source is stopped.
- Shut off transfer pumps, close all header and tank valves, and drain remaining contents of hoses/pipelines back into tanks, if feasible.

❑ ___________ **5. Implement Site-Specific Response Strategy**

- Block storm drains and/or close Safe-Drain® valves. (see Section 1.6, *Response Strategies*)

❑ ___________ **6. Document All Actions**

SHIFT SUPERVISOR/INITIAL INCIDENT COMMANDER

❑ ________ **1. Receive Report of Spill**
- Ascertain nature and severity of spill.
- Ensure safety of onsite personnel.
- Assume role of incident commander.

❑ ________ **2. Notify Clean Islands Council and Fire Department**
- Initiate notifications as necessary.
  (see Section 1.2, *Notification*)

❑ ________ **3. Activate Immediate Response Team**
- Brief members of the Immediate Response Team on the status of the incident.

❑ ________ **4. Notify HECO Spill Management Team**
(see Section 1.2, *Notification*)

❑ ________ **5. Initiate Required Government Agency Notifications**
(see Section 1.2, *Notification*)

❑ ________ **6. If Necessary, Direct Rescue of Injured and Evacuate Area**
(see Section 1.3.3, *Evacuation Plan*)
- Direct response personnel to don protective clothing, as appropriate, and remove injured to upwind area.
- Direct evacuation of employees and contract personnel to safe areas upwind from spill.
- Control ignition sources.

❑ ________ **7. Establish Command Center and Staging Areas**
(see Section 1.6.4, *Response Strategies*)

❑ ________ **8. Document All Actions**
- Submit reports as required.

SAFETY OFFICER

❑ ______ 1. **Evaluate Immediate Public Health and Safety Risks**

❑ ______ 2. **Recommend Site Control Measures to Isolate Public from Possible Exposure**

❑ ______ 3. **Assess Environmental Conditions**
- Air and water monitoring.

❑ ______ 4. **Recommend Immediate Actions to be Taken by Immediate Response Team to Protect Health and Safety**

❑ ______ 5. **Conduct Site Safety Evaluation**

❑ ______ 6. **Develop Site Safety Plan**
(see Appendix A, *Site Safety Plan*)

❑ ______ 7. **Document All Actions**

Fire and/or Explosion

SHIFT SUPERVISOR/INITIAL INCIDNET COMMANDER

❑ ____________ 1. **Assume Command**
- Upon acknowledgment of a fire or explosion at the facility, the Shift Supervisor or his representative will assume command and verify that all field personnel are safe and accounted for.

❑ ____________ 2. **Call 9-1-1**
- Call or direct an associate to dial 9-1-1, if not already contacted.

❑ ____________ 3. **Shutdown Fuel Source**
- Determine the fuel source to the fire or explosion and direct the shutdown of selected process trains if automatic shutdown has not occurred.

❑ ____________ 4. **Rescue or Evacuate Threatened Personnel**
- If required, provide rescue of injured personnel if safe to do so.

❑ ____________ 5. **Direct All Personnel by Radio, Overhead Loudspeaker System or Evacuation Alarm to Evacuate and Stay Clear of the Immediate Scene**

❑ ____________ 6. **Direct On-Site Safety to Verify Actions Taken are Safe**

❑ ____________ 7. **Notify or Alert Neighboring Operations**
- Notification is required if a significant incident occurs and it would potentially affect other operations in the area.

❑ ____________ 8. **Notify HECO Management of the Incident**

–**continued**–

SHIFT SUPERVISOR/INITIAL INCIDNET COMMANDER (Continued)

❑ ________ **9. Establish Command Post and Staging Area**

(see Section 1.6.4, *Response Strategies*)

- Declare that an emergency is in progress and define the location of the Command Post if different from Office.
- Declare a pre-determined location as the Staging Area for emergency response equipment and other equipment as needed.

❑ ________ **10. Meet and Brief Fire Department Officer**

- Meet and brief the first arriving Fire Department Officer of the fire and/or explosion and response actions taken so far.
- Make him/her aware of any special hazards or material at the fire scene.
- Identify yourself as the HECO IC and inform him/her of staging area, or ask him/her to establish one.

❑ ________ **11. Review the Status of the Incident**

- Review the status of the incident and the response taken.
- Consult with the local Police/Fire Department to determine if evacuation or an escalation of the response is needed.
- Verify the safety of Plant personnel.

❑ ________ **12. Form Unified Command**

- Form a Unified Command with public agencies as needed.
- Direct facility personnel to work with the Fire Department in any way possible to mitigate the emergency incident.

–**continued**–

SHIFT SUPERVISOR/INITIAL INCIDNET COMMANDER (Continued)

❑ ________

13. **Inspect the Facilities for Damage or Unsafe Conditions**
    - Direct personnel to inspect surrounding facilities for damage or unsafe conditions caused by the fire or explosion.
    - Verify they have the proper safety equipment and clothing before entering potentially dangerous areas.

❑ ________

14. **Review all Response Actions for Adequacy**
    - Review all response actions taken and determine if adequate personnel and equipment have been deployed to mitigate the emergency.
    - If flammable/combustible liquids are involved in the incident, verify run-off is controlled to prevent further damage.

❑ ________

15. **Document All Actions**
    - Submit reports as required.

WARNING

SUBSEQUENT EXPLOSIONS, COLLAPSE OF STRUCTURES AND RELEASE OF TOXIC VAPORS MAY OCCUR

TAKE APPROPRIATE ACTIONS

Fire and/or Explosion

SAFETY OFFICER

- ❑ ________ **1. Upon Notification of Fire or Explosion, Report to the Command Post to Receive Briefing on the Incident**
- ❑ ________ **2. Report to Incident Scene**
  - Upon assignment to the position of Safety Unit Leader, report to the incident scene and verify that all actions taken are being conducted in a safe manner.
- ❑ ________ **3. Report All Unsafe Conditions at the Incident Scene to the Incident Commander**
  - Take remedial actions as necessary.
- ❑ ________ **4. Verify All Involved Personnel Have Appropriate Personal Protective Equipment and Clothing**
- ❑ ________ **5. Prepare Initial Site Safety Plan**
  (see Appendix A, *Site Safety Plan*)
- ❑ ________ **6. Assist the Incident Commander and Others in Preparation of the Initial Incident Response Plan**
- ❑ ________ **7. Verify First Aid is Available**
- ❑ ________ **8. Verify Only Personnel Involved in Incident Mitigation are Allowed at the Scene**
- ❑ ________ **9. Document All Actions and Observations**

Tank Overfill/Failure

UTILITY OPERATOR

❑ ________ **1. Verify Safety of Personnel**

- Eliminate ignition source(s).

❑ ________ **2. Stop Release**

- Activate emergency shutdown.
- Stop the source of the release or verify that source is stopped.
- Notify the Control Room as appropriate.
- <u>Tank Overfill</u> - Shut off transfer pumps, close all header and tank valves, transfer product to available tankage to reduce level in overfilled tank.
- <u>Truck Tank/Valve Leak</u> - Shut down transfer and attempt to close valve or repair leak. Pump out any leaking tank compartments.
- <u>Tank Leak</u> - Attempt to plug leak and begin transferring tank contents to available tankage; repair tank.

❑ ________ **3. Assess the Situation**

- Source of release.
- General extent of release.
- Status of shutdown.
- Number of injured and their condition.
- Initial site monitoring: O_2, benzene and LEL.
- Probable direction of vapors.
- Estimated quantity of release (see Sections 1.6.1 and 1.6.2, *Response Strategies*).
- Wind and weather conditions.
- Direction of movement (see Section 1.6.3, *Response Strategies*).
- Status of ignition sources.

❑ ________ **4. Notify Shift Supervisor of the Incident**

–**continued**–

UTILITY OPERATOR (Continued)

❑ ________ 5. **Implement Site-Specific Response Strategy**

- Block storm drains and/or close Safe-Drain® valves. (see Section 1.6, *Response Strategies*)
- Keep spill area under surveillance until danger of fire or explosion has been eliminated.

❑ ________ 6. **Document All Actions**

Tank Overfill/Failure

SHIFT SUPERVISOR/INITIAL INCIDENT COMMANDER

❑ ________ 1. **Report to Incident Site and Assess the Situation**

- The first person at the scene of the incident or assigned will assess the incident and report the nature and significance of the incident.

❑ ________ 2. **Collect Information Required for Initial Assessment**

- Tank number and location.
- Impact and/or hazards to other facilities.
- Extent of visible damage.
- Magnitude and direction of release.
- Material involved in release.
- Potential of ignition sources.
- Impact to drain systems, etc.

❑ ________ 3. **Notify Clean Islands Council, the Emergency Response Coordinator, and the Fire Department**

(see Section 1.2, *Notification*)

❑ ________ 4. **Activate Immediate Response Team**

- Brief members of the Immediate Response Team on the status of the incident.

❑ ________ 5. **Report Information Gathered to HECO Spill Management Team**

(see Section 1.2, *Notification*)

❑ ________ 6. **Initiate Required Government Agency Notifications**

(see Section 1.2, *Notification*)

–**continued**–

Tank Overfill/Failure

SHIFT SUPERVISOR/INITIAL INCIDENT COMMANDER (Continued)

❑ ________ **7. If Necessary, Direct Rescue of Injured and Evacuate Area** (see Section 1.3.3, *Evacuation Plan*)

- Direct response personnel to don protective clothing, as appropriate, and remove injured to upwind area.
- Direct evacuation of employees and contract personnel to safe areas upwind from spill.
- Control ignition sources.

❑ ________ **8. Formulate Incident Action Plan**

- Consider need to block drains, deploy boom, shutdown ignition sources, diking, containment, equipment and personnel availability, etc.

❑ ________ **9. Coordinate Contractors Involved in Response**

❑ ________ **10. Verify Safety of Response Personnel**

❑ ________ **11. Document All Actions and Observations**

- Submit reports as required.

Tank Overfill/Failure

SAFETY OFFICER

❑ ________ **1. Evaluate Immediate Public Health and Safety Risks**
- Attend to injured personnel.

❑ ________ **2. Recommend Site Control Measures to Isolate Public from Possible Exposure**

❑ ________ **3. Assess Environmental Conditions**
- Air and water monitoring.

❑ ________ **4. Recommend Immediate Actions to be Taken by Immediate Response Team to Protect Health and Safety**

❑ ________ **5. Conduct Site Safety Evaluation**

❑ ________ **6. Develop Site Safety Plan**
(see Appendix A, *Site Safety Plan*)

❑ ________ **7. Document All Actions**

THIS PAGE INTENTIONALLY LEFT BLANK

Pipe Rupture/Leak

UTILITY OPERATOR

❑ ________

1. Discontinue Operations

- Activate the Emergency Shutdown Procedures.
- Verify Safety of Personnel.
- Eliminate ignition Source(s).

❑ ________

2. Stop Release

- Stop the source of the release or verify that source is stopped.
- Shut off transfer pumps, close all header and tank valves, and drain remaining contents of hoses/pipelines back into tanks.
- Notify the control Room as appropriate.
- <u>Tank Truck/Hose Leak/Rupture</u> - Shut off transfer pumps using the emergency shutdown switch at the loading racks and drain the remaining contents of the hose into the tank truck.
- <u>Pipeline Leak/Rupture</u> - Stop transfer and isolate leaking section of pipeline. Evacuate contents of line with suction pump or flush with water to remove remaining product.
- <u>Storage Tank Flange/Valve Leak</u> – Stop transfer and tighten valve/ flange. If release continues, transfer tank contents to available tankage and repair and replace valve/flange.

❑ ________

3. Assess the Situation

- Source of release.
- General extent of release.
- Status of shutdown.
- Number of injured and their condition.
- Initial site monitoring: H_2S, O_2, benzene and LEL.
- Probable direction of vapors.
- Estimated quantity of release (see Sections 1.6.1 and 1.6.2, *Response Strategies*).
- Wind and weather conditions.
- Direction of movement (see Section 1.6.3, *Response Strategies*).
- Status of ignition sources.

–**continued**–

UTILITY OPERATOR (Continued)

❑ ________ **4. Notify Shift Supervisor of the Incident**

❑ ________ **5. Implement Site-Specific Response Strategy**

- Block storm drains and/or close Safe-Drain® valves.
- Keep spill area under surveillance until danger of fire or explosion has been eliminated.
  (see Section 1.6, *Response Strategies*)

❑ ________ **6. Document All Actions**

Pipe Rupture/Leak

SHIFT SUPERVISOR/INITIAL INCIDENT COMMANDER

❑ ________ **1. Report to Incident Site and Assess the Situation**

- The first person at the scene of the incident or assigned will assess the incident and report the nature and significance of the incident.

❑ ________ **2. Collect Information Required for Initial Assessment**

- Tank number.
- Impact and/or hazards to other facilities.
- Extent of visible damage.
- Magnitude and direction of release.
- Material involved in release.
- Potential of ignition sources.
- Impact to drain systems, etc.

❑ ________ **3. Notify Clean Islands Council, the Emergency Response Coordinator and the Fire Department**

(see Section 1.2, *Notification*)

❑ ________ **4. Activate Immediate Response Team**

- Brief members of the Immediate Response Team on the status of the incident.

❑ ________ **5. Report Information Gathered to HECO Spill Management Team**

(see Section 1.2, *Notification*)

❑ ________ **6. Initiate Required Government Agency Notifications**

(see Section 1.2, *Notification*)

–**continued**–

SHIFT SUPERVISOR/INITIAL INCIDENT COMMANDER (Continued)

❑ ________ **7. If Necessary, Direct Rescue of Injured and Evacuate Area**

(see Section 1.3.3, Evacuation Plan)

- Direct response personnel to don protective clothing, as appropriate, and remove injured to upwind area.
- Direct evacuation of employees and contract personnel to safe areas upwind from spill.
- Control ignition sources.

❑ ________ **8. Formulate Incident Action Plan**

- Consider need to block drains, deploy boom, shutdown ignition sources, diking, containment, equipment and personnel availability, etc.

❑ ________ **9. Coordinate Contractors Involved in Response**

❑ ________ **10. Verify Safety of Response Personnel**

❑ ________ **11. Document All Actions and Observations**

- Submit reports as required.

SAFETY OFFICER

- [ ] ________ 1. **Evaluate Immediate Public Health and Safety Risks**
  - Attend to injured personnel.
- [ ] ________ 2. **Recommend Site Control Measures to Isolate Public from Possible Exposure**
- [ ] ________ 3. **Assess Environmental Conditions**
  - Air and water monitoring.
- [ ] ________ 4. **Recommend Immediate Actions to be Taken by Immediate Response Team to Protect Health and Safety**
- [ ] ________ 5. **Conduct Site Safety Evaluation**
- [ ] ________ 6. **Develop Site Safety Plan**
  (see Appendix A, *Site Safety Plan*)
- [ ] ________ 7. **Document All Actions**

THIS PAGE INTENTIONALLY LEFT BLANK

Other Equipment Failure

UTILITY OPERATOR

❑ ________ **1. Discontinue Operations**

- Activate the Emergency Shutdown procedures.
- Verify Safety of Personnel.
- Eliminate ignition source(s).

❑ ________ **2. Stop Release**

- Stop the source of the release or verify that source is stopped.
- Shut off transfer pumps, close all header and tank valves, and drain remaining contents of hoses/pipelines back into tanks.
- Notify the Control Room as appropriate.
- Truck Tank/Valve Leak – Shut down transfer and attempt to close valve or repair leak. Pump out any leaking tank compartments.
- Storage Tank Flange/Valve Leak – Stop transfer and tighten valve/ flange. If release continues, transfer tank contents to available tankage and repair and replace valve/flange.

❑ ________ **3. Assess the Situation**

- Source of release.
- General extent of release.
- Status of shutdown.
- Number of injured and their condition.
- Initial site monitoring: O_2, benzene and LEL.
- Probable direction of vapors.
- Estimated quantity of release (see Sections 1.6.1 and 1.6.2, *Response Strategies*).
- Wind and weather conditions.
- Direction of movement (see Section 1.6.3, *Response Strategies*).
- Status of ignition sources.

–**continued**–

Other Equipment Failure

UTILITY OPERATOR (Continued)

❑ ________ **4. Notify Shift Supervisor of the Incident**

❑ ________ **5. Implement Site-Specific Response Strategy**

- Block storm drains and/or close Safe-Drain® valves.
- Keep spill area under surveillance until danger of fire or explosion has been eliminated.
  (see Section 1.6, *Response Strategies*)

❑ ________ **6. Document All Actions**

Other Equipment Failure

SHIFT SUPERVISOR/INITIAL INCIDENT COMMANDER

❑ ________ **1. Report to Incident Site and Assess the Situation**

- The first person at the scene of the incident or assigned will assess the incident and report the nature and significance of the incident.

❑ ________ **2. Collect Information Required for Initial Assessment**

- Location of the tank.
- Impact and/or hazards to other facilities.
- Extent of visible damage.
- Magnitude and direction of release.
- Material involved in release.
- Potential of ignition sources.
- Impact to drain systems, etc.

❑ ________ **3. Notify Clean Islands Council, the Emergency Response Coordinator, and the Fire Department**

(see Section 1.2, *Notification*)

❑ ________ **4. Activate Immediate Response Team**

- Brief members of the Immediate Response Team on the status of the incident.

❑ ________ **5. Report Information Gathered to HECO Spill Management Team**

(see Section 1.2, *Notification*)

❑ ________ **6. Initiate Required Government Agency Notifications**

(see Section 1.2, *Notification*)

–**continued**–

Other Equipment Failure

SHIFT SUPERVISOR/INITIAL INCIDENT COMMANDER (Continued)

❑ ________ 7. **If Necessary, Direct Rescue of Injured and Evacuate Area** (see Section 1.3.3, *Evacuation Plan*)
- Direct response personnel to don protective clothing, as appropriate, and remove injured to upwind area.
- Direct evacuation of employees and contract personnel to safe areas upwind from spill.
- Control ignition sources.

❑ ________ 8. **Formulate Incident Action Plan**
- Consider need to block drains, deploy boom, shutdown ignition sources, diking, containment, equipment and personnel availability, etc.

❑ ________ 9. **Coordinate Contractors Involved in Response**

❑ ________ 10. **Verify Safety of Response Personnel**

❑ ________ 11. **Document All Actions and Observations**
- Submit reports as required.

Other Equipment Failure

SAFETY OFFICER

- ❑ ________ **1. Evaluate Immediate Public Health and Safety Risks**
  - Attend to injured personnel.
- ❑ ________ **2. Recommend Site Control Measures to Isolate Public from Possible Exposure**
- ❑ ________ **3. Assess Environmental Conditions**
  - Air and water monitoring.
- ❑ ________ **4. Recommend Immediate Actions to be Taken by Immediate Response Team to Protect Health and Safety**
- ❑ ________ **5. Conduct Site Safety Evaluation**
- ❑ ________ **6. Develop Site Safety Plan**
  (see Appendix A, *Site Safety Plan*)
- ❑ ________ **7. Document All Actions**

THIS PAGE INTENTIONALLY LEFT BLANK

1.2 REPORTING AND NOTIFICATION

SPILLAGE OF ANY PETROLEUM HYDROCARBON OR OTHER HAZARDOUS SUBSTANCE ONTO LAND OR WATER MUST BE REPORTED TO THE SHIFT SUPERVISOR! THERE ARE NO EXCEPTIONS!

The HECO Incident Commander should confirm that all spills from the Kahe Generating Station or Kahe 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 prioritized notification flow chart, and Table 1.2-1 provides a spill reporting chart to ensure that the spill is reported to state and federal agencies within 30 minutes of discovery. Table 1.2-2 provides first priority emergency response telephone numbers for HECO personnel and response contractors. Figures 1.2-2 and 1.2-3 provide HECO and agency spill report forms which can be used to record information concerning the spill. The Discharge Information Checklist (Figure 1.2-3) should be completed as thoroughly as possible before initiating agency notifications. Notification should NOT be delayed pending completion of the form.

Table 1.2-3 is provided to document the completion of notifications.

Additional telephone numbers are listed in the following tables:

Table 1.2-4	State and Federal Agencies
Table 1.2-5	Hospitals
Table 1.2-6	Media Organizations (television, newspapers, radio)
Table 1.2-7	Schools
Table 1.2-8	Sensitive Area Managers

Phone numbers for vendors and suppliers are listed in Section 3.5.

HECO 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 DOH, USCG, or EPA.

No statements 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.

Figure 1.2-1
Prioritized Notification Flow Chart

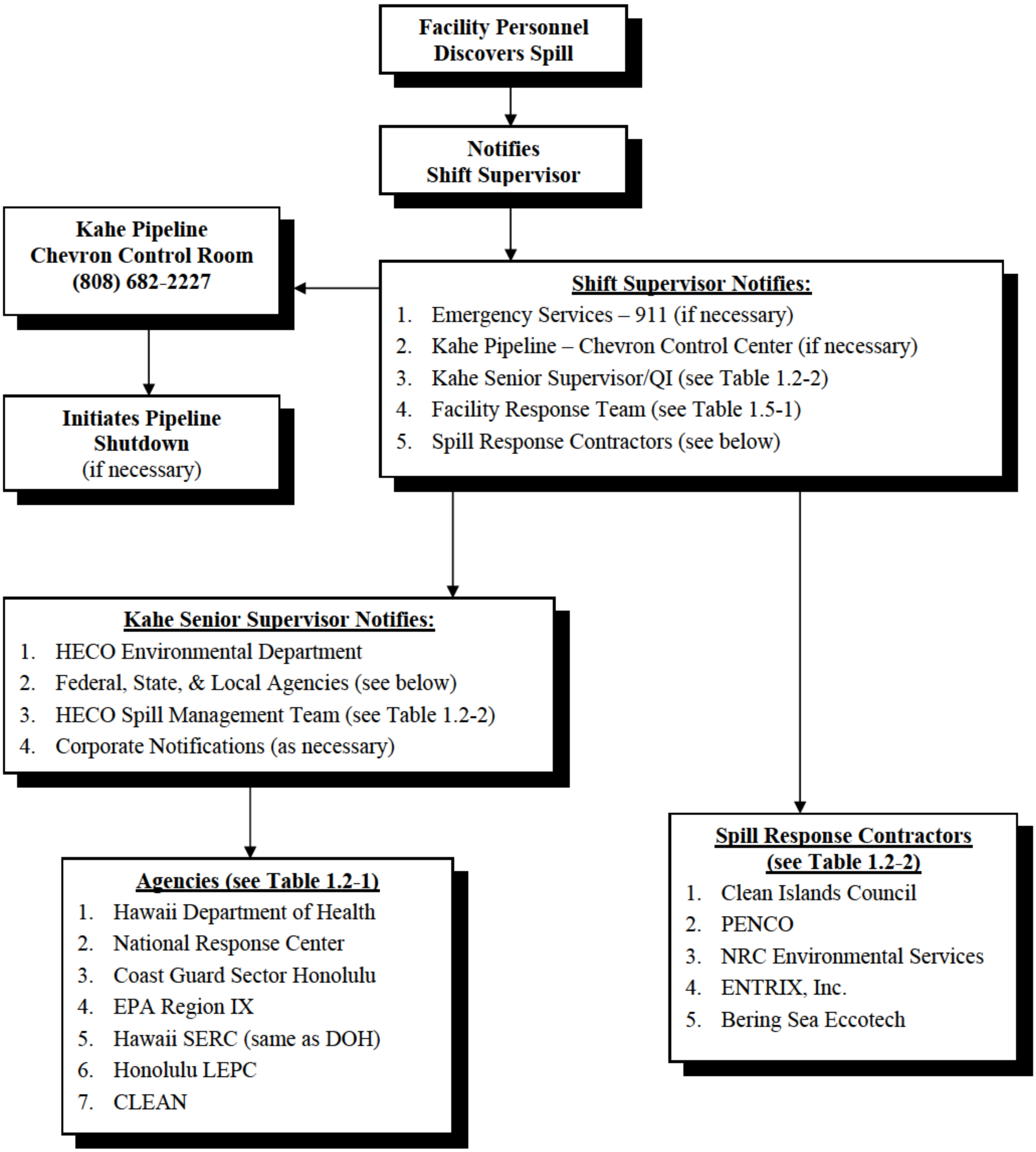


Table 1.2-1
Agency Notification Information

Agency	Spill Size	Verbal Report	Telephone Number	Written Report
Hawaii Department of Health (DOH) Hazard Evaluation and Emergency Response Office	Any spill of any size	Within 30 minutes	(808) 586-4249 After hours: (808) 247-2191	30 days
National Response Center (NRC)	Any spill that enters or threatens to enter navigable waters	Within 30 minutes	(800) 424-8802	
Coast Guard Sector Honolulu	Any spill that enters or threatens to enter navigable waters	to NRC 30 minutes (call directly as time allows)	(808) 842-2600	
U.S. Environmental Protection Agency (EPA), Region IX	Any spill that enters or threatens to enter navigable waters	to NRC 30 minutes (call directly as time allows)	(800) 300-2193 (866) 372-9378	90 days if > 1,000 gallons
Hawaii State Emergency Response Commission (HSERC)	Any spill of any size	Within 30 minutes	See DOH	
Local Emergency Planning Committee (LEPC)	Any spill of any size	Within 30 minutes	(808) 723-8960 Carter Davis	
Honolulu Fire Department	Only large spills or spills that involve fire or explosion hazard	Within 30 minutes	(808) 543-4411 or 911	
City and County of Honolulu, Department of Emergency Management	Any incident requiring evacuation	As soon as possible	See LEPC	
Campbell Local Emergency Action Network (CLEAN)	Only large spills or spills that involve fire or explosion hazard	Within 30 minutes	(808) 674-3388	
Note: The National Response Center must be called even if the release is reported to a local number.				

Table 1.2-2
HECO Personnel and Response Contractor Notification

Name	Title	Office	Cellular	Pager
Kahe Generating Station – Qualified Individuals				
Anthony Ramelb	Kahe Senior Supervisor	(808) 543-4140	(b) (6) [redacted]	NA
Teddy Canterbury	Kahe/CIP Operations Superintendent	(808) 543-4100	[redacted]	(808) 363-0710
Antony Taparra	Waiau/Honolulu Operations Superintendent	(808) 543-4321	[redacted]	NA
Mark Yamashiro	Honolulu Senior Supervisor	(808) 543-4556	[redacted]	NA
Steven Chang	Waiau Senior Supervisor	(808) 543-4319	[redacted]	NA
Zigmund Frompovicz	Maintenance Superintendent	(808) 543-4230	[redacted]	NA
Karen Mark	Planning Superintendent	(808) 543-4237	[redacted]	(808) 361-9606
Note: These positions will be filled interchangeably by the employees named (including the alternate IC)				

HECO Spill Management Team	SMT Position	Office	Cellular
Richard Rosenblum President and CE	NA	(808) 543-4400	(b) (6) [redacted]
Ronald Cox Vice President, Power Supply	Incident Commander	(808) 543-4303	[redacted]
Brenner Munger Manager, Environmental Department	Deputy IC	(808) 543-4500	[redacted]
Rick Ravelo Director, Safety Division	Safety Officer	(808) 543-7073	[redacted]
Lynne Unemori Vice President, Corporate Relations	Public Information Officer	(808) 543-7972	[redacted]
Darcy Endo-Omoto, Vice President, Government & Community Affairs	Liaison Officer	(808) 543-5888	[redacted]
Lawrence Ornellas Power Supply Generation Manager	Operations Section Chief	(808) 543-4245	[redacted]
Karen Mark Planning Superintendent, Gen Dept	Planning Section Chief	(808) 543-4237	[redacted]
Shawn Tasaka Acting Manager, Support Servies	Logistics Section Chief	(808) 543-7520	[redacted]
Patsy Nanbu Controller	Finance Section Chief	(808) 543-7424	[redacted]

Response Contractors	Response Duties	Phone (24 hr)	Response Time
Clean Islands Council	Oil Spill Cooperative	(808) 845-8465 (808) 536-5814	2 hrs
Pacific Environmental Co. (PENCO)	Onwater and Shoreline Cleanup	(808) 545-5195	2 hrs
NRCES	Tier 2/Tier 3 Response (Major Spills)	(800) 337-7455	12 to 24 hrs
ENTRIX, Inc.	SCAT/NRDA Consulting	(800) 476-5886	12 hrs
Bering Sea Eccotech	Shoreline Cleanup	(808) 216-3175	2 hrs

Figure 1.2-2
HECO Spill Report Form

The following written report may be used for all hydrocarbons or chemicals to ground or water. A copy of the written report should be faxed (543-4511) or emailed to the Environmental Department after notification and mitigation procedures have been implemented.

Date of Discharge:	**Time of Discharge:**
Date Reported To HECO Environmental Department:	
Time Reported To HECO Environmental Department:	
Person Reported To In HECO Environmental Department:	
Person(s) Involved or Reporting Discharge:	
Type of Substance Discharged:	
Amount of Substance Discharged:	
Location of Discharge:	
Cause of Discharge:	
Approximate Amount of Discharge Recovered As Free Oil:	
Containment & Clean-up Actions Taken:	
Actions Taken To Prevent Recurrence Of Discharge:	
Signed: **Date:**	**Title:**

Figure 1.2-3
Discharge Information Checklist

DO NOT DELAY NOTIFICATION IN ORDER TO COLLECT ALL INFORMATION ON THIS SHEET
NATIONAL RESPONSE CENTER (NRC) (800) 424-8802
HAWAII DEPARTMENT OF HEALTH – HAZARD EVALUATION
AND EMERGENCY RESPONSE OFFICE (808) 586-4249

FILL OUT THIS FORM AS COMPLETELY AS POSSIBLE BEFORE NOTIFYING AGENCIES. WHEN REPORTING INFORMATION, BE AS CONCISE AND ACCURATE AS POSSIBLE.

- ☐ Caller's Name and Title: ____________________
- ☐ Caller's Phone Number: ____________________
- ☐ Calling for: Hawaiian Electric Company: ____________________
- ☐ Facility Location: **Kahe Generating Station – 92-200 Farrington Highway, Kapolei, HI 96707**
  Latitude: (b) (7)(F), (b) (3) [redacted] **Longitude:** (b) (7)(F), (b) (3) [redacted]
- ☐ Telephone Number: (808) 543-4100
- ☐ Date and time the incident occurred or was discovered: ____________________
- ☐ Specific location of the incident:
- ☐ Name/type of material spilled or released: ____________________
- ☐ Source of the spilled material: ____________________
- ☐ Tank Capacity (if applicable): ____________________
- ☐ Cause of release: ____________________
- ☐ Vessel name, railcar/truck number or other identifying information: ____________________
  ____
- ☐ Total quantity discharged or at risk: ____________________
- ☐ Was material released to air, ground, water or subsurface: ____________________
- ☐ Amount spilled into water: ____________________
- ☐ Appearance of any slick (size, direction and speed of movement: ____________________
  ____
- ☐ Weather conditions/Tides (sea state, wind speed/direction, precipitation, visibility): ____________________
  ____
- ☐ Remedial actions taken or planned (control, containment, or cleanup): ____________________
  ____
- ☐ Current condition of the facility: ____________________
- ☐ Number and type of injuries or fatalities: ____________________
- ☐ Estimated dollar amount of property damage: ____________________
- ☐ Other agencies that you have notified or plan to immediately notify: ____________________
  ____
- ☐ Other information: ____________________
- ☐ Sensitive areas at risk: ____________________
  ____
- ☐ Contractors Dispatched: ____________________

Table 1.2-3
Notification List for Emergency Response Organizations

Agency	Contact	Mobile/Pager	Telephone Office	Date Time	Person Answering	Brief Notes Concerning Notification #'s Etc.
Clean Islands Council (CIC)	Kim Beasley	(b) (6) [redacted]	(808) 845-8465			
Hawaii Department of Health (DOH) Hazard Evaluation and Emergency Response Office (HEERO)		[redacted]	(808) 586-4249 (808) 247-2191 (after hours)			
National Response Center (NRC)		[redacted]	(800) 424-8802			
HECO Environmental Department	Kirk Tomita	[redacted]	(808) 543-4528			
	Donn Fukuda	[redacted]	(808) 543-4525			
Coast Guard Sector Honolulu		[redacted]	(808) 842-2600			
Environmental Protection Agency (EPA)		[redacted]	(800) 300-2193			
Hawaii State Emergency Response Commission (HSERC)		[redacted]	See DOH			
Local Emergency Planning Commission (LEPC)		[redacted]	911 (808) 723-8960			
Honolulu Fire Department		[redacted]	911 (808) 543-4411			
City/County of Honolulu – Department of Emergency Management	Melvin Kaku	[redacted]	(808) 723-8960			
NRC Environmental Services		[redacted]	(800) 337-7455			
ENTRIX, Inc. (SCAT/NRDA)		[redacted]	(800) 476-5886			
International Bird Rescue Research Center (IBRRC)		[redacted]	(707) 207-0380			
Unitek		[redacted]	(808) 831-3076			
PENCO	Rusty Nall	[redacted]	(808) 545-5195			
Bering Sea Eccotech		[redacted]	(808) 216-3175			

Note: As appropriate notifications are made, record the contact information is the spaces provided. Also include any significant notes.

Table 1.2-4
State and Federal Agencies

State Agencies	Phone Number
Hawaii Department of Health (DOH)/HEERO	(808) 586-4249 (808) 247-2191 (24 hr)
Hawaii Department of Land and Natural Resources:	
Aquatic Resources Division	(808) 587-0100
Historic Preservation Division	(808) 692-8015
Division of Forestry and Wildlife	(808) 587-0166
Hawaii Department of Transportation – Harbors Division, Deputy Director	(808) 587-3651
Federal Agencies	
U.S. Coast Guard Sector Honolulu	(808) 842-2600
U.S. Environmental Protection Agency (EPA)	(800) 300-2193
U.S. Dept. of Commerce – National Marine Fisheries Service, Pacific Islands Region	(808) 944-2200
U.S. Dept. of Interior – Fish and Wildlife Service, Hawaii Administrative Site	(808) 792-9550
NOAA – Humpback Whale National Marine Sanctuary, State Office	(808) 587-0106
Local Agencies/Organizations	
Office of Hawaiian Affairs	(808) 594-1888
Chamber of Commerce of Hawaii	(808) 545-4300
Hawaii Visitors and Convention Bureau	(808) 923-1811
Aloha Towers Condominium Association	(808) 923-7061
Retail Merchants of Hawaii	(808) 592-4200
City & County of Honolulu Department of Parks & Recreation	(808) 768-3003

Table 1.2-5
Hospitals and Medical Facilities

Name	Address	Telephone
Pali Momi Medical Center	98-1079 Moanalua Rd Aiea, Hawai'i 96701	(808) 486-6000
Straub Hospital	888 S. King St. Honolulu, HI 96813	(808) 522-4000 Main (808) 522-3781 Emergency
Queens Medical Center	1301 Punchbowl St. Honolulu, HI 96813	(808) 538-9011 Main (808) 691-4311 Emergency
Kuakini Medical Center	347 N. Kuakini St. Honolulu, HI 96817	(808) 536-2236 Main (808) 547-9540 Emergency
Waianae Coast Comprehensive Health	82-260 Farrington Hwy.	(808) 697-3300 Main
Wahiawa General Hospital	128 Lehua St. Wahiawa, HI 96786	(808) 621-8411

Table 1.2-6
Media Organizations

Name	Address	Telephone
Television		
KHON (Fox)	88 Piikoi Street Honolulu, HI	(808) 591-2222
KITV (ABC)	801 S King St Honolulu, HI	(808) 535-0400
KFVE (K5, The Home Team) Hawaii News Now	420 Waiakamilo Rd Honolulu, HI	(808) 847-9375
KGMB (CBS) Hawaii News Now	420 Waiakamilo Rd Honolulu, HI	(808) 847-3246
KHET (PBS)	2350 Dole St Honolulu, HI	(808) 973-1000
KHNL (NBC) Hawaii News Now	420 Waiakamilo Rd Honolulu, HI	(808) 847-3246

Table 1.2-6 (Continued)
Media Organizations

Name	Address	Telephone
Television (Continued)		
KIKU (Japanese Program)	737 Bishop St., Suite 1430 Honolulu, HI	(808) 847-2021
Oleo The Corp for Community	1122 Mapunapuna St Honolulu, HI	(808) 834-0007
Newspapers		
Honolulu Star Advertiser	7 Waterfront Plaza, Suite 210, 500 Ala Moana, Honolulu, HI, 96813	(808) 529-4747
Associated Press	500 Ala Moana Blvd #7-590 Honolulu, HI	(808) 536-5510
Pacific Business News	737 Bishop St, Suite 1590 Honolulu, HI 96813	(808) 855-8100
Radio		
KSSK, KDNN, KHBZ, KIKI & KUCD	650 Iwilei Rd #400 Honolulu, HI	(808) 550-9200
KHVH	650 Iwilei Rd #400 Honolulu, HI	(808) 521-8383
KAIM, KGU-AM, KHNR, KGMZ, KKOL	1160 N. King St, 2nd Floor Honolulu, HI	(808) 533-0065
KINE, KRTR & KCCN	900 Fort Street Mall #700 Honolulu, HI	(808) 275-1000
ESPN 1420	900 Fort Street Mall #700 Honolulu, HI	(808) 536-2728
KWAI	100 N Beretania St #401 Honolulu, HI	(808) 523-3868
KLHT	98-1016 Komo Mai Drive Aiea, HI	(808) 524-1040
Airborne Traffic	Honolulu, HI	(808) 521-4234
KZOO	2454 S. Beretania St Honolulu, HI	(808) 947-5966
KJPN	711 Kapiolani Blvd #750 Honolulu, HI	(808) 593-1950

Table 1.2-6 (Continued)
Media Organizations

Name	Address	Telephone
Radio (Continued)		
KAHA	765 Amana St #203 Honolulu, HI	(808) 949-5242
KUMU, KPOI & KQMQ	1000 Bishop St, #200 Honolulu, HI	(808) 947-1500
KANO, KHPR, KIPO, KKUA	738 Kaheka St #101 Honolulu, HI	(808) 955-8821
KNDI	1734 S King St Honolulu, HI	(808) 946-2844
KTUH	2445 Campus Rd Hemenway Hall, #203 Honolulu, HI	(808) 956-7431
KXME	900 Fort Street Mall, #200 Honolulu, HI	(808) 275-1000
H Hawaii Media – Oahu (KORL)	900 Fort Street Mall, #450 Honolulu, HI	(808) 538-1180

Table 1.2-7
Schools

Name	Address	Telephone
Adventist Malama Elementary School	86-072 Farrington Hwy Waianae, HI 96792	808-696-3988
Barbers Point Elementary School	3001 Boxer Rd Kapolei, HI 96707	(808) 673-7400
Island Pacific Academy	909 Haumea Street Kapolei, HI 96707	(808)674-3523
Kamaile Academy Public Charter School	85-180 Ala Akau Street Waianae, HI 96792	808) 697-7110
Kapolei Elementary School	91-1119 Kamaaha Loop Kapolei, HI 96707	(808) 693-7002
Kapolei Middle School	91-5335 Kapolei Pkwy Kapolei, HI 96707	(808) 693-7025
Kapolei High School	91-5007 lei Pkwy Kapolei, HI 95707	(808) 692-8200
Leihoku Elementary School	86-285 Leihoku Street Waianae, HI 96792	(808) 697-7100
Ma'ili Bible School	87-138 Gilipake Street, Waianae, HI, 96792	(808) 696-3038
Ma'ili Elementary School	87-360 Kula'aupuni Street Waianae, HI 96792	(808) 697-7150
Makaha Elementary	84-200 Ala Naauao Place Waianae, HI 96792	(808) 695-7900
Makakilio Elementary School	92-675 Anipeahi St Kapolei, HI 96707	(808) 672-1122
Mauka Lani Elementary	92-1300 Panana Street Kapolei, HI 96707	(808) 672-1100
Nanaikapono Elementary School	89-195 Farrington Hwy Waianae, HI 96792	(808) 668-5800
Nanakuli Elementary School	89-778 Haleakala Ave Waianae, HI	(808) 668-5813
Nanakuli Intermediate & High School	89-980 Nanakuli Ave Waianae, HI	(808) 668-5823

Table 1.2-7
Schools (continued)

Name	Address	Telephone
Seagull Elementary School at Kapolei	91-531 Farrington Hwy Kapolei, HI 96707	(808) 674-1444
Seagull School at Ko Olina (Pre-school)	92-1415 Ali'inui Drive Kapolei, HI 96707	(808)671-6999
Waianae Elementary School	85-220 McArthur Street Waianae, HI 96792	(808) 697-7083
Waianae Intermediate School	85-626 Farrington Highway Waianae, HI 96792	(808) 697-7121
Waianae High School	85-251 Farrington Highway Waianae, HI 96792	(808) 697-9400

Table 1.2-8
Sensitive Area Managers

Resource	Agency/Trutstee	Phone
Parks	Honolulu Department of Parks and Recreation	(808) 768-3003
Coral Reefs	Hawaii Department of Land and Natural Resources/ Aquatic Resources Division	(808) 587-0100
Turtles/Marine Mammals	National Marine Fisheries Service (NMFS), Pacific Islands Region	(808) 944-2200
Kahe Water Intake	HECO Kahe Power Plant	(808) 543-4100

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!

The Health and Safety Plan in Appendix A can be used to identify hazards to responders during the initial response. Additional health and safety information, presented in Section 2200 of the HACP can be used to develop a more detailed site safety plan.

1.3.1 Initial Response

The Shift Supervisor, as the initial Incident Commander, will be responsible to assure the safety of all people who may be impacted by the spill. The Shift Supervisor will initially assume the role of Safety Officer and should enlist the help of the Director, Corporate Safety Division. The Safety and Security Department personnel will assume the role of the Safety Officer as soon as possible. The HECO Safety Officer will be responsible for the preparation of the Site Safety Plan, and will be responsible for direction of all safety and security activities during a major HECO spill response. All spill response contractor Safety Officers will be advisors to the HECO Safety Officer on health and safety issues. The HECO Safety Officer will direct teams of trained operators equipped with personal protective equipment (PPE), organic vapor respirators, and explosion meters to determine and mark the area of any vapors emanating from the spill so that safe limits for response activities can be determined.

Safety & Security Department Personnel			
Name	**Position**	**Office**	**Mobile**
Rick Ravelo	Director, Corporate Safety Division	543-7073	(b) (6) [redacted]
Emerson Lee	Specialist, Occupational Health & Safety	543-7072	
Donna Denis	Specialist, Occupational Health & Safety	543-7768	

Hazards associated with oil spills include fires, explosions, and exposure to toxic chemicals at lethal or sublethal 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 tanker truck, 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 HECO 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 at the Kahe Generating Station and Kahe Pipeline may use spill response limits for petroleum distillates (i.e., 500 ppm for 8-hours or 333 ppm or 12 hours). PPE recommended for protecting ***SKIN*** includes PVC gloves and boots for hands/feet, and 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.

An Incident-Specific Health and Safety Plan will be prepared by the HECO Safety Officer. 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 Kahe Generating Station office and included in Appendix B of this FSRP. 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 HECO Safety Officer should be aware of local safety requirements for the state of Hawaii (HAR Chap. 12-99) and should establish a dialogue with oil spill response contractors to assure that safe work places are established for all responders which comply with local regulations.

1.3.3 Evacuation Plan

This Evacuation Plan is intended to provide procedures to evacuate the Kahe Generating Station in the event of an emergency or dangerous situation. The Senior Shift Supervisor may order the evacuation of the facility in the event of a fire, bomb threat, hazardous material release, fuel oil spill or other significant incident which may threaten employees or other personnel at the facility.

The primary signal to evacuate the Plant will be given over the loudspeaker system. An alternate evacuation signal is continuous ringing (longer than one minute) of the fire alarm bell. Facility alarms and pagers are tested monthly.

All evacuations will be conducted in an orderly manner that does not further endanger personnel. Shift Supervisors, Department Heads or Floor Monitors must account for, or otherwise verify that ALL of their employees (including contractor, visitor, and vendor personnel) are in a safe area or assigned area. A diagram of evacuation routes, locations of hazardous materials storage areas and the anticipated spill flow direction are shown on Figure 1.3-1.

If a threat to human population exists, the local fire department and the Campbell Local Emergency Action Network (CLEAN) should be contacted immediately for assistance with evacuation or implementation of other appropriate response measures as discussed in Section 2410 of the HACP.

In the event injured personnel require transportation to the hospital, ambulance services must be called (911). Ambulance services will decide on the most appropriate medical facility. In cases of electrical burns, injured personnel should be transported to Straub Hospital.

Community Outreach

In the event of a major oil spill, relationships with the involved community will play an important role in helping to effect a successful oil spill response effort. How that relationship is established can be determined, to a large degree, by the effectiveness and timeliness of two-way communication with community members.

A community outreach program is best implemented as part of a planned approach, rather than a reaction to an emergency situation. To earn credibility it will be critical that the communications effort be initiated early and continue throughout the spill response.

The community's expectations will be high. It is critical to establish a mutual-trust and this is best done through open and continual communications -- not only after-the-fact.

In recent years, substantial progress has been made in the efforts to prevent and respond to oil spills. While it is important for the community to understand these accomplishments, conveying such messages is often difficult to achieve during crisis situations. Therefore, the message is often best delivered to audiences prior to a crisis. Establishing a speakers bureau is a method of formalizing this particular phase of community outreach.

The Community Outreach Plan, presented in Section 2410 of the HACP, takes into consideration pre-incident programs such as a Speakers Bureau, as well as outreach efforts during a spill such as Town Hall meetings and communications with government officials.

The purpose of the Community Outreach effort is twofold:

1. To provide target audiences with the timely and necessary information they need in order to make proper decisions affecting their welfare and/or particular areas of concern.

2. To provide communities with advance information regarding oil spill prevention and spill response strategies and tactics in the event of a major spill.

In the event of an emergency oil spill situation that has the potential to impact a general population it is critical to provide rapid and accurate information to members of that population. Broadly, the information should include facts regarding the nature of the incident, safety precautions to be taken, and any other specific actions required of the public. Considerations should be made to tactics such as "shelter in place" or "evacuation", with special attention to people requiring special medical needs or assistance.

Ultimately, the goal is to provide communications regarding the protection of life, property and the environment.

Notifying the Public

The role of the Community Outreach Unit is to proactively reach the community and provide information about the oil spill incident before the individual community members ask for them.

Notifying the Community of Emergency Situations

In the event a major oil spill results in, or has the potential to result in, significant onshore impacts such as vapor plumes, the responsibility of notifying affected communities lies with City and County of Honolulu’s Department of Emergency Management (DEM). The Command Staff will work in cooperation with DEM representatives to ensure a timely and appropriate response.

> ***NOTE:*** *It is not the responsibility of the Command Staff or Community Outreach personnel to determine whether or not to recommend evacuation of an area. This responsibility lies with the Unified Command and the Hazard Evaluation and Emergency Response Branch of the Department of Health.*

Methods of notification, to be determined by DEM, may include the following: Emergency Alert System; news media; door-to-door; loudspeaker announcements via police or fire department. In such cases, notification extends beyond informing the public of the incident and focuses on alerting the community to specific actions to be taken for personal safety. It may include directing the public to specific community shelters or to shelter-in-place.

A list of contacts for Business Organizations, Community Organizations and Neighborhood Boards within the City and County of Honolulu are located in Section 2413 of the HACP. Emergency phone numbers are presented below:

Department of Emergency Management (808) 723-8960

Hawaii Life Flight (Air Ambulance) (808) 836-2000

In an Emergency, dial 911

In addition, CLEAN may be able to assist with public and community notification. CLEAN maintains its own alert system for the Campbell Industrial Park area. The number for the CLEAN hotline is (808) 674-3388.

Figure 1.3-1
Facility Diagram

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

[redacted]

THIS PAGE INTENTIONALLY LEFT BLANK

1.4 COMMUNICATIONS

Communication is critical to the smooth operation of the spill response. Today, there are numerous communications options available. Each has their advantages and disadvantages. This section describes the availability and assignment of communications equipment. Additional information is provided in Section 5110 of the HACP.

1.4.1 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. The communications center will maintain a "response phone book." This will contain a list of all land line, cellular and pager/beeper numbers. In addition, the assigned frequencies will be maintained as well. The ICS form number 205 will be used to record assigned numbers and frequencies. A sample ICS-205 form is presented in Figure 1.4-1. Air traffic control will be maintained by the Federal Aviation Administration (FAA). Additional hotline numbers and federal agency websites are indicated on Table 1.4-1.

Telephone Circuits – During a response the primary mode of communication is the telephone. The telephone system at the Hawaii Oil Spill Response Center is sufficient to handle the volume of telephone calls associated with most spills. 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. This might require establishing microwave or satellite links to these areas using contractor resources. The telephone company in Hawaii is:

- Hawaiian Telcom.
  Business Customers 808-643-4411
  Government Customers 808-643-3211

Cellular Telephone Systems – Cellular phones are the primary method of communication between the response organization and the field units/teams. 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.

The cellular telephones can be rented from:

Verizon thru HECO's cell phone coordinator (Bryce Tobara, 543-7179)

As cellular phones are issued, the holder and phone number must be recorded in the "Response Phonebook."

Figure 1.4-1
Sample ICS-205 Form

INCIDENT RADIO COMMUNICATIONS PLAN		**1. Incident Name**	**2. Date/Time Prepared**		**3. 0perational Period (Date/Time)**
4. Basic Radio Channel Utilization For Oil Spills (Sorted By Channel)					
FCC-Channel Usage	**Marine VHF Channel**	**Function (Purpose under this plan)**	**Frequency**	**Working Channel Assignment for this Event**	**Normal Working Freq'' / Remarks**
Port Operations	05A	Spill Operations as Assigned	156.250	Clean Islands Council	Sause Bros
Inter-ship safety	*06*	*Spill Operations Hailing Frequency*	*156.300*	*All Responders*	
Commercial	7A	Commercial	156.350		Hawaii Pilots primary
Commercial(Ship-Ship)	*08*	*Spill Operations Working Frequency*	*156.400*	*BURN GROUP*	*Secondary Hawaii Pilots*
Non-Commercial	09	Non-Commercial	156.450		secondary Hawaii Pilots
Commercial	10	Commercial	156.500	Chevron Mooring	American WB
Commercial	11	Spill Operations as Assigned	156.550	HECO	
Port Operations	12	Port Operations	156.600	Aloha Tower Check-In	
Navigation(Ship-Ship)	13	Bridge to Bridge	156.650	Bridge to Bridge	
Port Operations	14	Spill Operations as Assigned	156.700	Clean Islands Council/OSRO/HECO	Secondary OSRO
Distress Safety	*16*	*Distress Safety & Calling of Vessel/s*	*156.800*	*All Mariners*	
State of Hawaii	17	State Of Hawaii	156.850	State Of Hawaii	
Commercial	13A	Surface to Aircraft	156.900	Surface to Aircraft	HTB/Young Bros
Commercial	19A	Commercial	156.950		
SAR Working Channel	21A	SAR Working Channel	157.050	USCG Group Honolulu	
Maritime Safety	22A	Maritime Safety Broadcast	157.100	USCG Group Honolulu	
SAR Working Channel	23A	SAR Working Channel	157.150	USCG Group Honolulu	
Public correspondence	26-27	Public correspondence/Ship to shore	various	Marine Operator	
Vessel Traffic System	63A	Commercial	156.175	USCG Group Honolulu	
Commercial	67	Commercial	156.375		
Non-Commercial	68	Non-Commercial	156.425		
Non-Commercial	69	Non-Commercial	156.475	Pearl Harbor Control	
Non-Commercial	71	Non-Commercial	156.575		Voyager Primary
Non-Commercial	72	Non-Commercial (Ship -Ship only)	156.625	Pearl Harbor Control	Voyager Secondary
Port Operations	77	Commercial	156.375	USN SUP SALV	
Non-Commercial	78A	Non-Commercial	156.925		
Commercial	79A	Commercial	156.725		Atlantis
Commercial	80A	Commercial	157.025		
FOSC	*81A*	*FOSC Primary Working Channel*	*157.075*	*FOSC*	
FOSC	83	FOSC Secondary Working Channel	157.175	FOSC	
Digital Selective Calling	70				
Commercial	88	Commercial	157.425		American WB Atlantis
ICS 205	**Hawaii Oil Spill Response Center**		**11/98**	**Prepared By: ____________________**	**(Comms Unit)**

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 http://nrc.uscg.mil/nrchp.html

Federal Emergency Management Agency: www.fema.gov

U.S. Environmental Protection Agency: http://www.epa.gov/superfund/contacts/infocenter/ (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 Homeport, Department of Homeland Security:
https://homeport.uscg.mil/

U.S. Dept. of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Hazardous Materials Safety, HazMat Info Center Line 1-800-467-4922 and website: http://phmsa.dot.gov/hazmat

Department of Justice, Environment and Natural Resources Division:
http://www.justice.gov/enrd/

Department of the Interior: www.doi.gov

Department of Commerce, NOM: www.commerce.gov

Department of State: www.state.gov

Department of Defense: www.defense.gov

Nuclear Regulatory Commission: www.nrc.gov

<u>Pagers</u> - These are one-way radio communication systems which enable a person within range of the paging system transmitter to be alerted. Pagers are excellent to get a responder to call on a "not to interfere" basis. When used in combination with cellular phones, they are an excellent way to avoid the problems caused by the changing cell sites during roaming. Sources of supply for beepers and pagers are the same as those for cellular phones. As pagers are issued, the holder and phone number must be recorded in the "Response Phonebook." Pager numbers for HECO personnel are listed in Section 1.2.

<u>Computer Modem Systems</u> - Desktop computer systems with modems are located throughout the facility.

<u>Radio Communications</u> - Radio communication is the primary communication between the supervisor and teams/task forces working a response on-scene. A cellular telephone will link the on-scene supervisor and command center.

The Hawaii Oil Spill Response Center can patch radio calls to a land line telephone. When necessary, radio calls will be patched through the telephone system to the command center. This will reduce the amount of radio equipment that will be needed in the command center.

<u>Marine VHF Radio</u> – Cleanup operations on the water should be provided with Marine VHF radio equipment. Marine radios can be used for coordinating cleanup operations. Marine band mobile and portable units are available through the response contractors. See Figure 1.4-1 for FCC-Channel Usage and Section 3.6 for contractors' equipment available in the event of a spill.

Due to the limited number of VHF-FM channels available to the FOSC and the need for the FOSC to have direct contact with the lead person for each operational team/taskforce, this plan assigns channels to be used by the lead person of each operation that are compatible with the VHF-FM channels available to the FOSC. The lead person of each operation or their representative will monitor their assigned frequency to allow direct communications with the FOSC.

<u>VHF-FM Channel Assignments</u> - 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. The following VHF-FM channel assignments have been made:

- VHF-FM channel 05a will be used by Clean Islands Council (CIC) for liaison with the FOSC and may be used as the CIC's primary frequency.

- VHF-FM channel 6 will be the common response frequency. During response activities, all units with the capability of monitoring multi frequencies will monitor this channel. Channel 6 will be used as the general response information broadcast and as the hailing and calling frequency. Use of this channel for this purpose will allow for uncluttered non-response related traffic on VHF-FM 16.

- VHF-FM channel 11 will be used by HECO as the Responsible Party (RP) for liaison with the FOSC and may be used as HECO's primary frequency.

- VHF-FM channel 13 will maintain its traditional maritime purpose of providing maritime safety information, bridge to bridge.

- VHF-FM channel 14 will be used by the Secondary Oil Spill Response Organization (OSRO) for liaison with the FOSC and may also be used as HECO's primary frequency.

- VHF-FM channel 16 will be maintained for traditional maritime purpose. All response related hailing and calling will be conducted on VHF-FM channel 6. VHF-FM channel 16 is to be used for non-response related hailing, calling and emergency distress calling only.

- VHF-FM channel 18 will be used for surface to air communications. Aircraft will use FAA approved frequencies for air to air communications.

- VHF-FM channels 21, 22a, 23, 32, and 35 are under the direct control of Coast Guard Group Honolulu and are for Coast Guard use only, unless otherwise directed by Group Honolulu.

- VHF-FM channel 34 will be used by the State of Hawaii OSC for liaison with the FOSC. The State of Hawaii Civil Defense Communications Plan will direct state agencies internal communications.

- VHF-FM channel 77 will be used as the US Navy Supervisor of Salvage's (SUPSAL) primary frequency.

- VHF-FM channel 81A will be used as the FOSC's primary frequency.

- VHF-FM channel 83 as the FOSC's working frequency.

- VHF-FM channels 15, 20, 31, 33, 36, 37, 65a, 66a, 68, 71, 72, 73, 74, 78a will be used as directed by FOSC with concurrence of local Federal Communications Commission FCC representative.

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 Radio/Telephone 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.

Statewide Emergency Response Radio Frequencies - Hawaii State Radio communications are handled by the SERC.

1.4.2 Communication Resources

In then event of a spill, the HECO Incident Commander will immediately begin augmenting the response communication system as needed. For small to intermediate size spills, it is envisioned that the existing telephone lines, augmented by cellular telephones and the mobile radio units, should suffice. For a larger spill and a more sustained response, the Command Center may be relocated to the Hawaii Oil Spill Center where additional telephone lines are available.

Outside Communication Resources available to HECO are presented in Section 5090 of the HACP and are summarized below:

Coast Guard Group Honolulu - The communication center at Coast Guard Group Honolulu is capable of communication with all floating Coast Guard assets and is capable of communicating with civilian and commercial vessels as well.

Coast Guard Air Station Barbers Point - The communication center at Coast Guard Air Station Barbers Point is capable of communication with all flying Coast Guard assets as well as civilian and commercial aircraft.

Coast Guard Floating Assets - Each major Coast Guard Cutter has its own communication center. These vessels could serve as a communication platform during an offshore response.

State, County and City - The Civil Defense agencies (both state and county) can field communications equipment and communication professionals that can be used in the event of a pollen incident. In addition, the police and fire departments have their own communication system.

Clean Islands Council (CIC) - The Clean Island Council has established a communication suite in the Hawaiian Oil Spill Center that is capable of transmitting on land, air and ocean frequencies. The system can be patched into the existing telephone system at the response center, eliminating the need for installing separate speakers and repeaters.

Clean Islands Council's (CIC) OSRV Clean Islands - Not as sophisticated as their communication suite, the Clean Island Council's OSRV *Clean Islands* has the capability to communicate on land, air and ocean frequencies, too. The vessel could serve as a communications platform during a response.

The Marine Spill and Response Corporation's (MSRC) OSRV Hawaii Responder - The Marine Spill and Response Corporation's OSRV *Hawaii Responder* has a communication suite on-board that allows it to communicate land, air and ocean frequencies. Its communication room was designed to handle the communications with offshore assets while the vessel conducts other response operations.

1.4.3 Communication Integration

During a major response, the capabilities of any established communication network will be severally taxed. As new organizations become involved in a response, it will be necessary for them to integrate into the Incident Command System. In addition, if their communication system is not compatible with the established systems, their system will have to be integrated, too.

If possible it would be best to issue the new organization communication equipment that is compatible with the equipment already in use. If that is not practical, the new organization should provide the equipment necessary to add them to the network.

THIS PAGE INTENTIONALLY LEFT BLANK.

1.5 Spill Response Organization

This section describes the response organization within the first critical hours of the response while initial efforts focus on gaining control of the incident. As additional personnel and equipment are mobilized the organization will expand as necessary. The complete HECO oil spill response organization is shown in Section 3.3.

1.5.1 Initial Spill Response Team

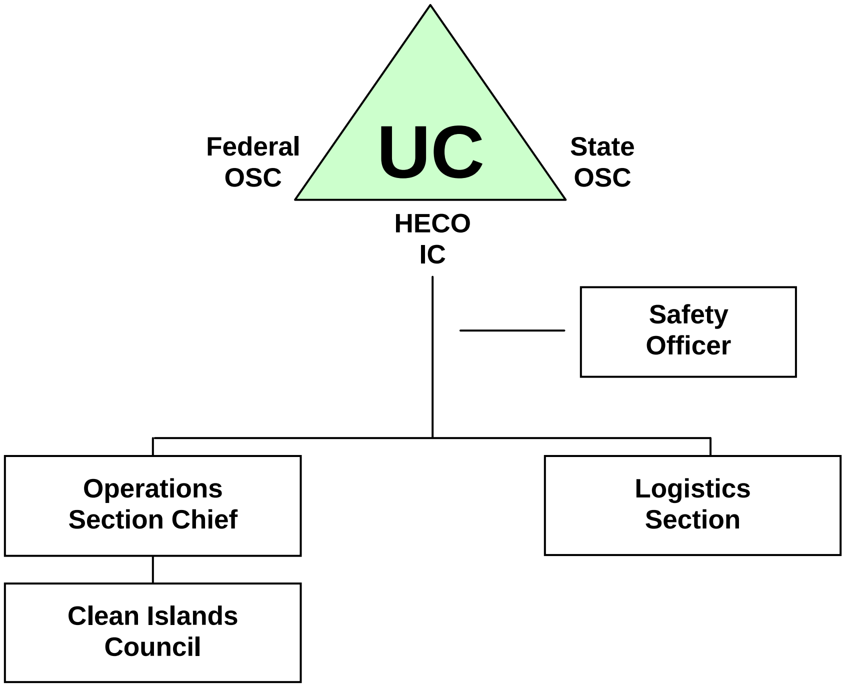
The Kahe Generating Station is normally staffed by at least one Utility Operator and the Shift Supervisor 24 hours a day. When transferring fuel through the Kahe Pipeline, a Utility Operator monitors the tank farm and assists in monitoring pipeline operations. Table 1.5-1 lists response personnel. The initial spill response organization is shown in Figure 1.5-1. A more extensive description of the response organization is presented in Section 3.3.

Table 1.5-1
Facility Response Team

Name		
Alcain, Romeo	Kekauoha, Walter	Paakaula Sr. , Solomon
Amantiad, Chad	Kila, Ivan	Pico, Brian
Au, Reynson	Liana, David	Ramos Jr., Daniel
Cabo, Jeffery	Mahoe, Allen	Sabagala, Alvin
Camarillo, Melvin	Mandawe, Larry	Sato, Eric
Daems, Wesley	Miyahira, Keith	Sebresos, Zanyck
Fernandez, Sheldon	Mosher, Dennis	Sivalop, Eddie
Franco, Roy	Motta Jr., Raymond	Sonson, Jerry
Franklin, Craig	Nakamura, Aaron	Sousa, Steven
Hartbarger, Bryan	Nebrija, Michael	Tabisola, Roque
Hironaka, Dennis	Osurman Jr., Donald	

- In general the station Maintenance personnel are the initial response team
- Response times vary from 90-120 minutes.
- All Response Team personnel are 24-hour Hazwoper Trained.
- Contact information is on file with the facility supervisors (Shift Supervisor or Maintenance Supervisor)

Figure 1.5-1
Initial Response Organization



In general, personnel at the Kahe Generating Station will be assigned the following jobs during the first 2 hours of an oil spill response.

1. **Qualified Individuals** of the Kahe Generating Station are as follows:

Name	Position	Contact Information		Response Training Experience
Anthony Ramelb	Kahe Senior Supervisor	Cell: [redacted]	Mobile: [redacted]	QI, IC - Training records on file at facility
		Work: 543-4140	Home: [redacted]	
	Address:	[redacted]		
Teddy Canterbury	Operations Superintendent (Kahe, CIP, BPTF)	Cell: [redacted]	Pgr: 363-0710	QI, IC - Training records on file at facility
		Work: 543-4100	Home: [redacted]	
	Address:	[redacted]		
Steven Chang	Waiau Senior Supervisor	Cell: [redacted]	Pgr: --	QI, IC - Training records on file at facility
		Work: 543-4319	Home: [redacted]	
	Address:	[redacted]		
Mark Yamashiro	Honolulu Senior Supervisor	Cell: [redacted]	Pgr: --	QI, IC - Training records on file at facility
		Work: 543-4556	Home: --	
	Address:	[redacted]		
Zigmund Frompovicz	Maintenance Superintendent	Cell: [redacted]	Pgr: --	QI, IC - Training records on file at facility
		Work: 543-4230	Home: [redacted]	
	Address:	[redacted]		
Anthony Taparra	Operations Superintendent (Waiau, Honolulu)	Cell: [redacted]	Pgr: --	QI, IC - Training records on file at facility
		Work: 543-4321	Alt Cell: [redacted]	
	Address:	[redacted]		
Karen Mark	Planning Superintendent	Cell: [redacted]	Pgr: 361-9606	QI, IC - Training records on file at facility
		Work: 543-4237	Home: [redacted]	
	Address:	[redacted]		

2. The **Utility Operators** will become the Operations Section Chief of the initial Incident Command group. The Utility Operators will initially respond in a defensive manner to mitigate the spill, notify the Shift Supervisor, and attempt to control the spread of the oil. Utility Operators will perform initial site safety checks and block storm drains. A spill response checklist has been provided for the Utility Operators in Section 1.1 of this FSRP.

3. The **Shift Supervisor** will become the initial Incident Commander and Safety Officer. Using the checklist provided in Section 1.1, he/she will ensure that appropriate notifications are made, and take steps to mitigate impacts of the spill.

4. **Clean Islands Council (CIC)** is HECO's primary response contractor. Upon arrival at a spill site, representatives from CIC will report to and participate in the Operations Section and Logistics Section to assure that equipment arrives on the scene as needed.

1.5.2 One- to Two-Hour Spill Response Equipment and Personnel

Facility-owned response equipment is limited to sorbent materials and personal protective equipment (PPE) as listed in Section 3.5. Equipment locations (absorbents and storm drain blockers) are shown on Figures 1.3-1. Facility-owned response equipment is inspected monthly using the checklist provided in Section 3.1. Contracted oil spill response equipment is tested and maintained by OSROs as described in Section 3.6.

Clean Islands Council (CIC) is under contract with HECO to provide spill response services. The CIC oil spill response vessel (OSRV), "Clean Islands," is docked at Pier 35 in Honolulu Harbor. Upon notification of an incident, boom from the OSRV can be deployed within one hour to comply with 40 CFR 112, Appendix E, 3.3.1. A skimmer capable of being deployed within two hours (to meet the requirements of 40 CFR 112, Appendix E, 3.3.2) is also maintained by CIC on the OSRV in Honolulu Harbor. Additional response equipment (as listed in Section 3.6) is stored at the CIC warehouse and at nearby Barber's Point.

Response Equipment Inspections

HECO relies upon its response contractors to maintain equipment and conduct the required inspections and exercises. Records of equipment inspections and exercises are available from the response contractors.

1.5.3 HECO Spill Management Team

HECO has established a Spill Management Team (team duties and responsibilities are identified in Section 3.3 of this FSRP). Any or all of the team members (located in Honolulu and on Oahu) can be made available as needed for a response to a spill from the Kahe Generating Station and Pipeline. Arrival time of team members will vary. It is anticipated that most team members could arrive within 2 to 4 hours of notification. Additional information on the HECO Spill Management Team and Incident Command System is provided in Section 3.3.

The HECO Spill Management Team maintains cellular telephones, portable radios, computers, printers, and fax machines immediately available for use. Team members are trained to work as commanders, officers, chiefs, and responders under the Incident Command System.

1.5.4 Volunteers

HECO does not intend to utilize citizen volunteers for spill response. All individuals who volunteer will be referred to persons designated by the Federal and/or State On-Scene Commanders.

Members of Clean Islands Council (CIC) have trained personnel who may be available to provide mutual assistance during an oil spill. These individuals will be directed to report to the HECO Incident Commander for job assignments.

THIS PAGE INTENTIONALLY LEFT BLANK

1.6 RESPONSE STRATEGIES

In the event an oil spill occurs at the Kahe Generating Station or Kahe 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 coastline maps is provided in the Hawaiian Area Contingency Plan (HACP) and Part 2 of this FSRP. The sequence of response activities will generally follow those presented in the Response Decision Diagram shown in Figure 1.6-1.

Personnel Safety

While HECO 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 hydrogen sulfide gas (H_2S) is present or suspected, and action would not be taken until the H_2S gas has been reduced to a safe level (i.e., less than 10 parts per million [ppm]).

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

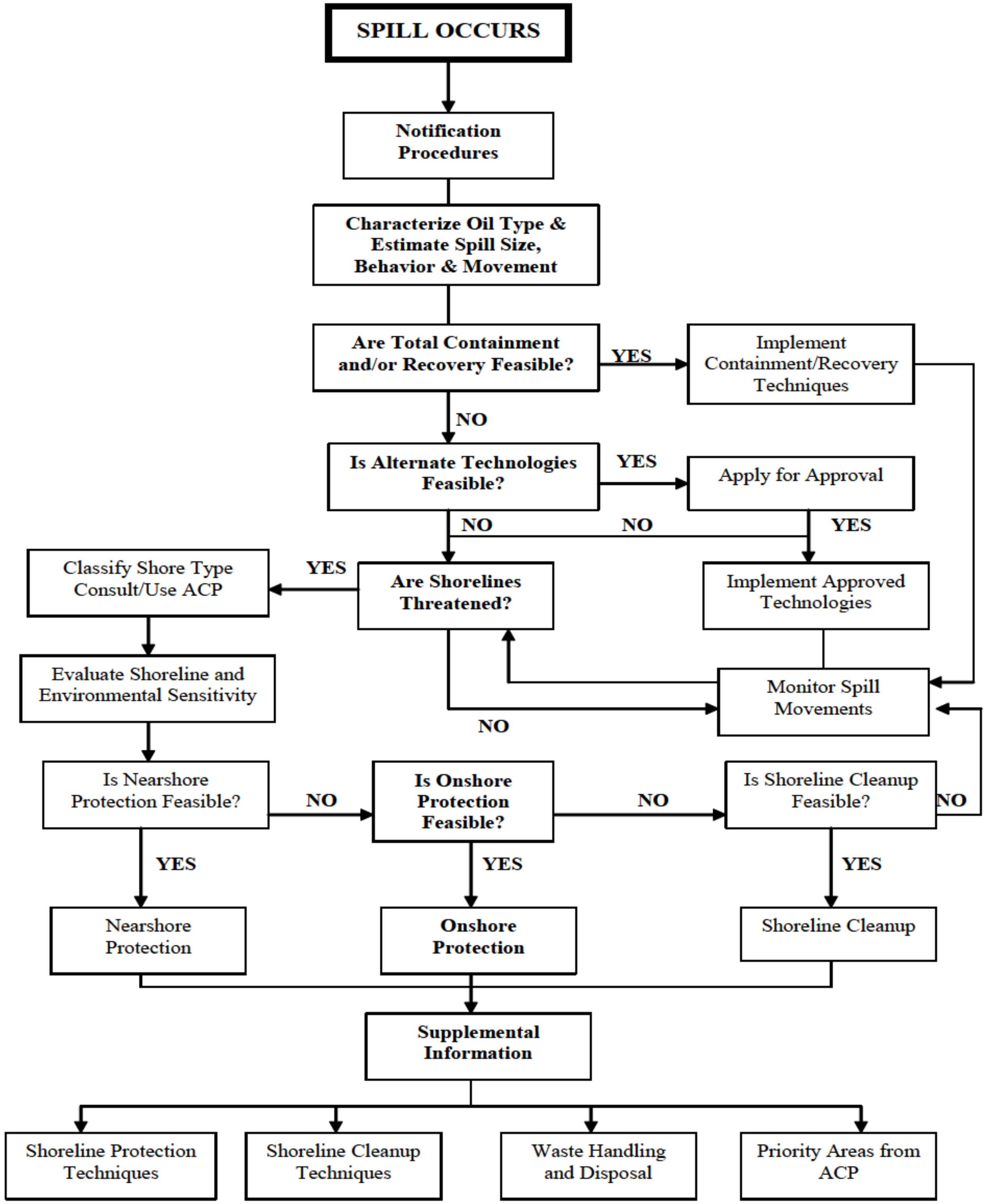
Protection Priorities

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 following guidelines and the Protection Guides 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 and Unified Command.

2. Cleanup techniques that dislodge intertidal vegetation and associated invertebrates will be avoided, unless specifically approved by government agencies and Unified Command.

3. Cleanup activities within marshes or vegetated shorelines will be avoided, unless specifically approved by government agencies and Unified Command.

4. Unaffected areas adjacent to shoreline cleanup areas will be boomed off to protect them from oiling during treatment operations.

5. Impact to lower intertidal areas that are productive and not oiled will be minimized.

6. Sorbents will be deployed below oiled upper beach faces to protect the lower intertidal zone from oiling.

7. All signs of human activity will be removed upon completion of cleanup.

All post-emergency response cleanup activities by HECO will be in accordance with those given in an approved Incident Action Plan. The Shoreline Countermeasures Manual and Matrices, presented in Section 3200 of the HACP, should be consulted in determining appropriate shoreline cleanup techniques.

Oil Spill Categorization

When conducting an assessment of the magnitude of an oil spill, the Utility Operator or Incident Commander will consider the following:

- Spill Volume
- Slick Size
- Wind
- Tides/Currents
- Oil Type
- Environmental Sensitivities
- Local Capabilities

In consideration of these criteria, oil spill categories are listed in Table 1.6-1 below. These categories are not intended to preclude logical judgements made by a competent individual at the time of a spill. In addition, it is common for responders to underestimate the magnitude of a spill at the onset. Therefore, assessments and estimations should error on the conservative side.

Table 1.6-1
Oil Spill Categorization

	Minor Spill	Medium Spill	Major Spill
Spill Volume	≤ 1,000 gallons confined to tank farm, or ≤ 1 barrel (bbl) to water	> 1,000 but ≤ 100,000 gallons confined to tank farm, or > 1 but ≤ 50 bbls to water	> 100,000 gallons confined to tank farm, or >50 bbls to water
Slick Size	≤ 100 square feet on water	> 100 but ≤ 10,000 square feet on water	> 10,000 square feet on water
Wind	Light wind (calm)	Winds ≤10 knots	Wind > 10 knots
Tides/ Currents	Slack tide, little current	Tide/current likely to move slick only a short distance, or toward acceptable collection point	Tide/current likely to move and spread slick extensively
Oil Type	All oils	All oils	All oils
Environmental Sensitivities	None at risk	Potential risk to sensitive areas	High risk of impact to sensitive areas
Local Capabilities	Contained and recovered with local capabilities	CIC Assistance required, possible mobilization of HECO Spill Management Team	CIC, NRC Environmental and HECO Spill Management Team assistance required

Initial Response Actions – Minor Spills

Aquatic

In the event of a minor aquatic spill, the HECO Incident Commander will activate Clean Islands Council. The following procedures will apply:

1. Complete steps identified in the Emergency Action Checklist (see Section 1.1).

2. For minor spills emanating from the Kahe Generating Station or Kahe Pipeline, Clean Islands Council will:

   - Launch response boat and containment boom, and deploy boom.
   - Deploy additional boom behind the containment boom already in place to ensure oil does not escape where required.
   - Deploy skimmer at downstream corner of containment area to recover floating oil and use sorbent pads for sheen recovery.
   - Maintain cleanup operations until demobilized by HECO.

3. For other minor spills (uncontained):

   - Alert CIC immediately. Request additional equipment and personnel if available containment and recovery equipment may not be sufficient.
   - 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 CIC to implement containment and recovery operations (see Section 1.6.5) to control remaining oil or protection operations per the HACP if it appears oil cannot be contained prior to contacting a sensitive area (see Section 1.6.6).
   - Utilize primary response or other 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 cleaned 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 as outlined in the Emergency Action Checklist (see Section 1.1).

3. Block storm drains and/or close Safe-Drain® valves.

4. 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 – Medium to Major Spills

If a medium or major spill occurs, the Incident Commander will immediately request the assistance of the HECO Spill Management Team and primary response contractors (e.g., Clean Islands Council and NRC Environmental). The initial response actions to be taken for medium to 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 as outlined in the Emergency Action Checklist (see Section 1.1).

3. Block storm drains and/or close Safe-Drain® valves.

4. Initiate slick surveillance and tracking procedures.

5. Request assistance from HECO Spill Management Team and primary response and other contractors, as necessary (see Section 1.2).

6. Initiate slick surveillance and tracking procedures (see Section 1.6.3).

7. 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).

8. 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).

9. If the spill is not continuing, recover the contained oil as soon as possible by skimming or vacuuming (see Section 1.6.5) and deploy additional boom to contain additional oil or protect sensitive areas as outlined in the HACP Geographic Annex (see Section 1.6.6 and GRP).

10. Estimate the probable spill trajectory (see Section 1.6.3) and identify the sensitive areas at risk (see Section 1.6.6) per the HACP Geographic Annex.

11. Using the HACP Geographic Annex, determine a strategy for exclusionary, diversionary, and collection booming.

12. Continue to monitor spill movement and begin developing an overall spill response plan in conjunction with the FOSC/SOSC.

13. Set up interim waste storage sites and begin making arrangements for waste characterization and disposal (see Section 1.7 and Appendix C).

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 or facility if extreme fire or explosion hazard exists; notify local police, fire department, and HECO Spill Response Team (see Section 1.3.3).

4. If safe, stop the flow of oil at the source as outlined in the Emergency Action Checklist (see Section 1.1).

5. If spill is outside the tank farm 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. Construct earthen berms in the north or south drainage culverts to block the flow of oil into the ocean. Take necessary steps to prevent oil from entering the water (see Section 1.6.5).

6. Request assistance from HECO Spill Management Team and primary response (i.e., Clean Islands Council) and other contractors (i.e., NRC Environmental) as needed (see Section 1.2).

7. Begin recovering contained oil immediately by pumping, using vacuum trucks and/or sorbents to minimize penetration into the substrate (see Section 1.6.5).

8. Set up interim waste storage site(s) and begin making arrangements for waste characterization and disposal (see Section 1.7 and Appendix C).

Major Spill Plan Implementation

In the event of a major spill, HECO will implement this FSRP to the full extent including the activation of the HECO 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 – The Hawaii Oil Spill Response Center is the primary location for 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. 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 FSRP 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 may be issued to all response workers but with an easily identifiable differentiation between HECO 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) may be consulted to assist in these arrangements. Section 3.5 contains a listing of local resources.
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.
6. Government and Public Liaison – Establish a plan and designate personnel to coordinate and maintain communications with response contractors, government agencies, 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. Section 2400 of the HACP provides additional information on Public Affairs.
8. Equipment Staging Area(s) – Establish areas at Clean Islands Council's facilities and the Coast Guard base at Sand Island. Additional information is provided in Section 1.6.4 and Section 5030 of the HACP.

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 local USCG base or air station, and the National Weather Service (see Section 1.2). Wind conditions are nearly always calm in the morning and pick up in the afternoon. The wind typically dies down again by late afternoon or evening. Kona (south) winds come from the opposite direction from the trade winds and usually indicate bad weather such as a storm.

Temperature can be determined using an outdoor thermometer or by calling the local weather service or airport. Temperatures above 80 to 90° F are of concern to oil spill response operations. Temperatures above this range can adversely affect productivity and the health and safety of response personnel. Temperatures on Oahu average 71°F during winter months to 78°F in the summer. Trade winds provide nearly constant breezes coming from the northeast at about 5 to 15 miles per hour. Oahu receives a variety of precipitation. Mountain areas may receive up to 300 inches of rainfall annually, while Honolulu receives only about 13 inches. Because Kahe is on the leeward side of the island, trade winds and rainfall are less prominent.

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 coconut into the water upstream, and timing how long it takes the stick/coconut to traverse the 100-foot area. The direction of stick/coconut 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/coconut 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)
- 1.0 knots = 60 seconds/100 feet (1.67 fps)
- 1.5 knots = 40 seconds/100 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. 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.

In the event of a spill, HECO Spill Management Team will assess the potential impact of weather using National Weather Service (973-5286) forecasts for regional information, local forecasts from the USCG, internet and/or actual field weather conditions.

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

- www.hawaiiweathertoday.com/
- www.prh.noaa.gov/pr/hnl/
- www.weather.com

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 to estimate the volume of a spill from the appearance of the slick. However, the appearance of oil on water also varies with the oil type, thickness, and ambient light conditions. 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 oil.

Metallic: The oil is visible with a metallic or reflective appearance; it will still have traces of the rainbow colors at the edges.

Dark (or True) Color: Fresh oil after the initial spreading will have a black, very dark brown or the actual (true) color of the product. 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 1.6-2 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.	Bbl/Sq. Nm.
Sheen (silver or with colors)	0.0003	0.000066	6.3
Metallic Colors	0.002	0.00044	42.0
Dark Color	0.1	0.022	2,100.0
Mousse (note: 30% oil)	1.0	0.066	6,300.0

Example

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.

Figure 1.6-2
Volume Estimates Based on Appearance of Slick

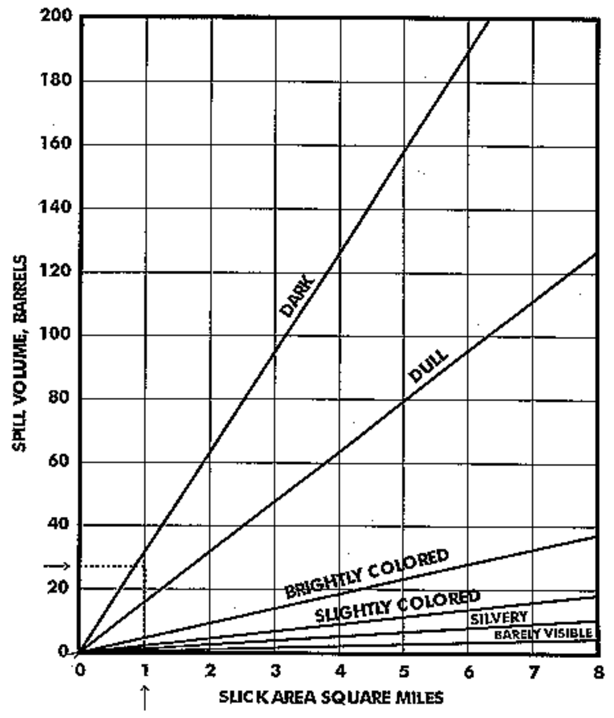


Figure 1.6-3
Oil Slick Volume Estimator

DEFINITIONS	GALLONS OF OIL PER SQUARE MILE
barely visible	25
silvery	50
slightly colored	100
brightly colored	200
dull	666
dark	1332

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. = 3.96 gallons; round off to 4 gallons
Area Two Volume	= 200 yds. x 60 yds. x 0.022 gal. sq. yd. = 264 gallons
Total Volume	= Area One + Area Two = 4 + 264 = 268 gallons
Volume in Barrels	= 268/42 = 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

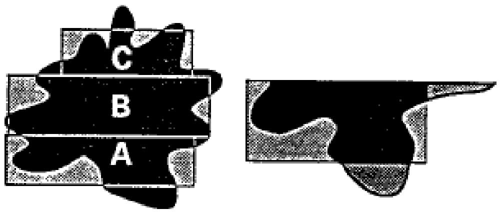
The surface of spilled oil is usually so irregular that it is extremely difficult to estimate the area covered. The problem can be simplified if the spill area is first separately divided into two main types of areas:

<u>Flow Areas</u>
Area covered by oil flow with little or no penetration.

<u>Pooling Areas</u>
Area where oil has pooled after flowing, allowing penetration to occur.

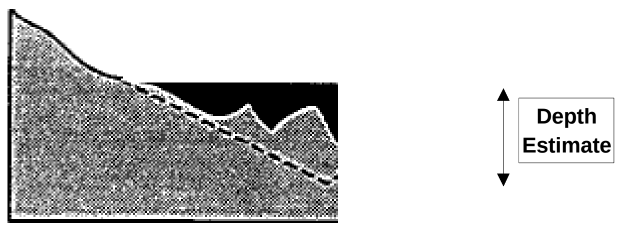
<u>Converting Irregular Shapes (Simpson's Rule)</u>

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" 60' x 10' = 600 square feet Area "B" 65' x 12' = 780 square feet Area "C" 40' x 10' = 400 square feet **1,780 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. 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.

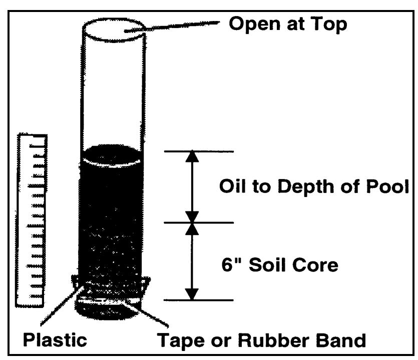
150 barrels x 1.03 = 154.5
6,300 gallons x 1.03 = 6,489 gallons

- 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 settle 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/π = 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:

Area = πr^2
A = 3.14 x 301 x 301
= 284,487 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 = πr2 = (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. Representatives from the National Oceanic and Atmospheric Administration (NOAA) provide trajectory modeling capabilities during spill response.

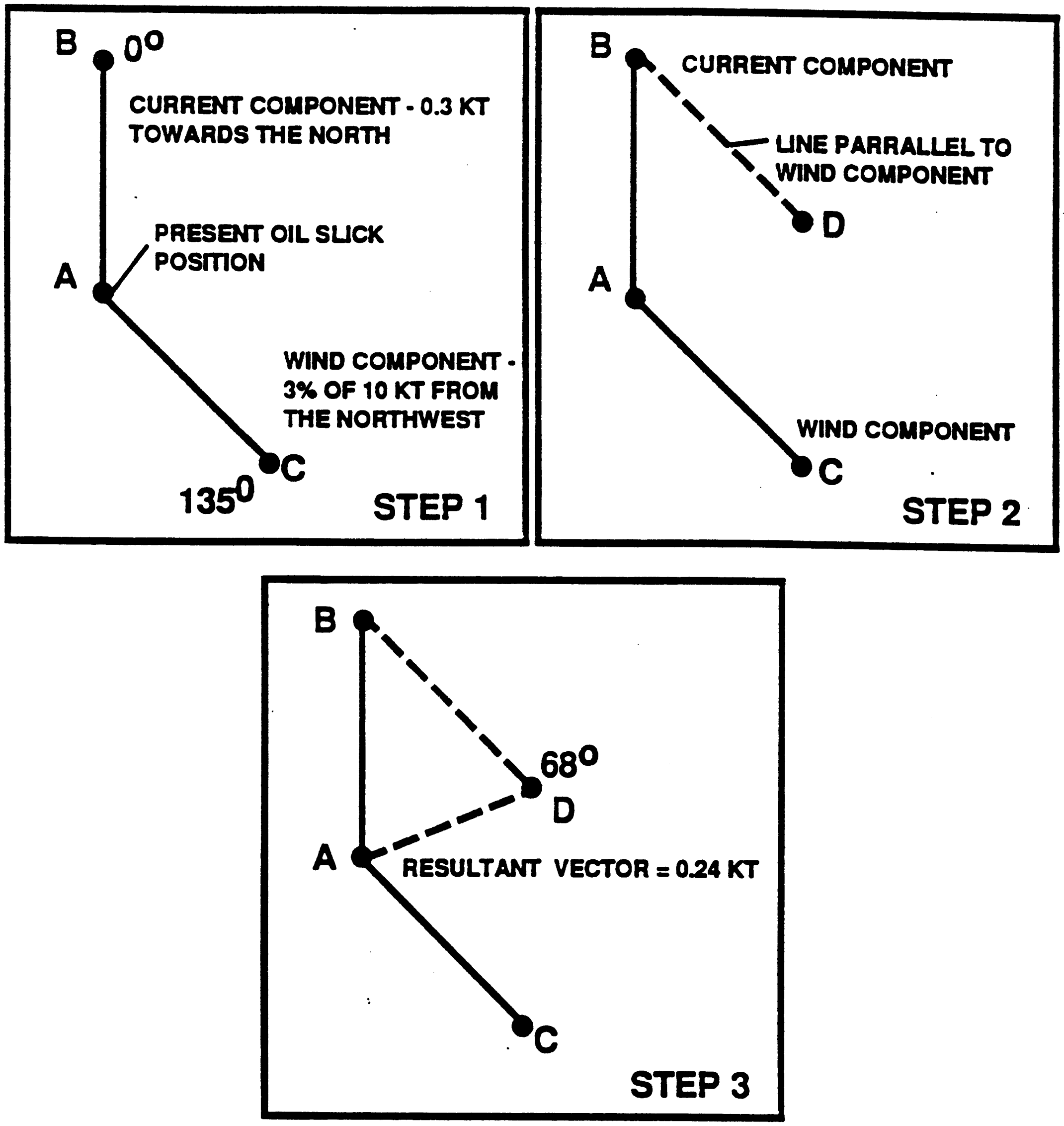
Visual

The Shift Supervisor 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-wing aircraft.

Vector Addition 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.

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 to the 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 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.

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 are listed in Section 3.5 (Table 3.5-2).

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. Additional information is provided in Section 5050 of the HACP.

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.

Kahe Generating Station

Command/Communications Post

In the event of a spill, the central Command/Communications Post for the Kahe Generating Sta6tion will be located at the main office. If the size of the incident requires additional space, the Command Post may be moved to Hawaii Oil Spill Center. This facility provides adequate area, resources, communications, etc., to accommodate the State Incident Command or State/Federal Unified Command as well as HECO's Spill Management Team.

Staging Areas

The Kahe Generating Station has designated equipment and personnel staging areas. Staging areas provide access to the spill area, as well as easy deployment of oil containment booms.

- The first staging area is located at the facility.
- The second staging area is located at the intake basin.
- The third staging area is located at the Deep Draft Harbor.

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.

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

Selection of an appropriate aquatic containment and recovery technique depends on a number of factors include:

- Current Speed – Surface currents >1 knot can cause boom failure or entrainment 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.

The protection strategy for the Kahe intake, and maps showing environmental sensitivities are presented in Section 2.1 and the HACP Geographic Annex.

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.	<u>Equipment</u> 1 – Backhoe, bulldozer, front-end loader, or set of hand tools. <u>Personnel</u> 4 – 8 workers	• Steep slopes • Porous substrate	• Disturbance to surface soils and vegetation • Increased oil penetration
B. Storm Drain Blocking	Block drain opening with sediments, plastic sheet, boards, etc., and secure to prevent oil from entering drain.	<u>Equipment</u> Misc. hand tools; 1 – Board, plastic sheet, mat, etc. <u>Personnel</u> 1 – 2 workers	• May be advantageous for oil to enter drain • Heavy precipitation	• Increased oil penetration • 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.	<u>Equipment</u> 1 – Backhoe, bulldozer, front-end loader, or set of hand tools. <u>Personnel</u> 4 – 6 workers	• Upstream storage capacity • Flowing water	• Increased oil penetration
D. Culvert Blocking	Block culvert opening with plywood, sediments, sandbags, etc. to prevent oil from entering culvert.	<u>Equipment</u> Misc. – Hand tools; Misc. – plywood, sandbags, etc. <u>Personnel</u> 3 – 4 workers	• Upstream storage capacity • 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.	<u>Equipment</u> 1 – Backhoe, set of hand tools Misc. – plastic sheeting or plywood/ sheet material <u>Personnel</u> 3 – 6 workers	• Slope • Depth to near-surface flow	• Increased oil penetration • Disturbance to surface soils and vegetation

(1) In addition to implementation time and accessibility

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				
F. Shoreline Containment Booming	Deploy boom around point of oil entry into water and anchor to shoreline on either side.	Equipment 1 – Boat 100 feet – boom (min.) 3 – Anchor systems (min.) Personnel 2 – 3 workers	• Currents > 1 to 2 knots • Waves > 1 to 2 feet • Water depths > 50 feet	• Minor disturbance to substrate at anchor points • Heavy oiling of shoreline within booms and associated impacts
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 2 – Boats 200 feet of Boom (min.) Misc. – Tow lines, connectors, bridles, etc. Personnel 4 workers + boat crew	• Waves > 1 to 2 feet • High winds • 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 1– Boat, vehicle or winch 1 to 2 Booms (1.2 channel width ea.) 2 to 10 – Anchor systems Personnel 2 – 3 workers	• Currents > 2 to 3 knots • Water depths > 50 feet (anchoring) • Sensitive shorelines	• Minor substrate disturbance at anchor points • Heavy shoreline oiling at downstream anchor point

(1) In addition to implementation time and accessibility

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)				
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) 1 – Boat 20 – Fence posts 200 feet – Wire mesh 200 sq. feet – Sorbents Misc. – Hand tools, fasteners, support lines, additional stakes, etc. Personnel 2 – 3 workers	• Water depths > 5 to 10 feet • Currents > 0.5 knots • Soft substrate	• Minor substrate disturbance at post and shoreline anchor points • 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) 200 feet – Boom (min.) *2 – Boats* *Misc. – Tow lines, connectors, bridles, etc.* Equipment (Portable) 50 feet – Hoses (min.) *1 – Pump (if required)* *500 gallons – Storage (min.)* Personnel 4 workers + boat crew	• Waves > 0.5 to 1 foot • High winds • Currents > 2 knots	• No significant effects

(1) In addition to implementation time and accessibility

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 Misc. – Sorbents, bags or containers for oiled sorbents Personnel 1 – 10 workers	• Very light or weathered oil coatings/sheens • Steep or slippery shorelines	• Significant substrate disturbance • Foot traffic can trample vegetation/crush organisms • 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, HECO 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.

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.

<u>Technique Selection</u>

The primary factors influencing terrestrial containment and recovery are:

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

1.6.6 Sensitive Area Protection

In the event of an aquatic spill from the Kahe Generating Station or Kahe 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. Terrestrial spills are not considered in this section. 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.

The common protection techniques are summarized in Table 1.6-4. 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 1.6.3]) can also be used for protection purposes.

Identification of Sensitive Areas

As discussed in Section 3.8, *Response Planning Standards and Scenarios,* spill planning distances for the Kahe Generating Station are 20 miles northwest along the coast to Kaena Point. These distances are based upon those requirements outlined by the EPA. Sensitive areas in the vicinity of the Kahe Generating Station and Pipeline include marine mammals, coral reefs, parks, sea turtles,

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) 1 – Boat 6 – Anchor systems 750 feet – Boom (min.) Personnel 3 workers + boat crew	• Currents > 1 to 2 knots • Waves > 1 to 2 feet • 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 1 – Boat 3 – Anchor systems (min.) 100 feet – Boom (min.) Personnel 3 workers + boat crew	• Currents > 2 to 3 knots • Waves > 1 to 2 feet • Water depth > 50 feet (anchoring) • Sensitive shorelines	• Minor substrate disturbance at anchoring points • 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 1 – Boat 5 – Anchor systems 200 feet – Boom Personnel 3 workers + boat crew	• Currents > 2 to 3 knots • Waves > 1 to 2 feet • Water depth > 50 feet (anchoring) • Onshore winds	• Minor substrate disturbance at anchoring points • 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 1 – Backhoe, bulldozer, front-end loader, or set of hand tools 1 – Plastic sheeting roll Personnel 2 – 6 workers	• Water outflow • Inlet depth > 5 feet • Excessive inlet width	• Sediment/vegetation distur-bance at borrow areas • Inlet substrate disturbance • Increased suspended sediments • 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, HECO 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 subsistence fishing, cultural resources and the plant's water intake. Descriptions of areas that may be vulnerable to a potential spill from the Kahe Generating Station and Pipeline are provided in Section 3.2, Hazard Evaluation. These include:

- Water intakes
- Residential areas
- Schools
- Medical facilities
- Business
- Lakes and streams
- Fish and wildlife
- Wetlands and other sensitive environments
- Endangered Flora and Fauna
- Recreational areas
- Utilities
- Transportation routes (air, land and water)

Maps showing sensitive resources are presented in Section 2.1 of this FSRP and in the HACP Geographical Annex.

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. HECO will support these efforts and supply equipment as requested through the Unified Command.

The National Marine Fisheries Services (NMFS) is responsible for management of marine mammals. The Hawaii Department of Land and Natural Resources – Division of Forestry and Wildlife (DFW) is responsible for the management of wildlife and coordination of wildlife rehabilitation. It should be anticipated that each of these agencies will provide information concerning their specialties through the NRDA team.

HECO recognizes that the rehabilitation of oiled wildlife is a specialized activity and will call upon the services of the International Bird Rescue Research Center (IBRRC) 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 HECO's ability to collect information should a spill occur.

1.6.8 In Situ Burning and Dispersant Application

The HECO 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 Clean Islands Council and NRC Environmental.

While Hawaii State policy currently allows dispersant application and in situ burning in certain areas, these technologies are not likely to be effective with the types of oil handled at the Kahe Generating Station. Section 4530 of the HACP contains the details for the use of Alternative Response Technologies in Hawaii, including State and Federal pre-approval and a dispersant use checklist.

Table 1.6-5
Data Sheet for Collection of Live Oiled 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 Oiled 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

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 Kahe Generating Station or Pipeline could involve fuel oil (i.e., LSFO), biofuel or diesel fuel. Recovered oil would be stored in bulk tanks, tank trucks, or barges until the oil can be recycled, or disposed.

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 significant amounts of oily water would be recovered.

The largest fuel oil tank at the Kahe Generating Station may contain up to [redacted] (b) (7)(F), (b) (3) gallons). For planning purposes, it will be assumed that 100 percent of this tank spills necessitating [redacted] (b) (7)(F), (b) of temporary storage capacity. The volume of contaminated sorbents, PPE, and other oiled solids would be significant with a spill of this magnitude. For planning purposes, the volume of oiled solid material is estimated at 5,000 cubic yards.

In addition to tankage at other HECO facilities, HECO maintains additional interim storage capacity (for recovered liquids) available under contract in the local area as follows:

- Clean Islands Council 2,878 bbls
- Marine Logistics 186 bbls
- Pacific Environmental Corp. 1,263 bbls

Barges:

- Holo Kai 32,000 bbls
- Hui Mana 40,000 bbls
- Huna Kai 53,000 bbls

Chevron, Tesoro or another HECO facility may provide at least one bulk storage tank during a worst-case scenario. Tank selection will be based on the most available tank (e.g., tank with the lowest amount of stored product). Bulk storage tanks can handle between 176,000 and 300,000 barrels each.

Tesoro Hawaii Corporation
91-235 Komohana St.
Ewa Beach, Hawaii
Contact: VP Refining
Phone: (808) 547-3912

Chevron USA Hawaiian Refinery
91-480 Malakole St.
Ewa Beach, Hawaii
Contact: Refinery Manager
Phone: (808) 682-5711

The following procedures shall be followed during an oil spill cleanup.

- Report to the HECO Incident Commander.
- Evaluate the volume of material to be handled.
- Ensure that the material is stored properly.
- Arrange to collect representative samples of oil and oiled waste materials to be characterized.
- Deliver representative samples to laboratory for characterization.
- Make preliminary contacts with listed recyclers and waste disposal sites to determine their acceptance criteria and availability.

1.7.1 Disposal Plan

Kahe's waste disposal plan is included as Appendix C. Section 3240 of the HACP also establishes oily waste disposal guidelines. The plan is designed to accelerate the waste disposal procedure during a spill response. HECO will work closely with DOH 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.

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 operation section chief to understand the requirements.

As oil is recovered, it should be placed in sealable containers such as five-gallon cans with lids or caps, 55-gallon drums, portable tanks, tank trucks, or any other container that can be sealed to prevent spillage. At the Shift Supervisor's discretion, recovered product may be pumped back into sound tanks of compatible material at the facility.

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. For persistent oils such as those handled at the Kahe Generating Station or Pipeline, interim storage should be sufficient to keep up with recovery operations and handle the entire volume of oil recovered and oily wastes generated.

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. The Department of Health has agreed upon minimum standards necessary for shoreside temporary storage of oily waste. For specific guidance and concurrence of Solid Waste Management, call DOH at (808) 586-4240. The primary objective of a cleanup activity is to remove the oiled debris from the impacted shoreline. If transportation problems necessitate temporary storage, then the following applies:

- The primary method of storage should be in roll off dumpsters. These dumpsters should be lined and covered as is the standard industry practice.
- An alternative method is to prepare an area by lining it with two layers of 6 mil plastic. If there is a significant amount of oil that may drip from the material, then the plastic should be covered with sorbent rug.
- The area must be secured and access must be restricted.
- Ingress and egress areas for heavy equipment must be maintained in a fashion which does not compromise the integrity of the liner.
- Consideration must be given to covering the material to prevent excessive rain water from accumulation in the bermed area. This may also be required if the debris may be blown by strong winds.
- Temporary storage areas will be situated onshore near the impacted area. These areas will be designated as satellite storage areas where the waste will be staged prior to transfer to either disposal or centralized storage. Department of Health personnel will assist in locating the appropriate area taking into consideration access and other concerns. As soon as possible after the shoreline area has been cleaned and no further impact is expected, the oily waste should be moved to the centralized storage area.

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).

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

- Local geology
- Soil type
- Proximity to groundwater/surface water
- Flooding potential
- Availability of cover material (if any)
- 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 Appendix C.

The following wastes may be generated during the response to an oil spill:

- Oil (refined petroleum product, LSFO or diesel)
- Oil and seawater mixture
- Oil and freshwater mixture
- Oil saturated booms/absorbent pads
- Oil-contaminated debris, e.g., palm fronds, plants, trash, etc.
- Petroleum contaminated soil and sand
- Oil contaminated wildlife (dead)

Quantities of each will vary depending on location of spill, size, and type of petroleum product.

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 production and 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 vessel 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 sands, 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. The initial inquiry into classifying an unusable or spent material is to determine whether it is a "solid waste." Per RCRA Hazardous waste rules, a material is defined as hazardous for one of two reasons:

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

A solid waste is any discarded material that is not specifically excluded by federal regulations and is abandoned, recycled, or inherently waste-like. Abandoned materials considered to be solid wastes include materials which are disposed of, burned/incinerated, or otherwise accumulated, stored, or treated. Recycled materials are considered solid wastes if they are used in a manner constituting disposal or burned for energy recovery. It is important to note that a waste does not have to be in a physically solid state to meet the definition of a "solid" waste.

Solid wastes include the following:

- Garbage
- Solids
- Refuse
- Liquids
- Sludge
- Semi-solids
- Containerized gas

If the material to be disposed of is not one of the above, it is probably not considered a solid waste. If the material is a solid waste, it should then be further classified as either a hazardous or a non-hazardous waste.

After the material is considered a solid waste, it is a hazardous waste if:

- It is not specifically excluded from regulation as hazardous wastes;
- It is considered to be "listed waste," which are wastes listed by RCRA as hazardous waste and must always be managed as hazardous waste;
- It possesses one or more of the following hazardous characteristics: (1) ignitability, (2) corrosivity, (3) reactivity, and (4) toxicity;
- It is a mixture of a solid waste (non-hazardous) and one or more of the listed hazardous wastes; and
- It is a solid waste derived from the treatment, storage, or disposal of a hazardous waste.

If the waste does not meet the above criteria, than it is considered a non-hazardous waste. Due to the properties of the virgin products stored at Kahe and transferred though the pipeline, it is unlikely that the waste generated will be hazardous.

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 1.7-1 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. It is very important to keep track of the volume of each type of waste generated during response operations.

Table 1.7-1
Oily Waste Segregation

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

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.

1.7.5 Waste Disposal

It is HECO's policy that oily waste should be disposed of in the most efficient and environmentally sound manner.

Incineration at H-Power is the preferred site for oily waste disposal on or near Oahu. Capacity or operational constraints may limit disposal of oily waste at H-Power.

The Waste Management Specialist should take the following factors into consideration:

- quantity of waste
- capacity of treatment/disposal options
- adequacy of temporary storage
- time requirements of treatment/disposal options
- effectiveness of treatment/disposal
- costs

The Area Committee has established the following hierarchy for disposal of oily waste:

- Incineration at H-Power (Oahu spills)
- Landfilling
- Bioremediation at Off-Site Facilities
- In-Situ Burning
- Refining

<u>Incineration at H-Power</u>

It has been agreed that H-Power will accept oily waste as a result of an emergency situation. Specific details regarding the approval are presented in Section 3240 of the HACP. H-Power can process approximately 50 to 100 tons of oily waste per day. The following types of oily waste can be handled:

- Oil absorbent polypropylene material (cut into three foot segments and removal of all metal parts
- Litter and other small debris (small debris are generally anything less than 3"x4"x36")

Contact the following for incineration:

H-Power
Covanta Honolulu
91-174 Hanua Street
Kapolei, HI
Phone: 808-682-2099

Landfilling

For debris which is not acceptable for burning at H-Power other means of treatment, in a reasonable time and cost, it is agreed these materials may be disposed of at a lined landfill:

- Litter
- Green waste
- Bulky materials

A list of the landfills on Oahu is provided in Table 1.7-2.

Bioremediation or In-Situ Burning

Consult with HECO's Environmental Department, these options will require detailed plans and may require special permits.

Refining

Both Chevron and Tesoro have the capabilities of re-refining recovered product. However, Chevron and Tesoro have conditions that must be met prior to acceptance of the product for re-refining. These conditions include:

- Age of the oil or oil-water mixture
- Identity of responsible party (owner of oil)
- Other potential contaminants.
- Volume

1.7.6 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 State Department of Transportation (DOT) specification 17E or 17H drums can be used for liquids having a flashpoint between 20°F and 73F, and a vapor pressure less than 18 psi absolute, at 100°F (40 CFR 119[1]). For loading solid materials that have a flashpoint form 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 HECO Waste Management Specialist will ensure that waste is transported under proper permits and labels/placards for transportation per Hazardous Waste Manifest and Transport guidelines.

Table 1.7-2
Oahu Landfills

Permit #	Facility Name	Facility Operator	Facility Description	Location/Island	Permit Status
LF0021-94	PVT Landfill	PVT Land Company	C&D LF	Nanakuli, Oahu	Permitted
SW-234242	Waimalano Gulch Landfill	Waste Management, Inc	MSWLF	Kapolei, Oahu	Permitted

1.7.7 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 transpiration 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 and DOH.

A primary concern in handling recovered oil and oil solid wastes is to prevent oiling of previously unaffected areas or re-oiling of area 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.

1.7.8 Decanting

Decanting is the process of draining off recovered water from portable tanks, internal tanks, collection wells or other storage containers to increase the available storage capacity of recovered oil. When decanting is conducted properly most of the water can be removed from the collected petroleum.

During spill response operations, mechanical recovery of oil is often restricted by a number of factors, including the recovery system's oil/water recovery rate, the type of recovery system employed and the amount of tank space available on the recovery unit to hold recovered oil/water mixtures. In addition, the longer oil remains on or in the water, the more it mixes to form an emulsified mousse or highly mixed oily/water liquid, which sometimes contains as much as 70% water and 30% oil, thus consuming significantly more storage space.

In many cases, the separation of oil and water and discharge of excess water is necessary for skimming operations to be effective in maximizing the amount of oil recovered and in minimizing overall environmental damages. Such actions should be considered and in appropriate circumstances authorized by the FOSC and/or the SOSC because the discharged water will be less harmful to the environment than allowing the oil to remain in the water and be subject to spreading and weathering.

During a response, it may be necessary for HECO to request from the Federal and/or State OSC authority to decant while recovering oil so that response operations do not cease or become impaired. FOSC authorization is required in all cases and in addition SOSC authorization is required for decanting activities in state waters.

Expeditious review and approval, as appropriate, of such requests is necessary to ensure rapid and efficient recovery operation. The request, decision and to decant must be documented. The FOSC and/or SOSC will review and provide directions and authorization as appropriate to the request.

The following criteria should be considered when determining whether decanting is applicable, unless circumstances dictate otherwise:

- All decanting should be done in a designated "response area" within a collection area, vessel collection well, recovery belt, weir area, or directly in front of a recovery system.
- Vessels employing sweep booms with recovery pumps in the apex of the boom should decant forward of the recovery pump.
- All vessels, motor vehicles and other equipment not equipped with an oil/water separator should allow retention time for oil held in internal or portable tanks before decanting commences.
- A containment boom will be deployed around the collection area to minimize loss of the decanted oil or entrainment.
- Visual monitoring of the decanting area shall be maintained so that discharge of oil in the decanted water is detected promptly.
- Prior to using an uncleaned vacuum truck for the collection of oil, with subsequent decanting of water, a check of the containment tank is required to ensure there are not contaminates from previous activities and that the water is safe to discharge back into the environment. A chlorine test will be used for this purpose. A record of the test results will be retained as part of the incident disposal file.

Section 3240 of the HACP contains the complete decanting policy.

PART II
RESPONSE MANAGEMENT

HAWAIIAN ELECTRIC COMPANY, INC.
KAHE GENERATING STATION
KAHE PIPELINE
KAPOLEI, HAWAII

Submitted: May 2012

THIS PAGE INTENTIONALLY LEFT BLANK

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 choose 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.

THIS PAGE INTENTIONALLY LEFT BLANK

PART II
TABLE OF CONTENTS
RESPONSE MANAGEMENT

2.1 PROTECTIVE ACTION PROCEDURES

Sections 2.2 and 2.3 provide descriptions for the implementation of 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.

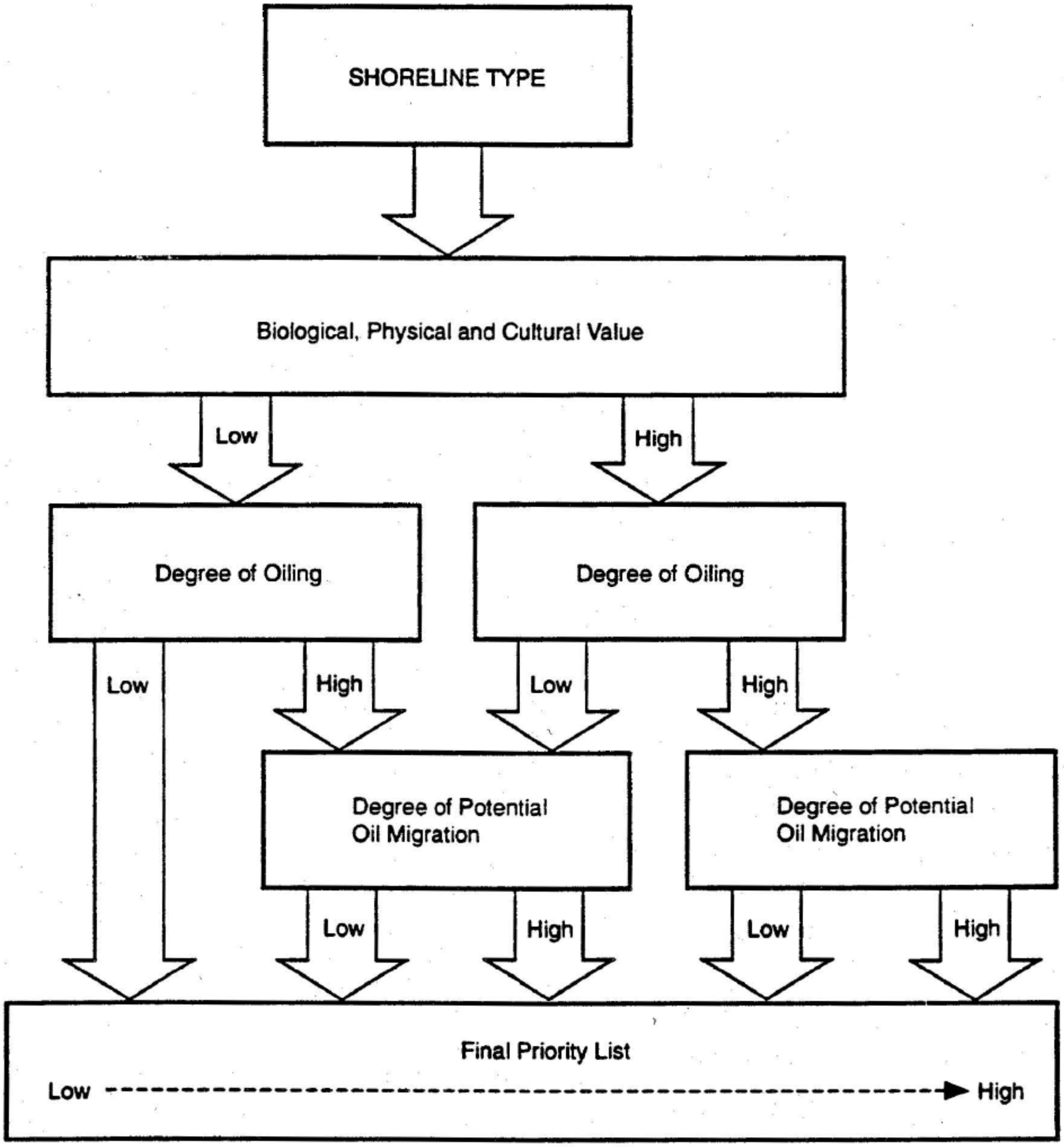
In cases where resources have already been impacted and continued oiling is anticipated, priority judgments become less clear. Generally, if a highly sensitive and/or vulnerable resource has been only lightly oiled, its normal response priority should be maintained. If such a resource has been heavily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

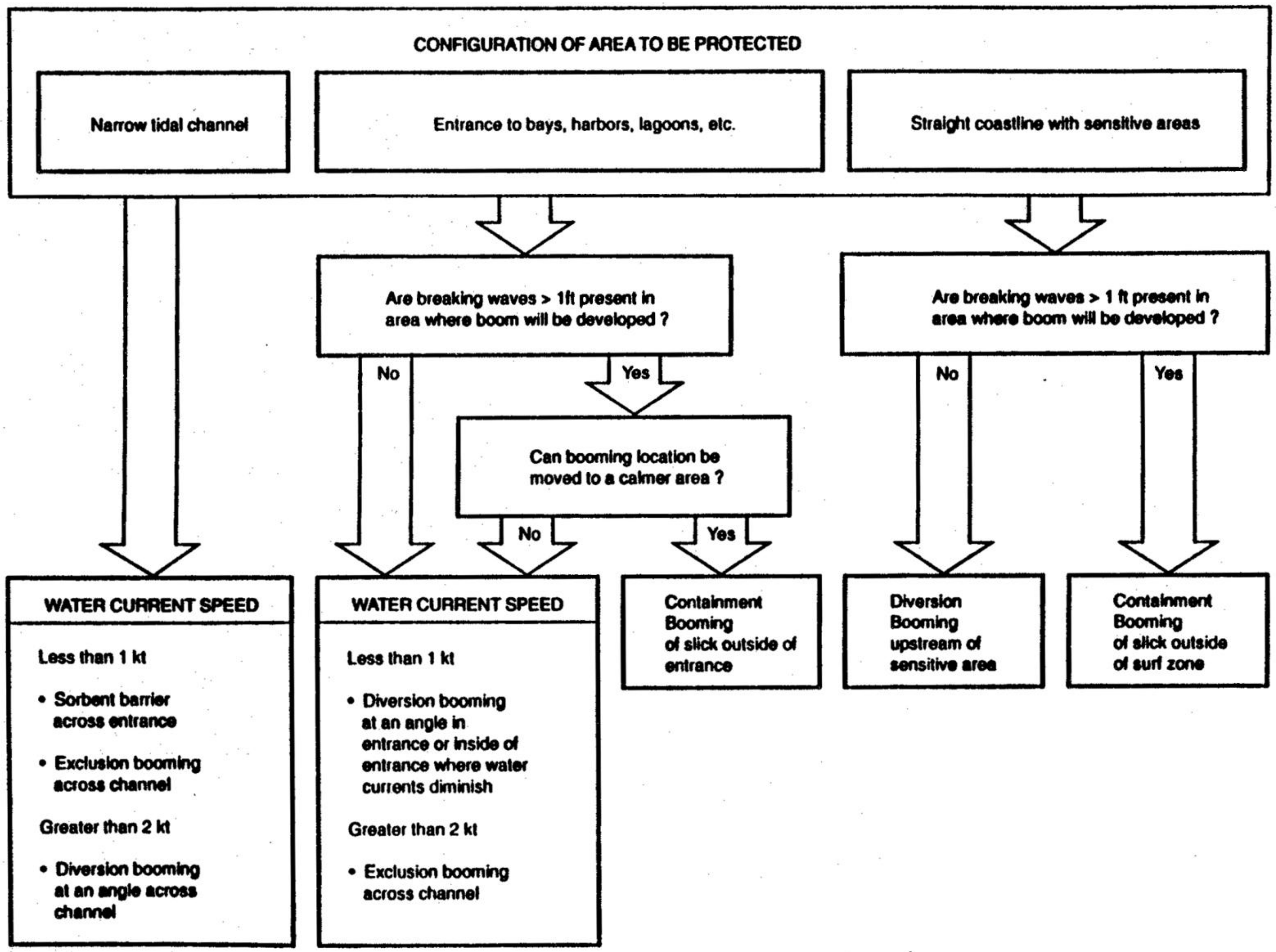
- For inland waters (Guide 2-3), enter the figure at the type of water body where protection is needed and select the appropriate booming technique(s) depending on the amount of oil contamination and the water current speed (except for shallow waters). For a large lake where water currents and/or waves are present, use the decision guide for coastal waters (Guide 2-2).

In any location (inland and coastal waters) where currents exceed three (3) knots or breaking waves are greater than one (1) foot, it is best to move the proposed boom location away from turbulent waters into a more quiescent area along the water body.

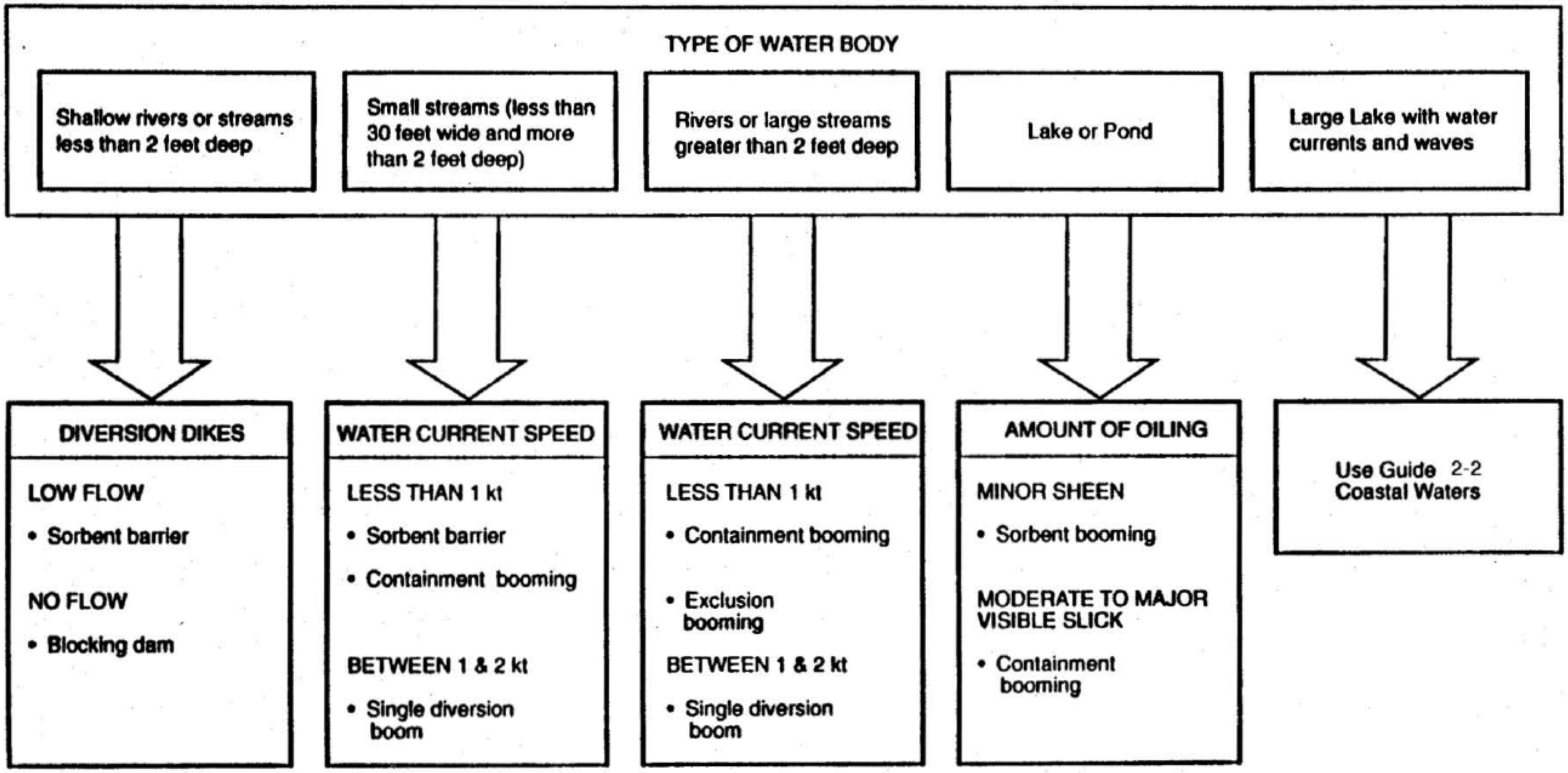
- For terrestrial areas, selection of appropriate protective techniques is dependent on the following factors:
  Nature of the substrate
  Slope of terrain
  Amount of oil
  Available time

Guide 2-2

Open (Coastal Waters)

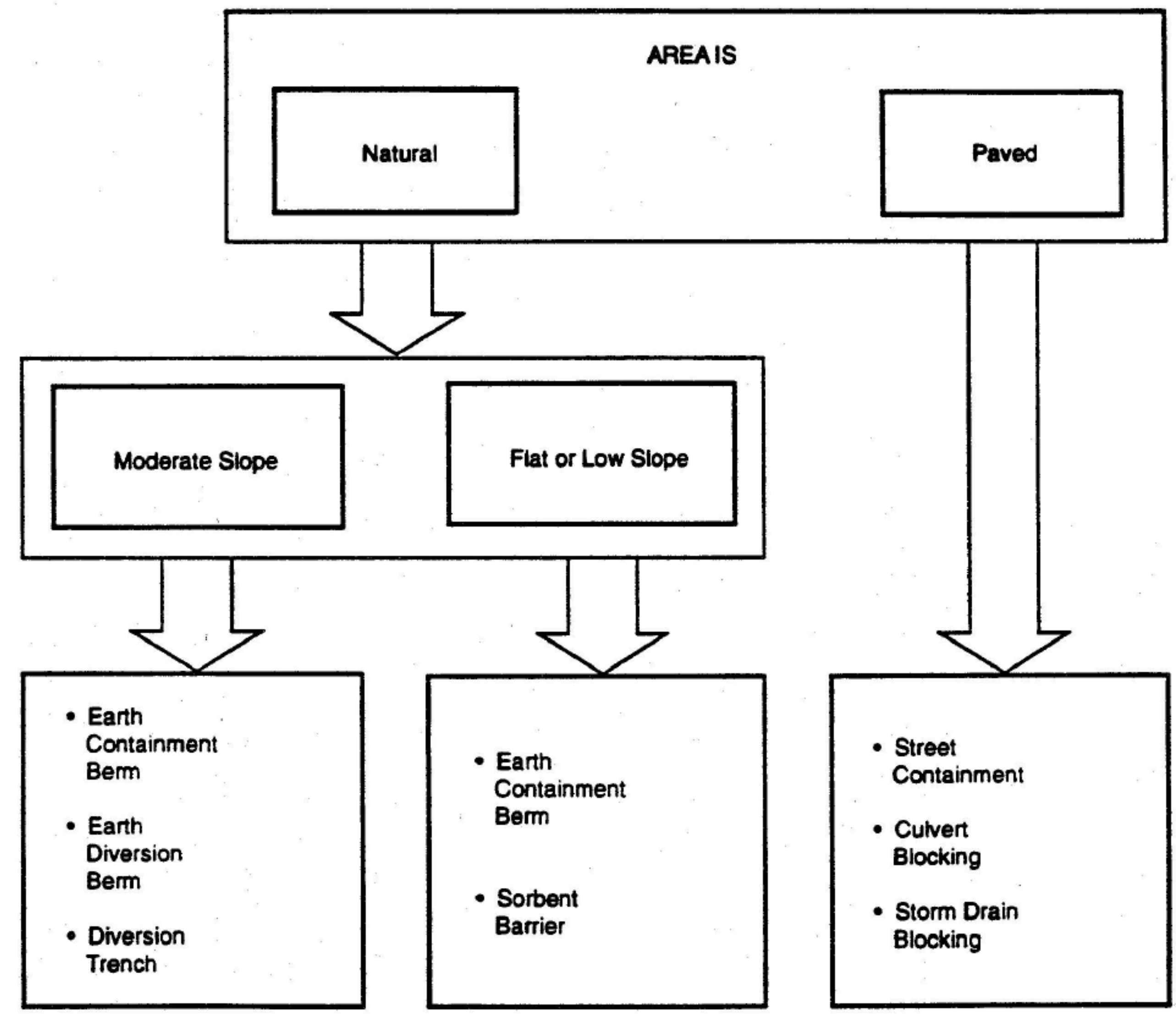


Guide 2-3
Inland Waters



Guide 2-4

Terrestrial Areas



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 Oahu Coast

The southwest coast of Oahu consists mainly of rocky headlands with intermittent mixed sand and gravel or fine-grained sand pocket beaches. There are also extensive near-shore shallow coral reefs and shoals.

The prevailing wind throughout the year is the northeast trade wind. The southwest Kona winds, which occur most frequently from October through August, can cause unsafe conditions for anchoring; however, weather severe enough to interfere with shipping or travel is uncommon. A tidal current floods west and eddies off the reef are reported to accompany the west flood. Strong west currents have been reported off the coast of Oahu.

Sensitive areas along the coast of Oahu include marine mammals, coral reefs, parks, sea turtles, subsistence fishing, cultural resources, and the plants water intake. Sensitive areas around the Kahe Generating Station are shown on Figures 2.1-1 through 2.1-7.

The OSRVs (Oil Spill Response Vessel) *Clean Islands* and *Hawaii Responder* are docked at Pier 35 in Honolulu Harbor. Additional emergency response trailers, skimmers and supplies are located at the Kahe Generating Station and the Sand Island Oil Spill Center. Equipment available for vessels of opportunity skimming systems (VOSS) are also located at the Sand Island Spill Center.

<u>Response Strategy Action Points</u>

In the event of a spill from the Kahe Generating Station or Pipeline, boom will be deployed to protect the intake structure. The pre-planned deployment strategy is illustrated on Figures 2.1-8 and 2.1-9. If the oil slick migrates to the south, HECO has developed a protection strategy for the Koolina and Ihilani resort area. The protection strategy is illustrated on Figure 2.1-10.

Figure 2.1-1

Honolulu/Kalaeloa Point, Oahu ***Kahe Point to Campbell Industrial Park***

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

[redacted]

Figure 2.1-2

Honolulu/Kalaeloa Point, Oahu *Nanakuli to Kahe Point*

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

[redacted]

Figure 2.1-3

Honolulu/Kalaeloa Point, Oahu *Maili Point to Nanakuli*

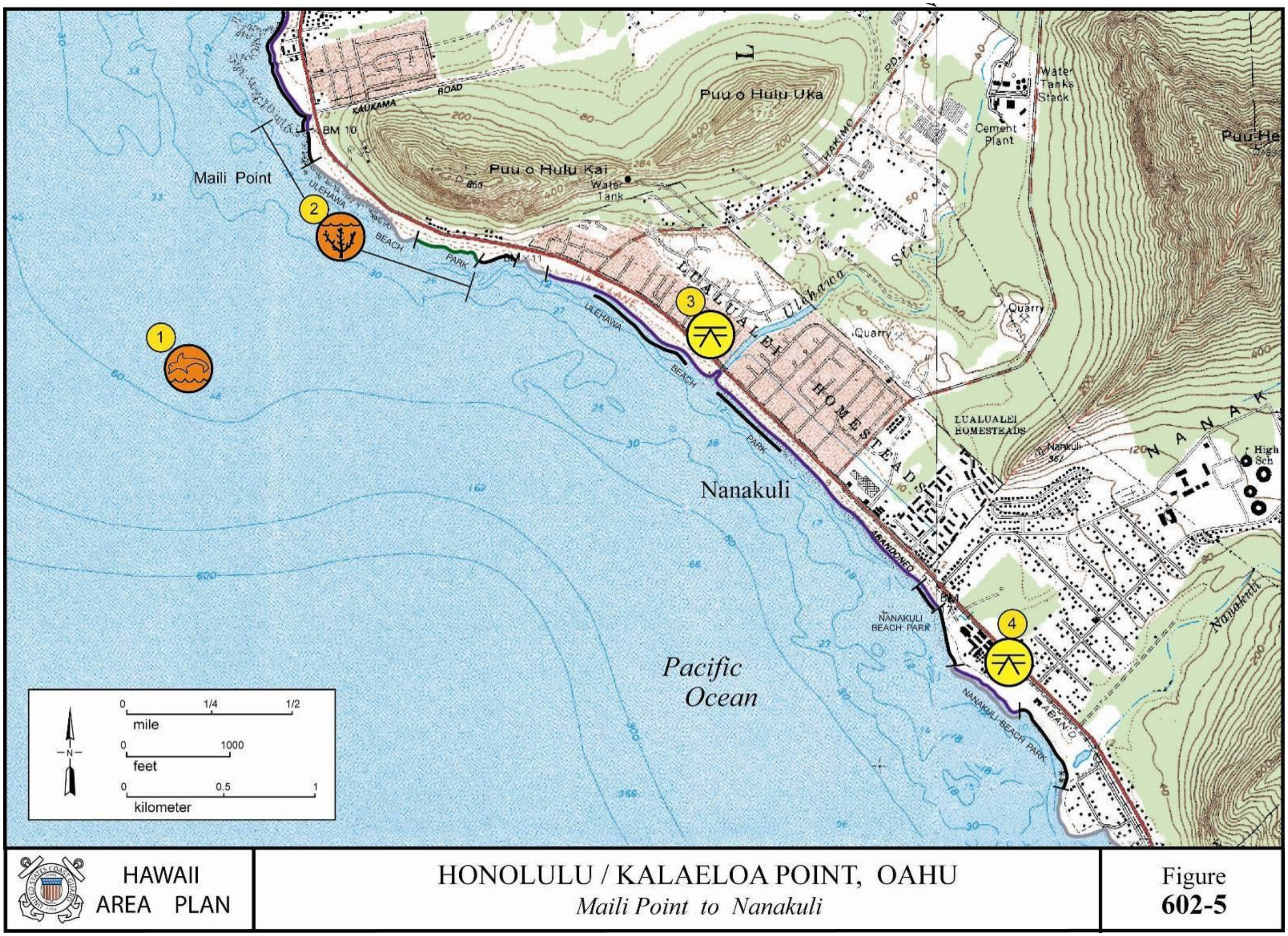


Figure 2.1-4

Honolulu/Kalaeloa Point, Oahu *Pokai Bay ot Maili Point*

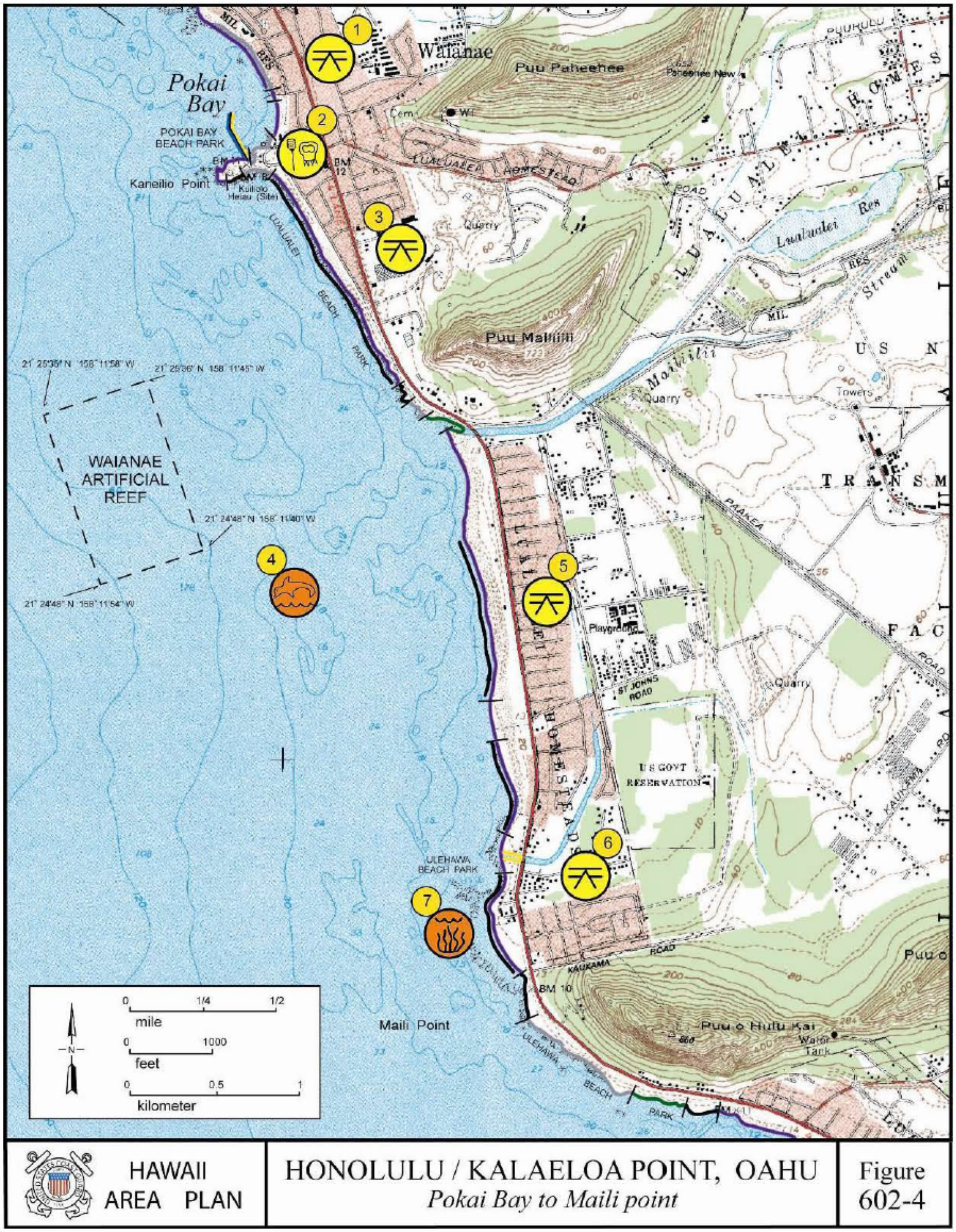


Figure 2.1-5

Honolulu/Kalaeloa Point, Oahu *Kepuhi Point to Pokai Bay*

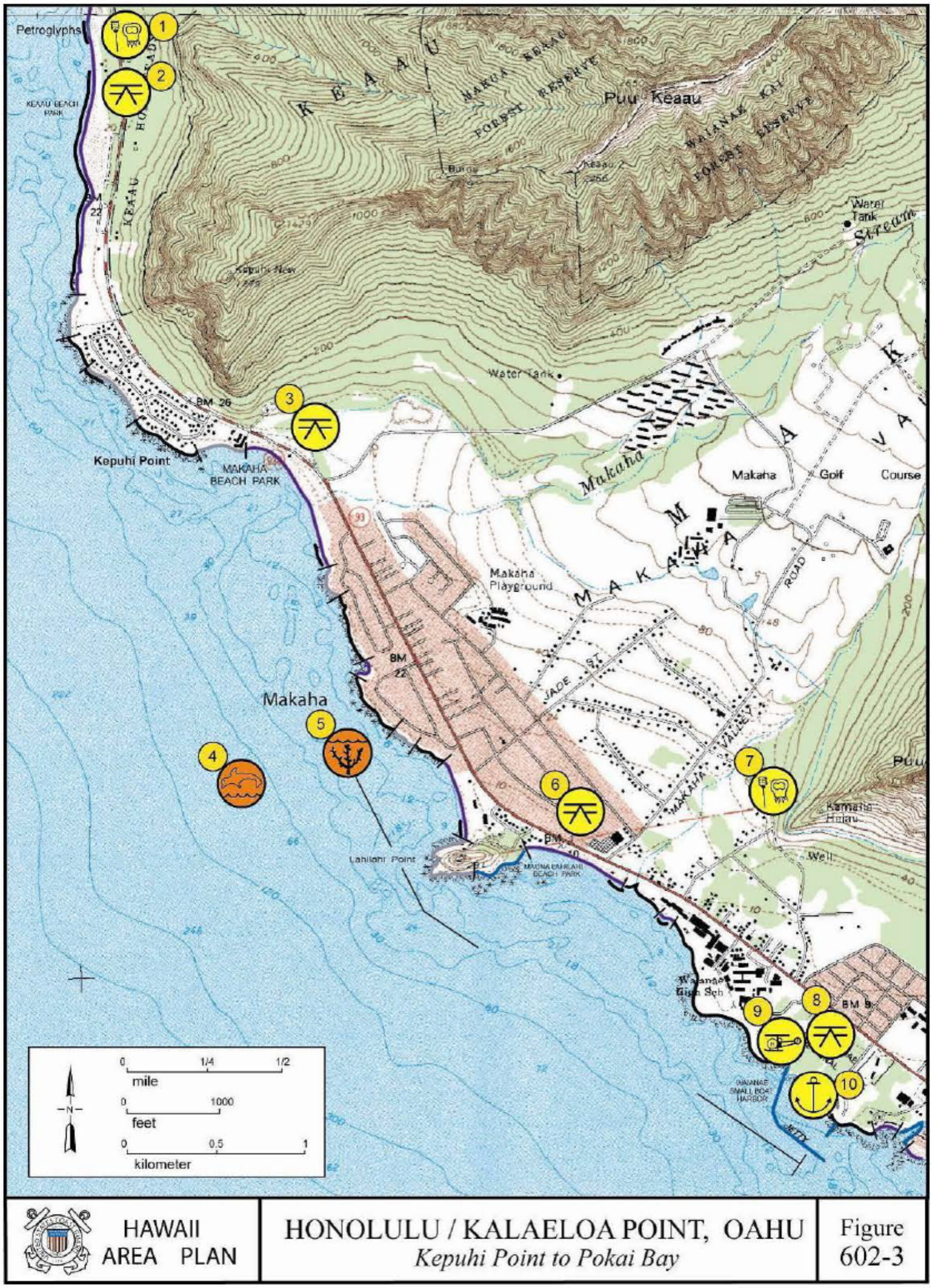


Figure 2.1-6

Honolulu/Kalaeloa Point, Oahu *Makua to Keaau*

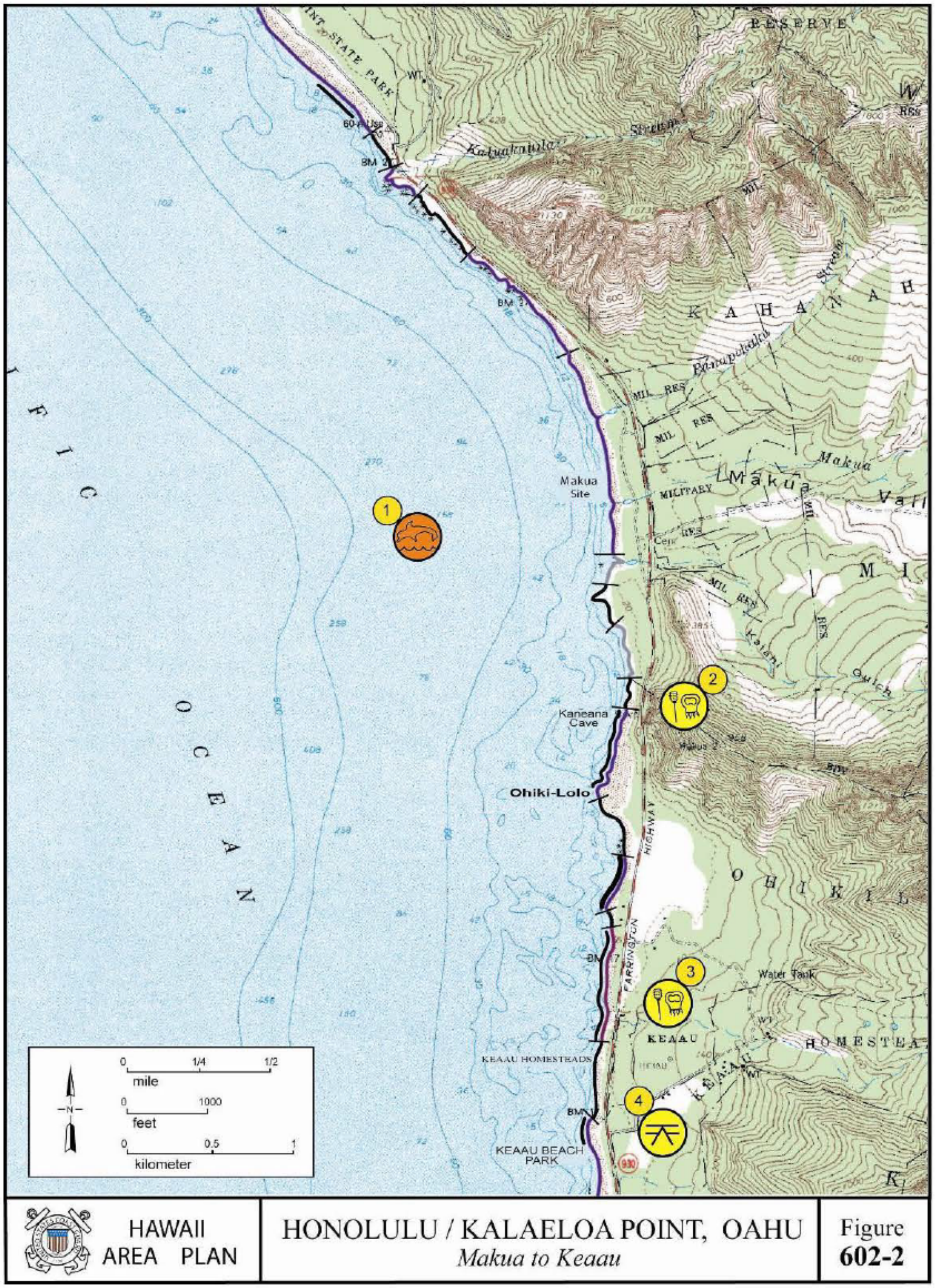
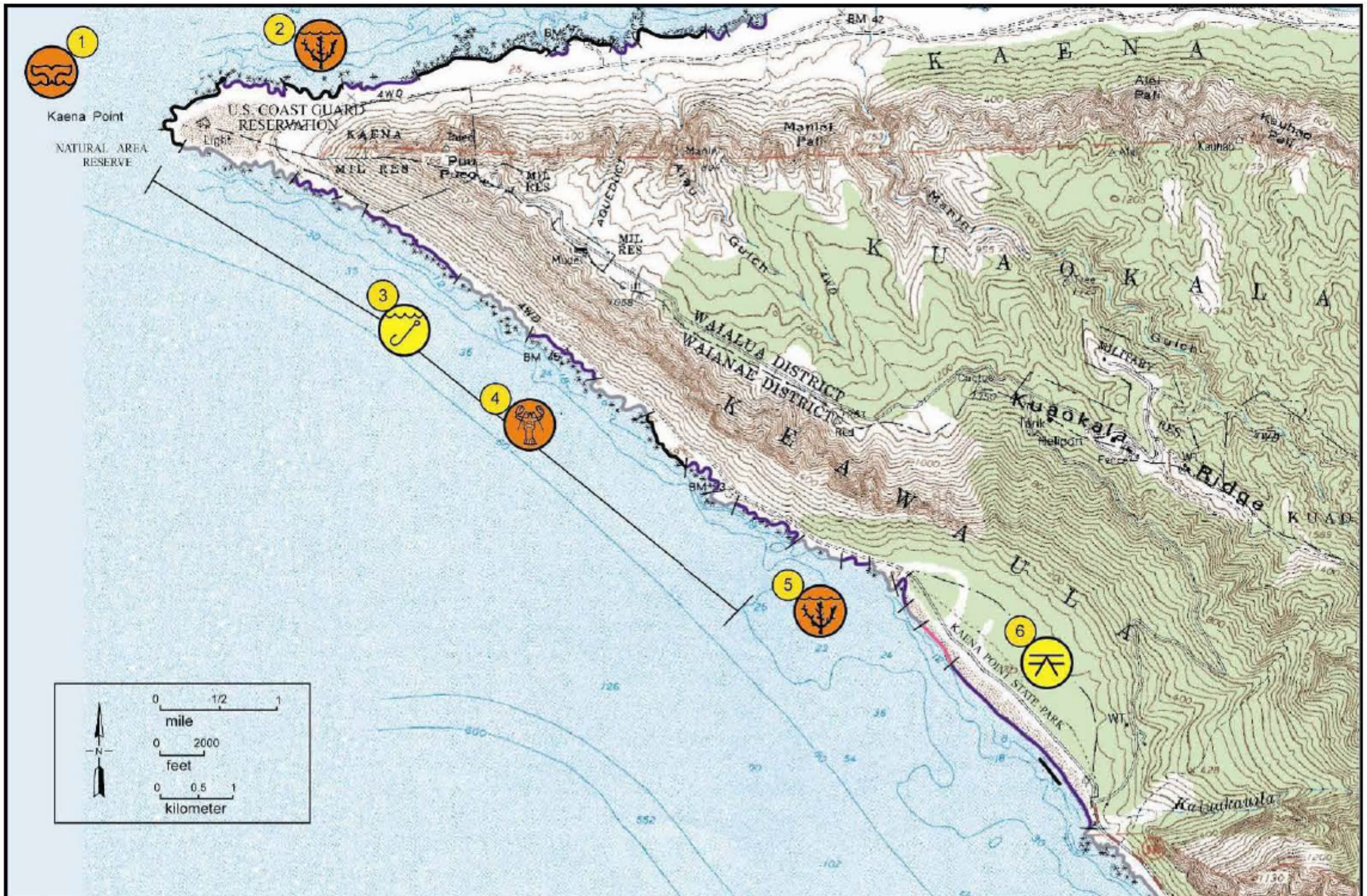


Figure 2.1-7

Honolulu/Kalaeloa Point, Oahu *Kaena Point and State Park*



HAWAII AREA PLAN	HONOLULU / KALAELOA POINT, OAHU *Kaena Point and State Park*	Figure **602-1**

Figure 2.1-6

Kahe Intake Structure Initial Response Strategy

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

[redacted]

Figure 2.1-7

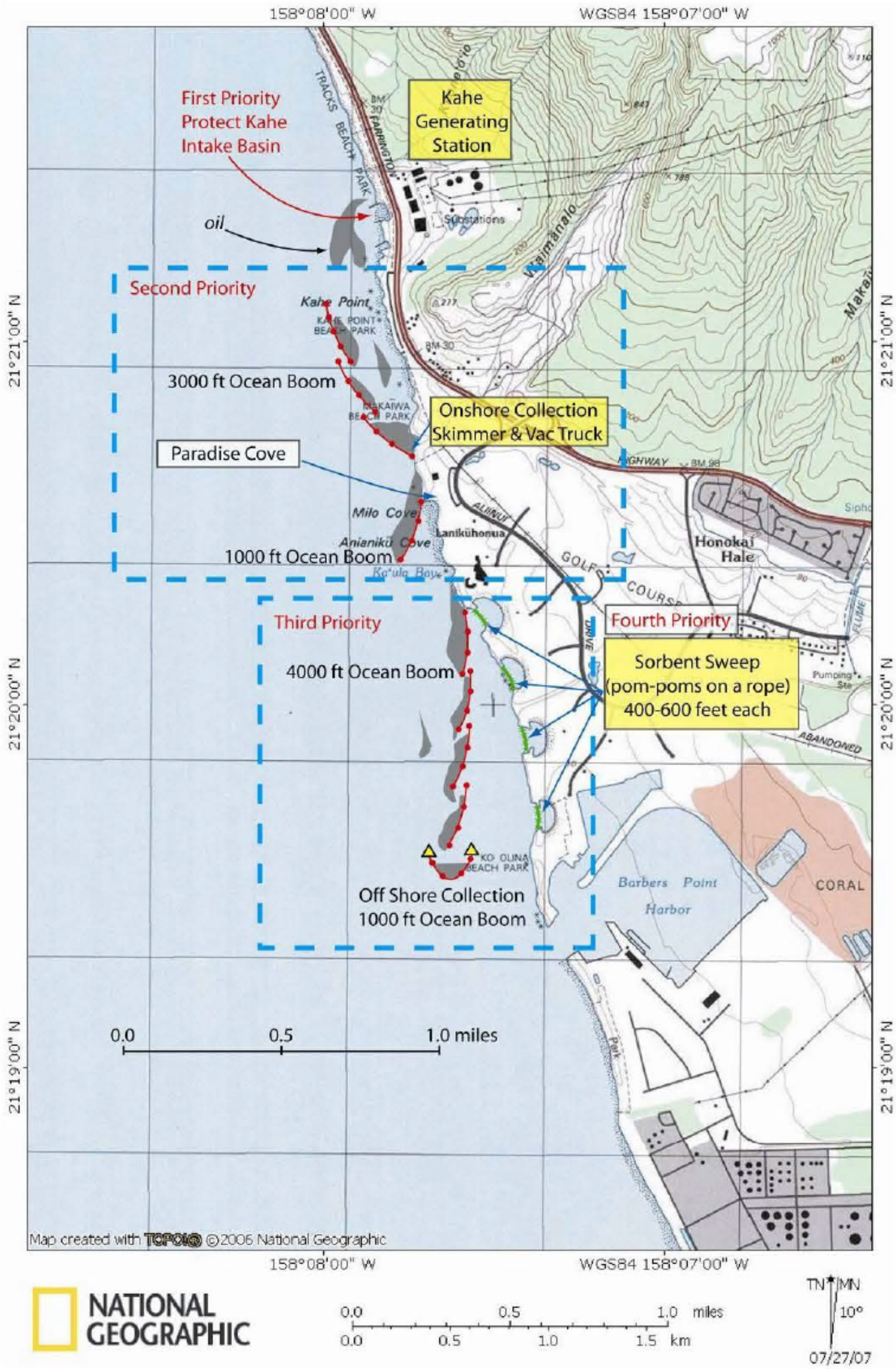
Kahe Intake Structure Initial Response Strategy

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

[redacted]

Figure 2.1-10

Koolina Protection Strategy



THIS PAGE INTENTIONALLY LEFT BLANK

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.

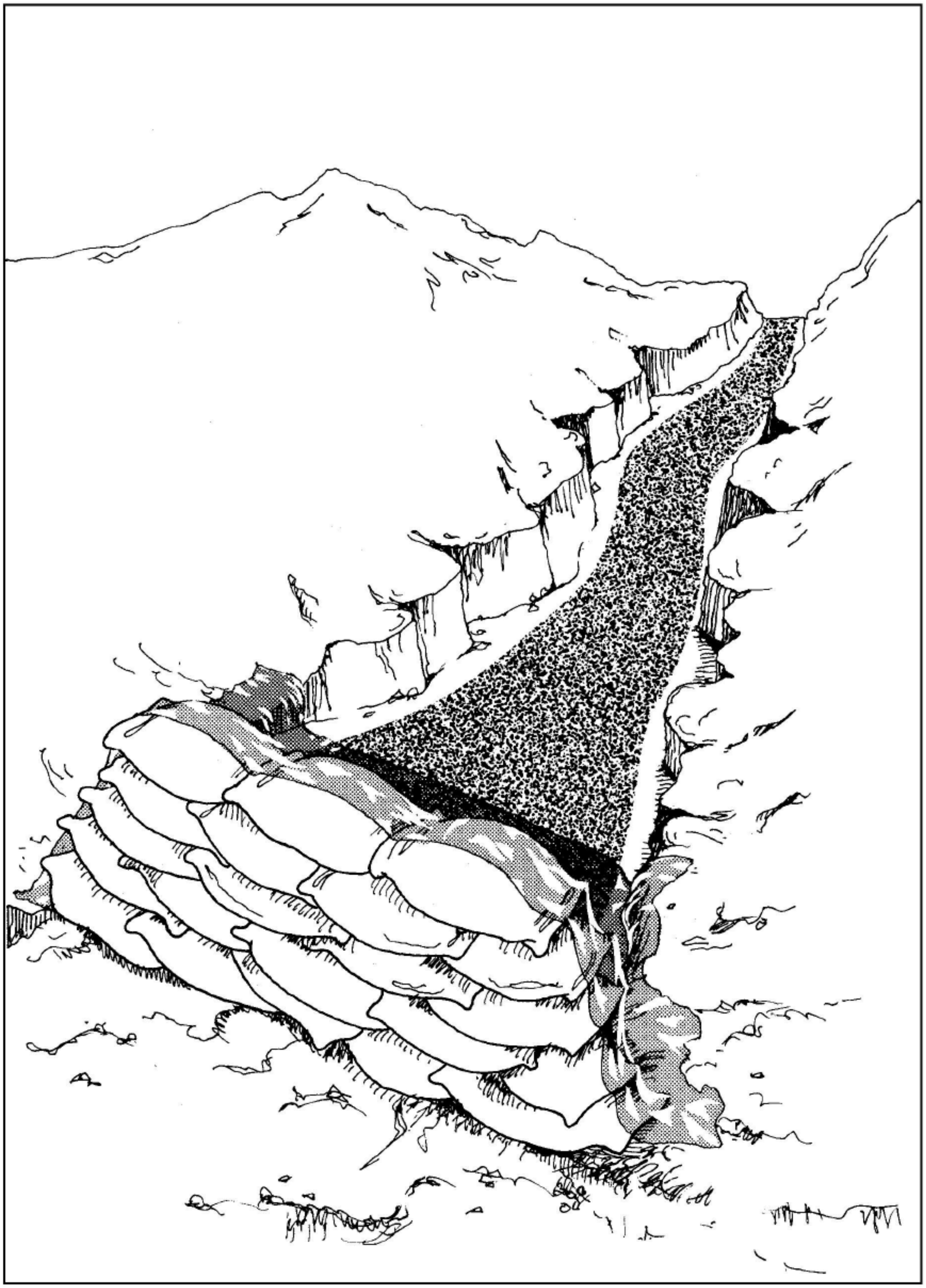
Maintenance. Periodically check the dam for leaks, structural integrity, and excessive oil buildup.

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.

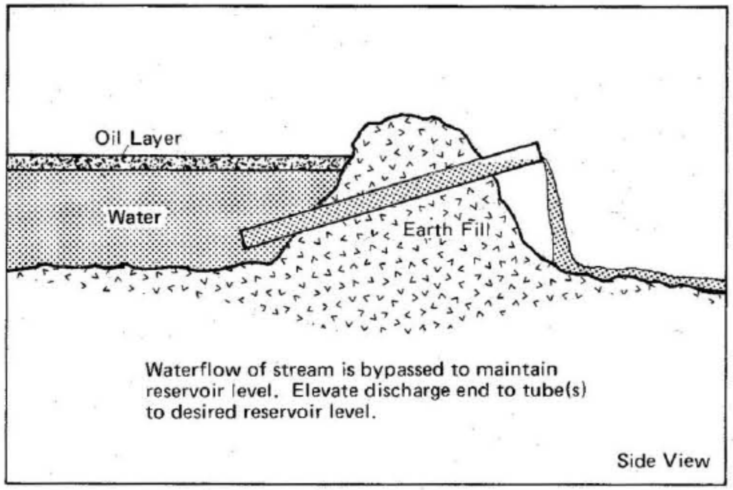
Equipment Required. Front-end loader, bulldozer, backhoe, pipes, pumps, hoses and hand tools.

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.

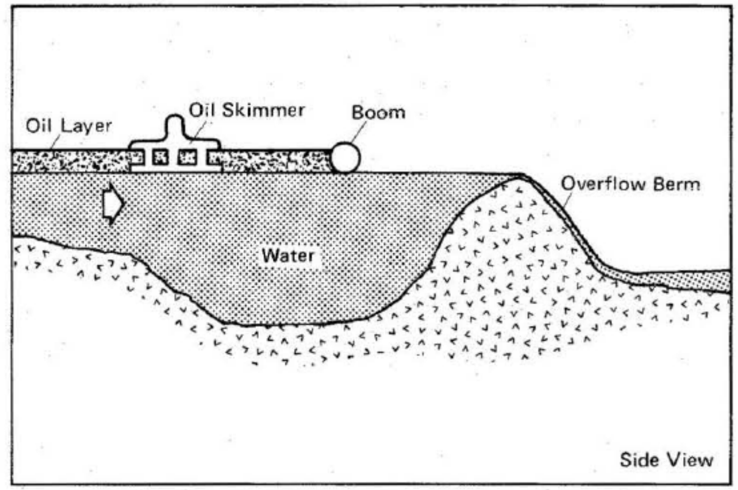
Cleanup. Remaining sheens are recovered with sorbents and dam materials are returned to borrow sites. Refer to Section 2.6 for shoreline cleanup techniques.

Variations. None.

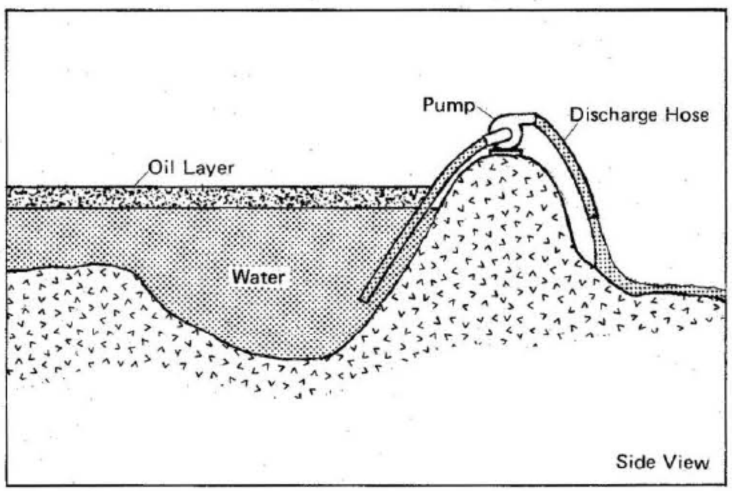
Figure 2.2-2
Flowing Water Dams



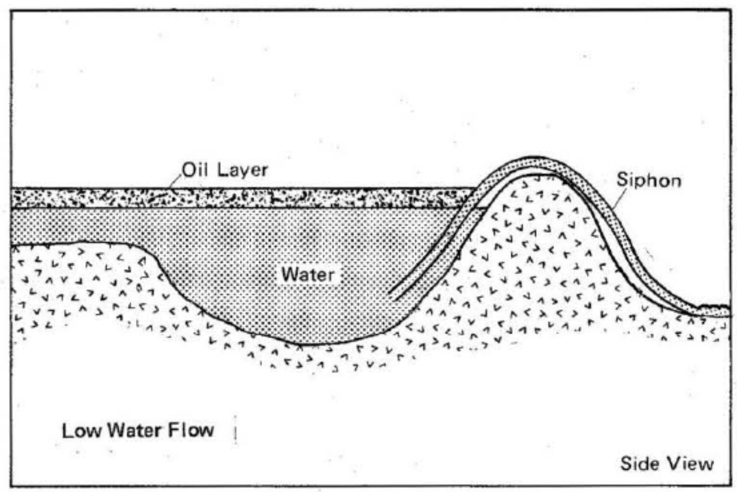
A. Underflow dam



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.

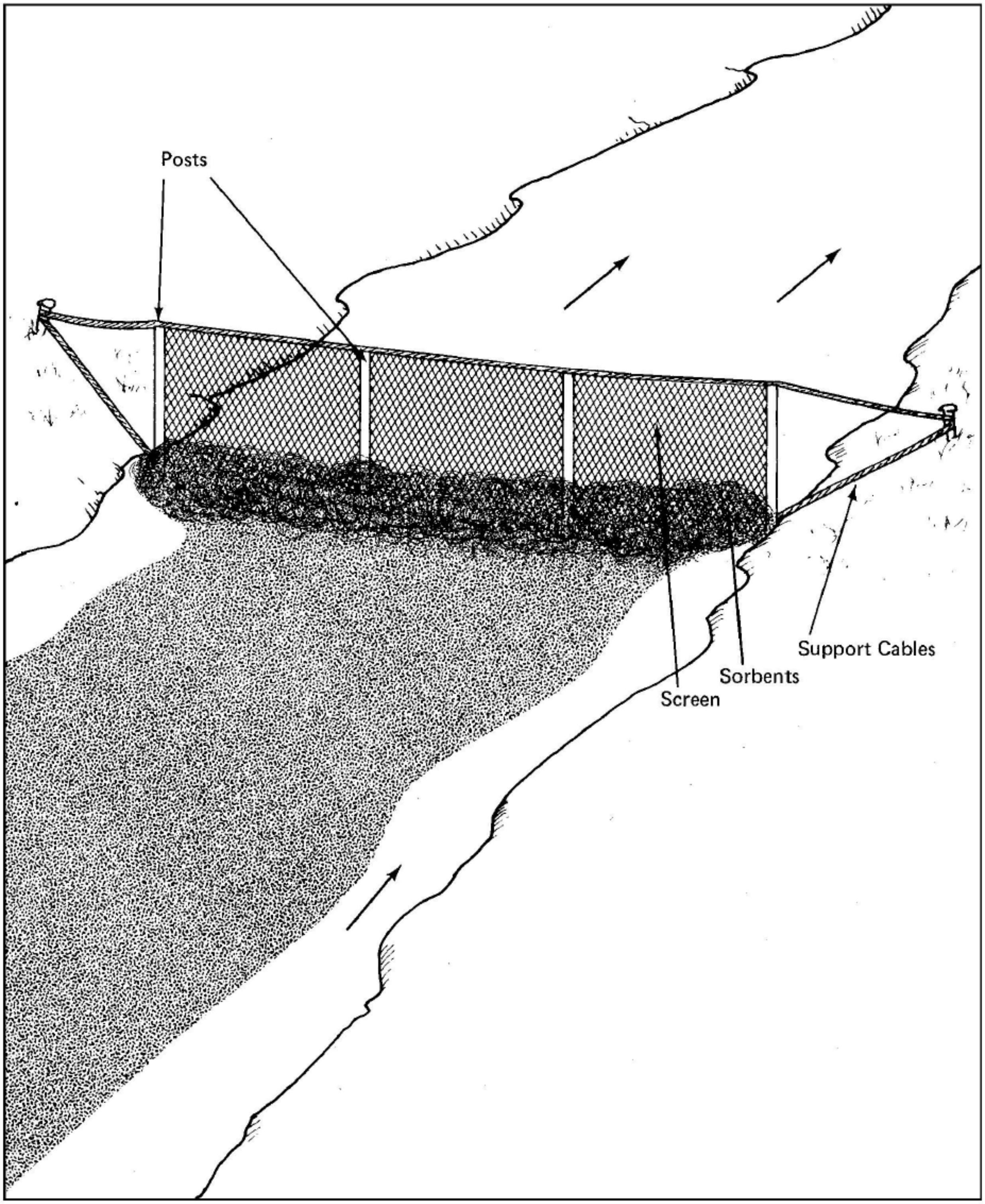
Maintenance. Turn booms or sorbents regularly for maximum absorbency and replace them when they are completely saturated with oil. Check booms and barriers periodically for leakage or damage.

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.

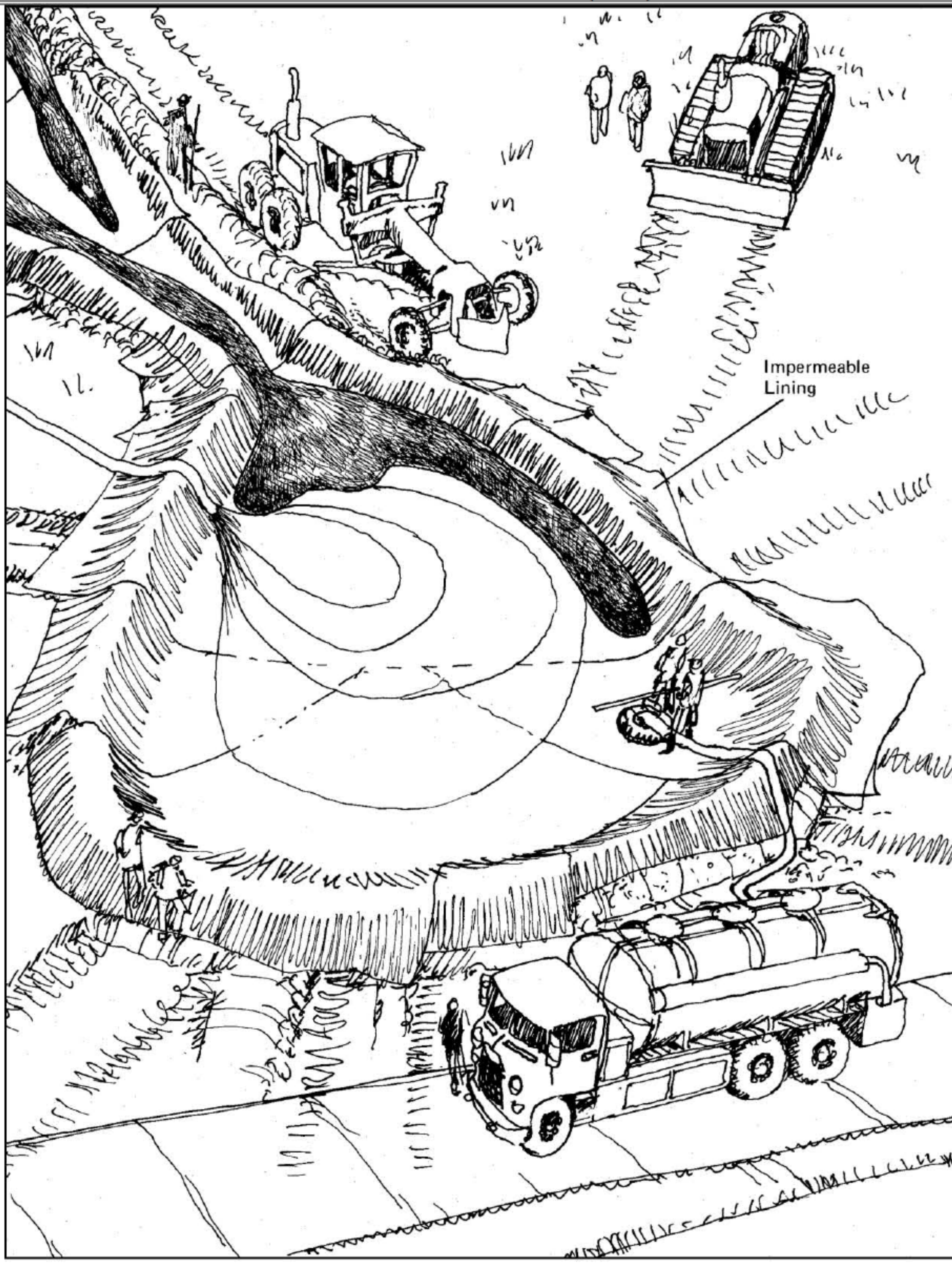
Maintenance. Check berms periodically for leakage and adequate height.

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.

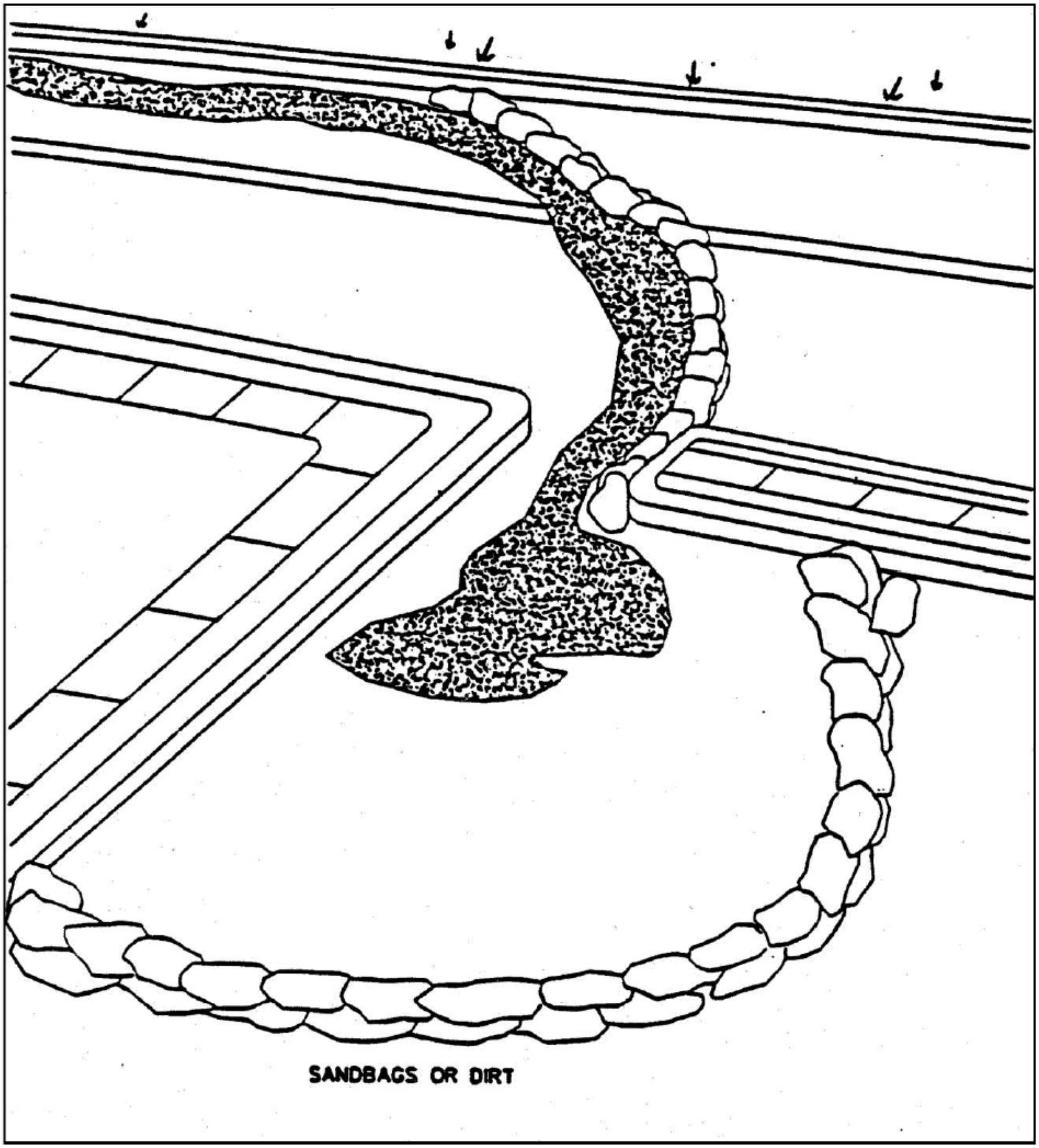
Maintenance. Periodically check barrier for leakage and adequate height.

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.

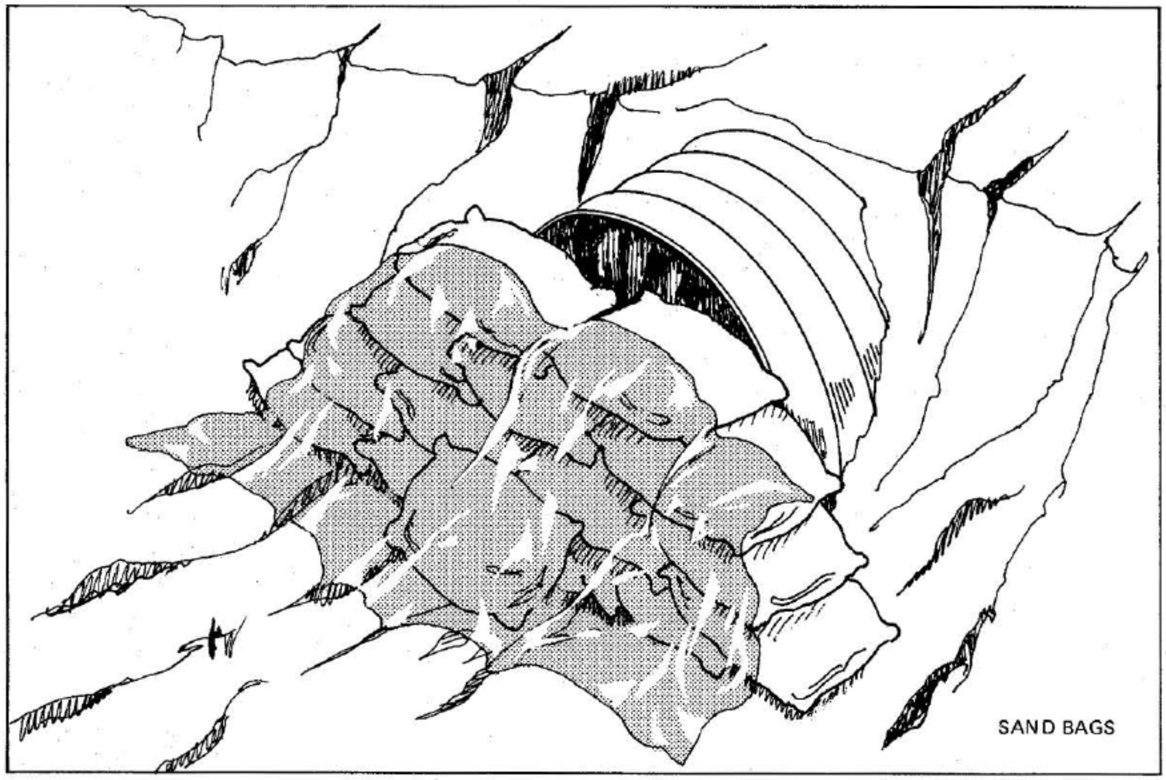
Cleanup. Remove or treat oiled sediments using techniques described in Appendix D and remove the block from the culvert.

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



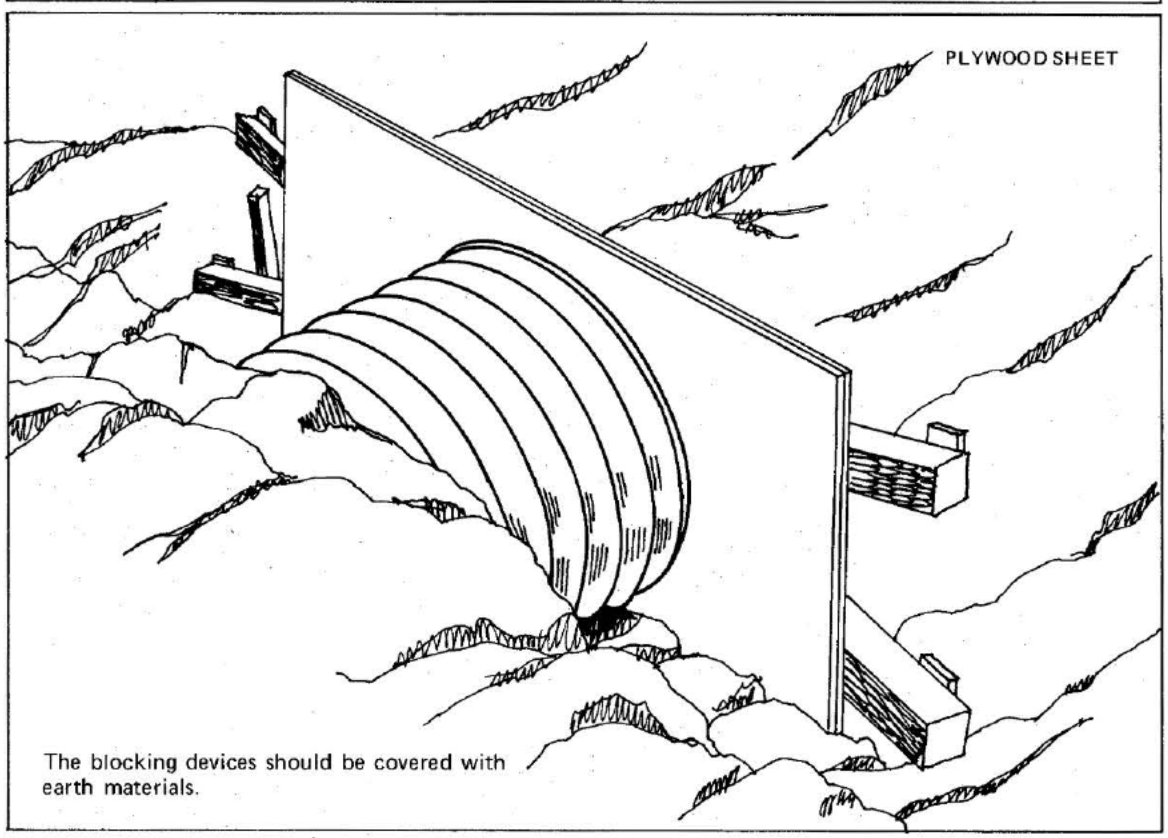
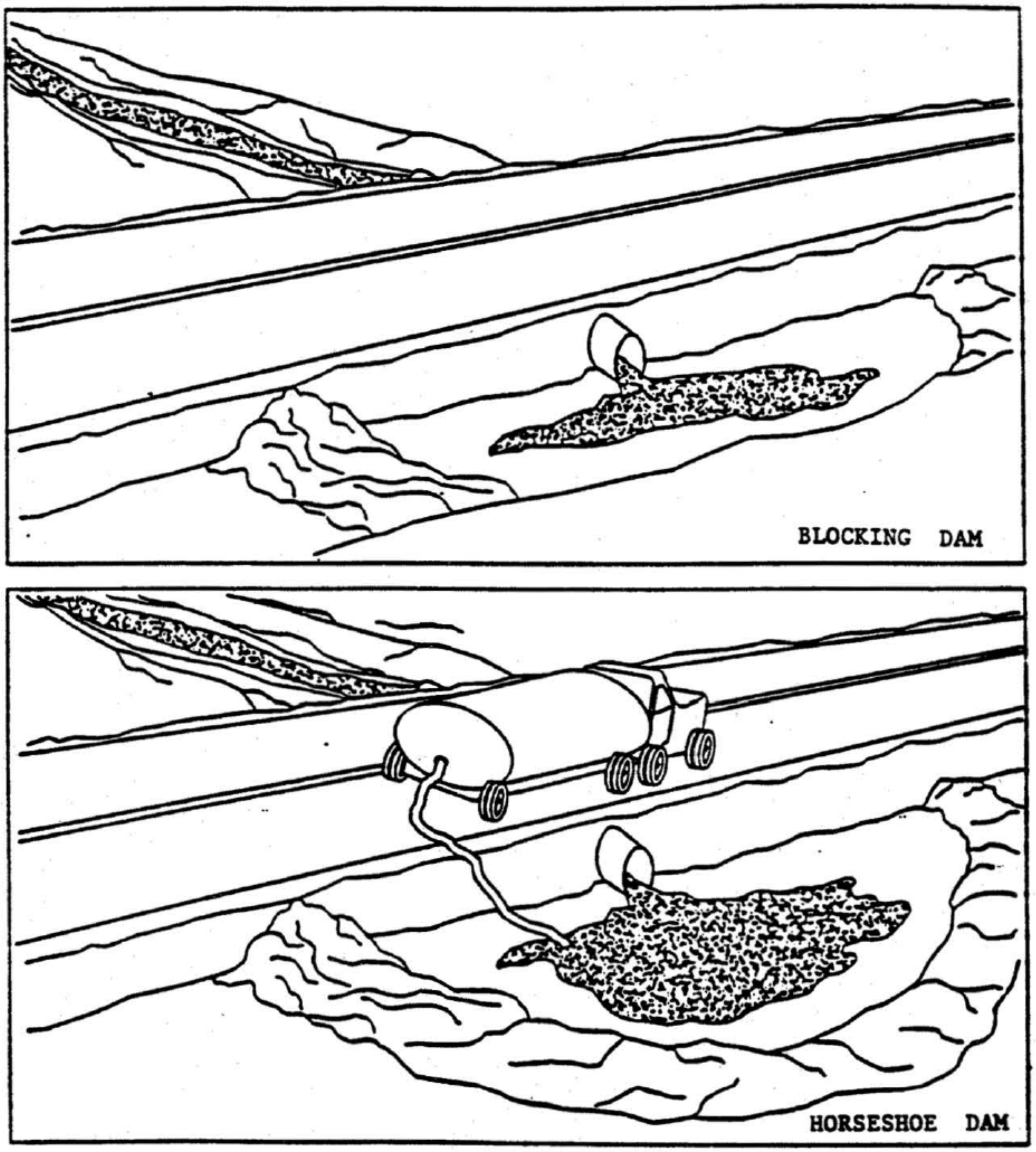


Figure 2.2-7

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. Facility drains may be equipped with Safe-Drain® valves that can be closed to prevent spill from entering the storm drains.

Limitations. Implementation time.

General Instructions. For storm drains equipped with Safe-Drain® inserts, use reach rod to turn valve handle located under the inlet grating. Figure 2.2-8 illustrates the typical Safe-Drain® valve. 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 2.2-9. 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 2.2-1

Safe-Drain® Valve Insert

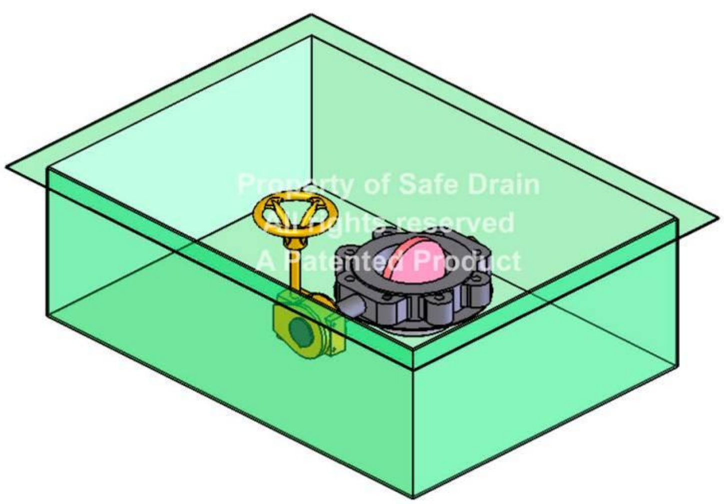
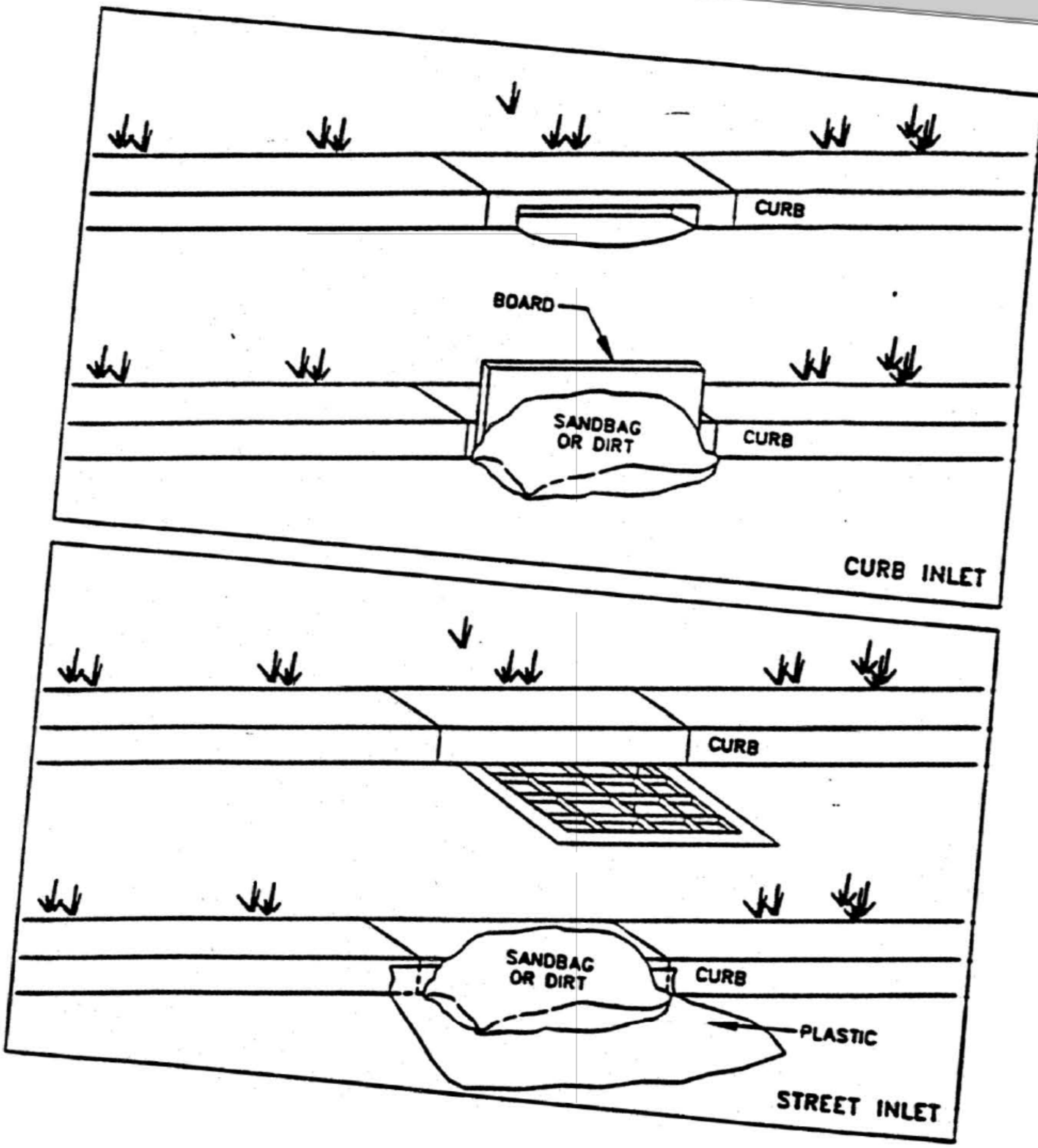


Figure 2.2-9
Storm Drain Blocking Techniques



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 2.2-10. 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.

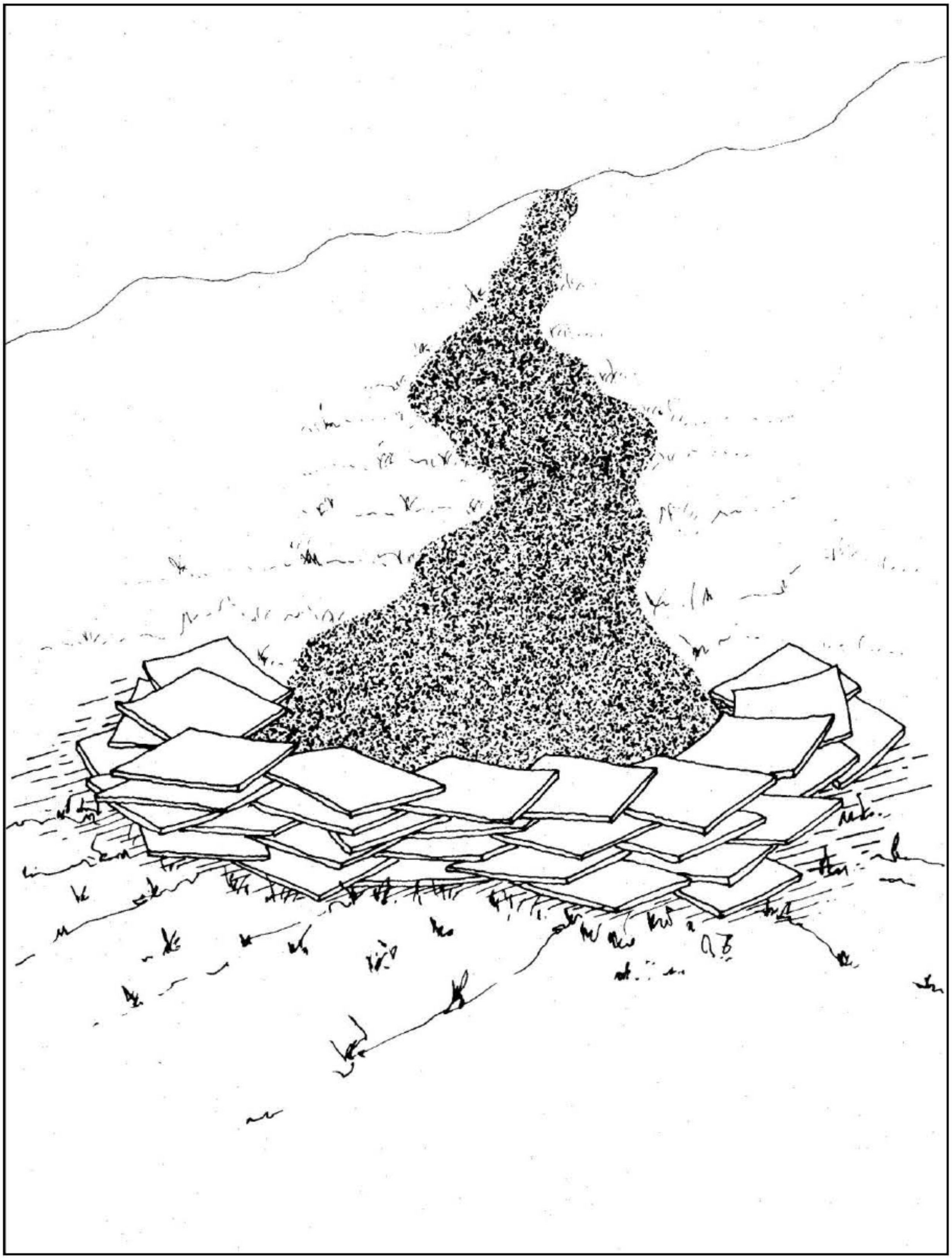
Maintenance. Turn sorbents periodically to maximize recovery and replace saturated sorbents. Add additional material as necessary.

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 2.2-10

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 2.2-11. 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.

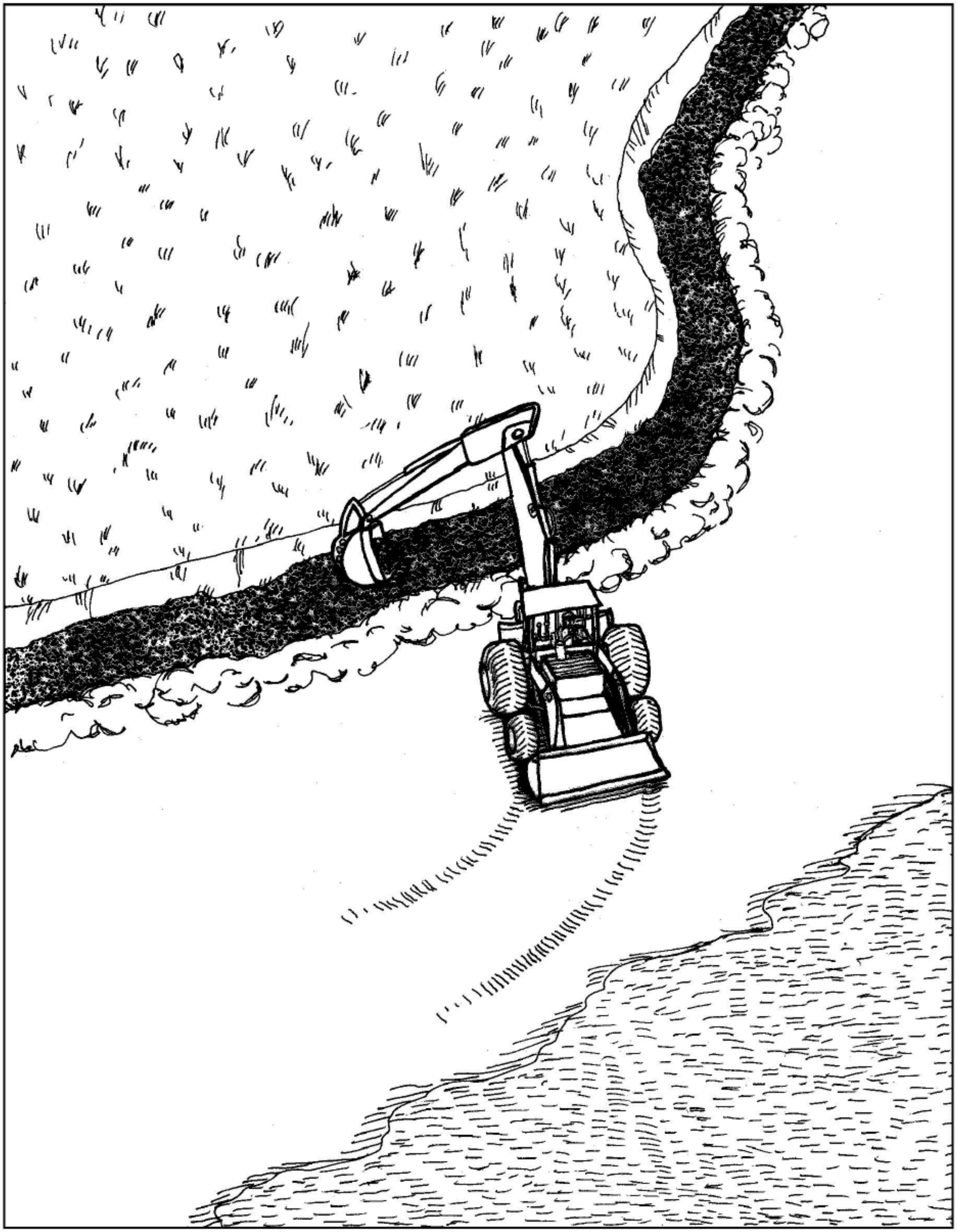
Maintenance. Periodically check for adequate flow, blockages caused by trench walls sloughing in, and debris.

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 2.2-11

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 2.2-12 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 2.2-13.

Figure 2.2-12

Earth Diversion Berm

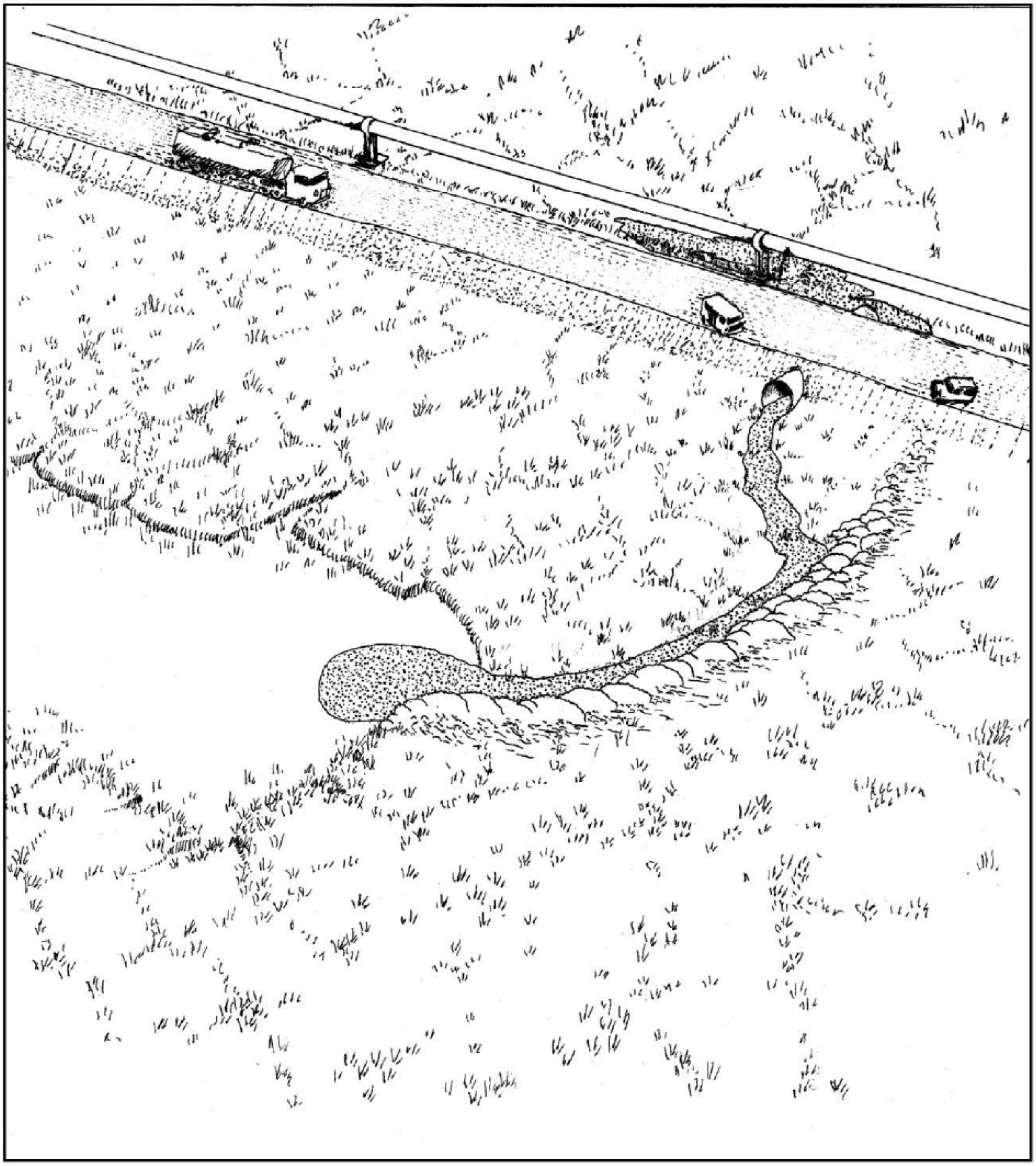
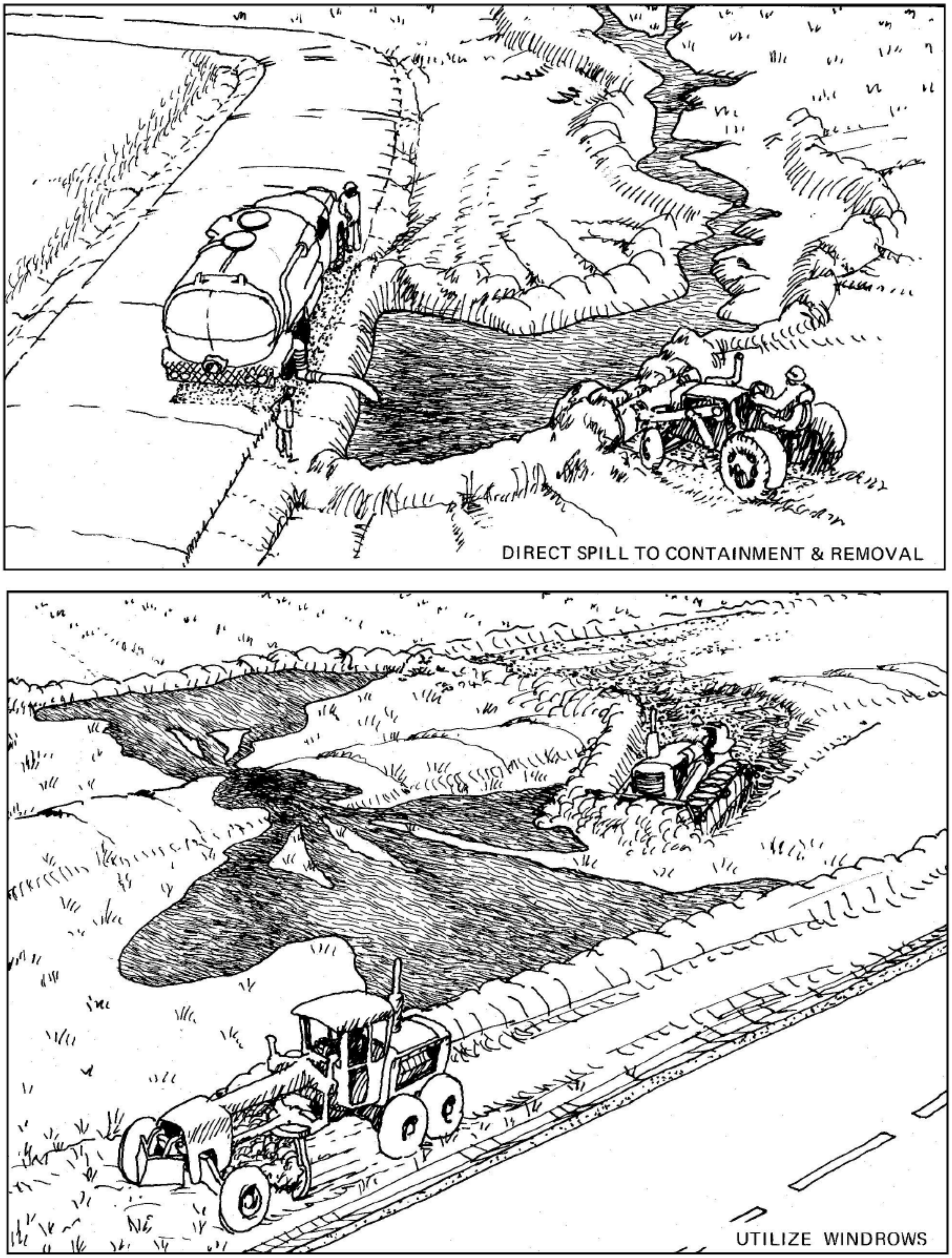


Figure 2.2-13

Alternate Earth Diversion Berm



2.2.11 Shoreline Berming

Use. Berms constructed along the mid-zone of a shoreline are used to prevent the spread of oil to backshore areas.

Limitations. Implementation time, generally only effective for one to two tidal cycles, and not applicable on high-energy shorelines or during heavy storms.

General Instructions. Operate a motor grader parallel to the surf line to cast a windrow along the mid-intertidal area. Several passes are usually required to produce an adequate berm height. A bulldozer is usually required to assist the motor grader when it gets stuck. Bulldozers can also be used to build sand berms. If heavy equipment is unavailable, shovels may be used to construct berms.

Equipment Required. Motor grader and bulldozer and/or hand tools.

Maintenance. Continually check berm for adequate height. Maintain or increase berm height as necessary.

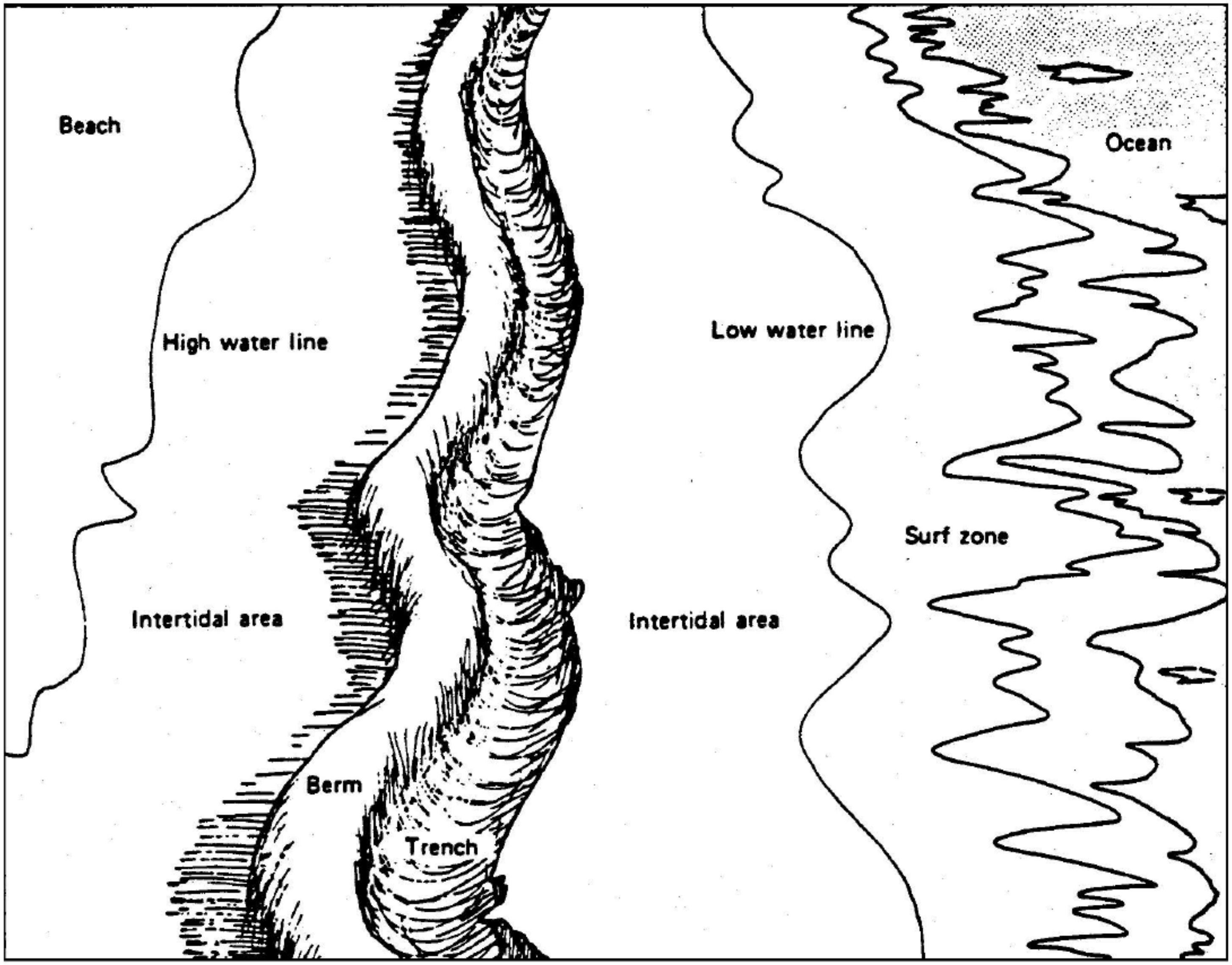
Cleanup. Remove or treat oiled beach material using techniques described in Appendix D.

Variations. A trench may be dug on the seaward side of the berm to assist in collecting incoming oil for subsequent removal (see Figure 2.2-14). This could, however, allow deeper product penetration into the sediments.

Berms with trenches on the backshore side can aid in containing product runoff when flushing contaminated backshore and upper intertidal areas.

Figure 2.2-14

Beach Berm



2.2.12 Shoreline Sumps

Use. Sumps excavated on shorelines are used to contain oil migration down beaches.

Limitations. Accessibility, shoreline must have some longshore drift, wave action cannot be extreme, and tidal range should be small.

General Instructions. Dig a sump across the intertidal zone of the beach with a trench extending towards the surf at decreasing depths. Pile excavated material on the down current side of the trench and sump. As oil moves down the beach, it is intercepted by the berm and trench which then channel the oil into the sump. Recover the oil by skimming, vacuuming, or pumping. Figure 2.2-15 illustrates this technique. Several strategically located sumps may be required on long stretches of beach.

Equipment Required. Backhoe and/or hand tools

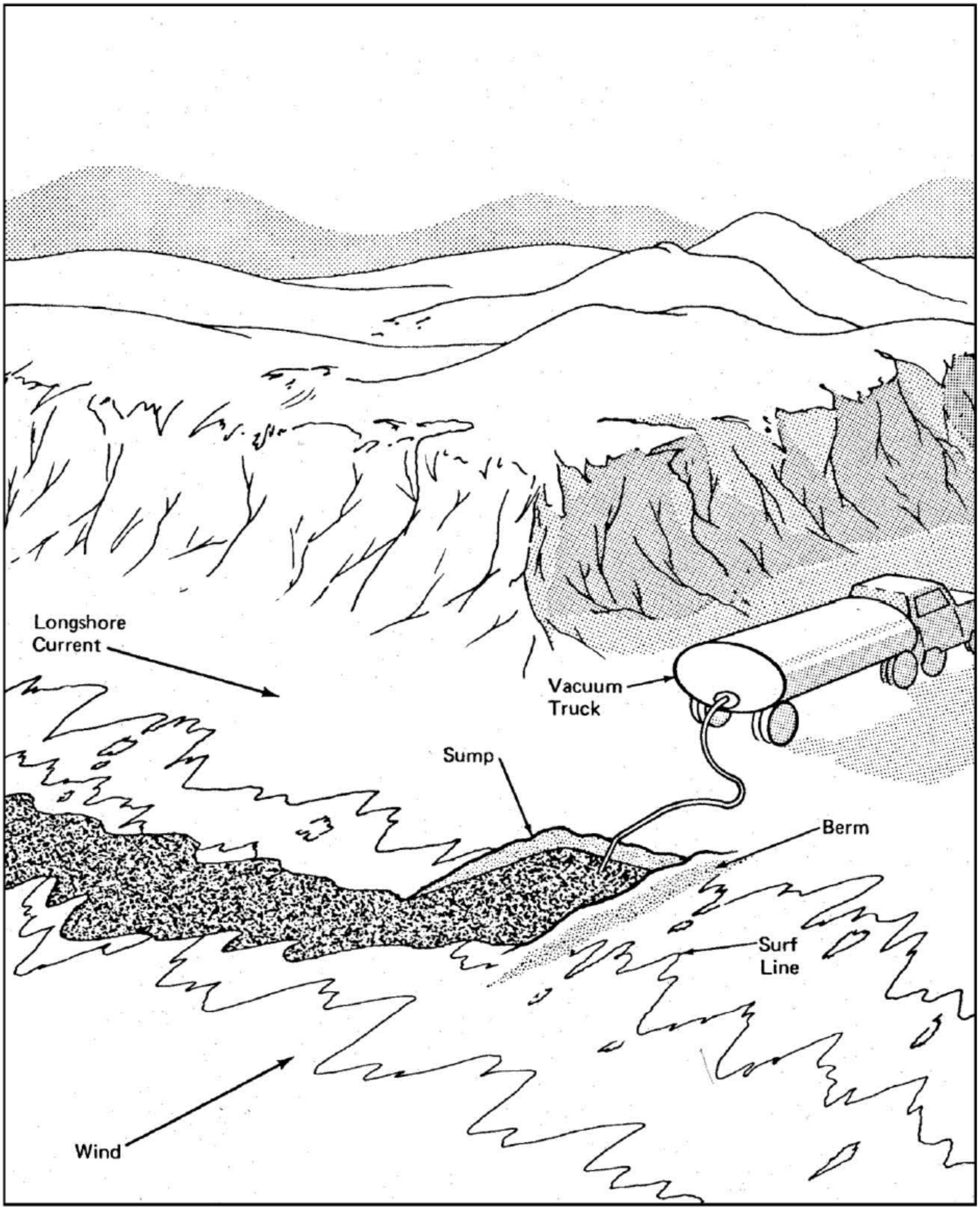
Maintenance. Berm materials must be continually replaced as they are eroded away by waves. Oil may have to be pushed into the sump with boards or squeegees to increase cleanup efficiency.

Cleanup. Remove or treat oiled beach materials using techniques described in Section 2.6 and fill in the sump.

Variations. None.

Figure 2.2-15

Collection of Oil on Beaches with Sumps



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.

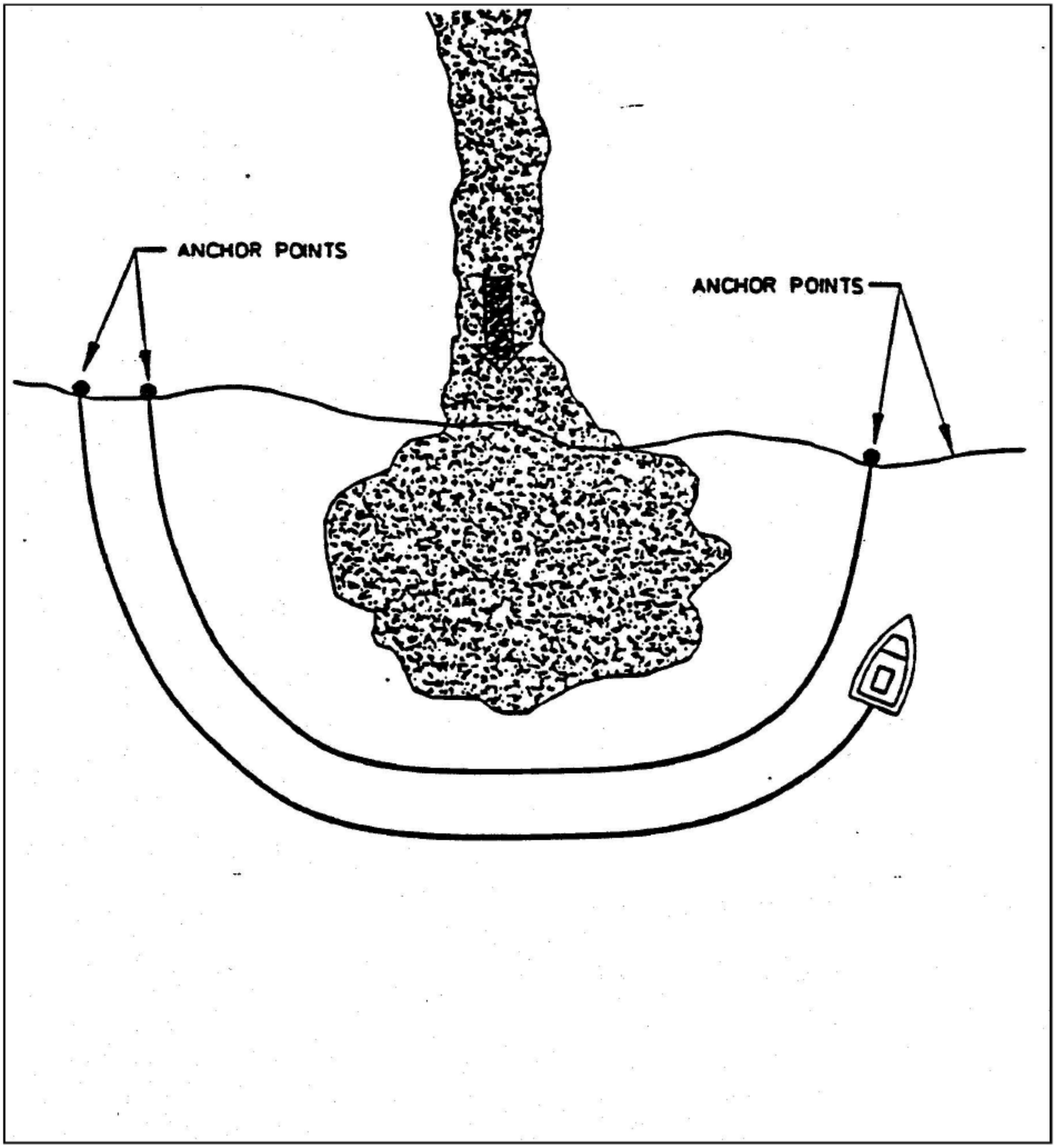
Maintenance. Check booms periodically for leakage or broken, twisted, or submerged sections.

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

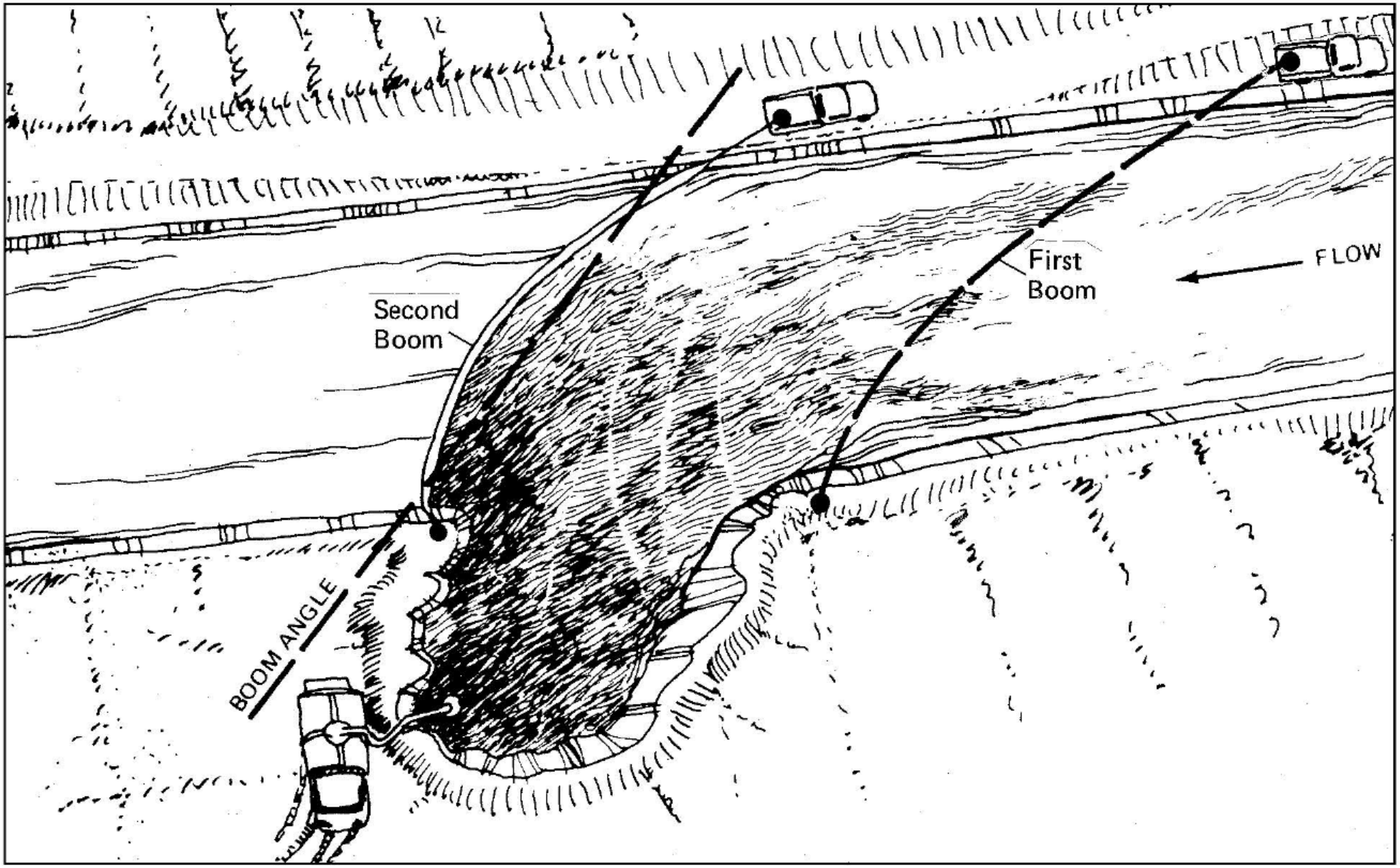
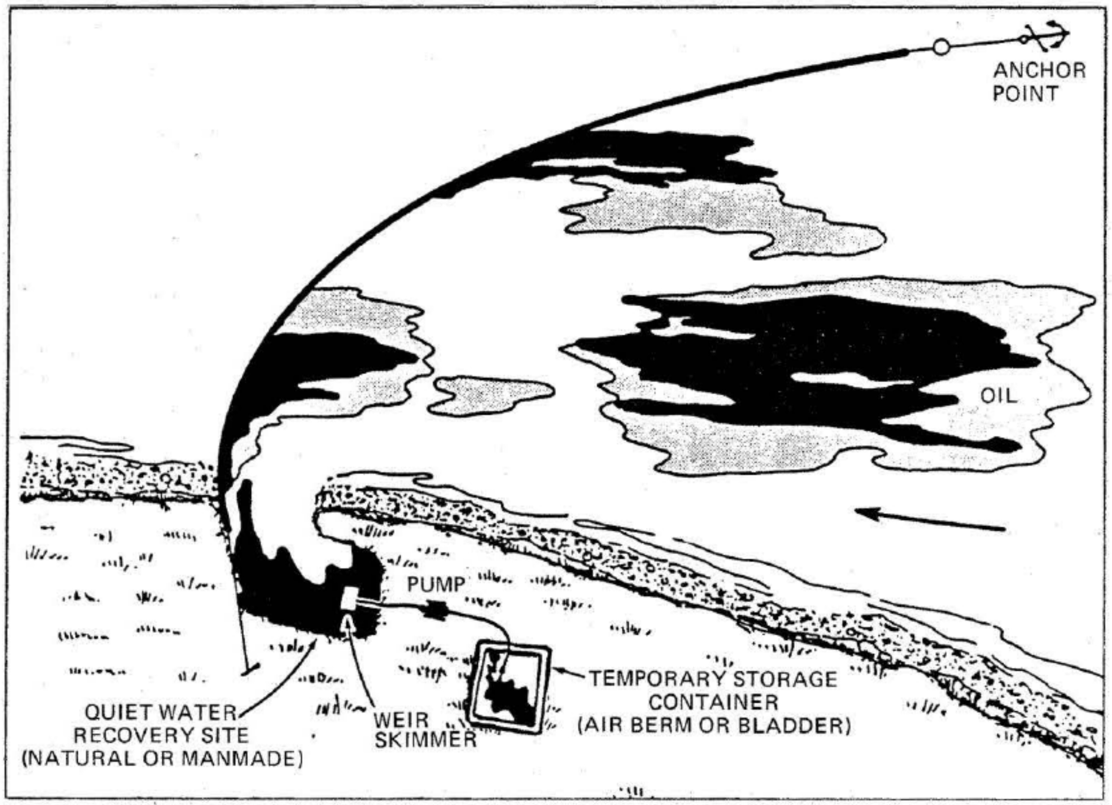
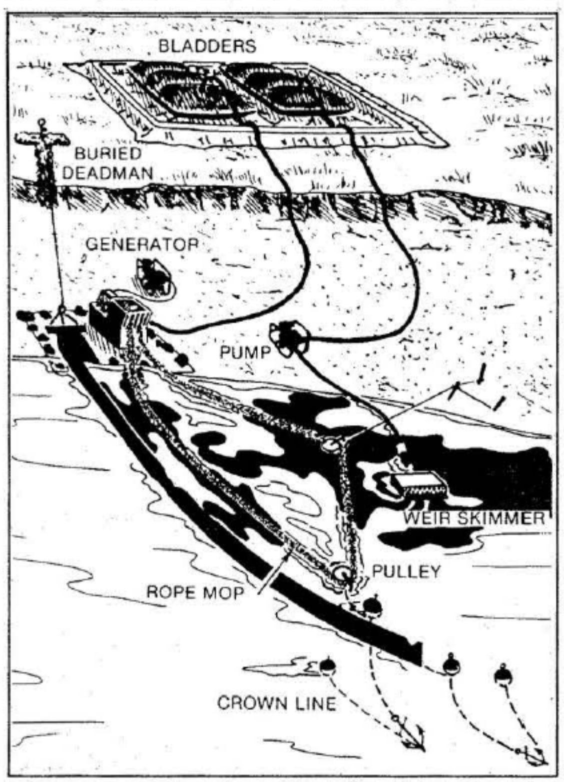
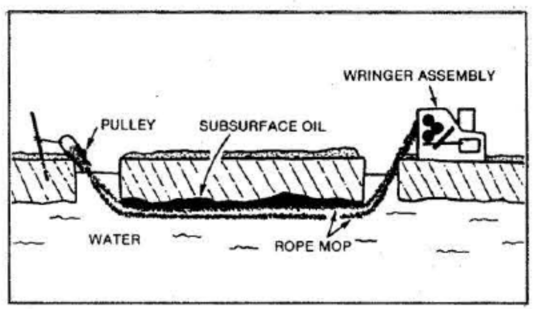


Figure 2.3-3.

Use of Skimmers Along a Shoreline







2.3.3 Open Water (Coastal) 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, heavy seas, 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

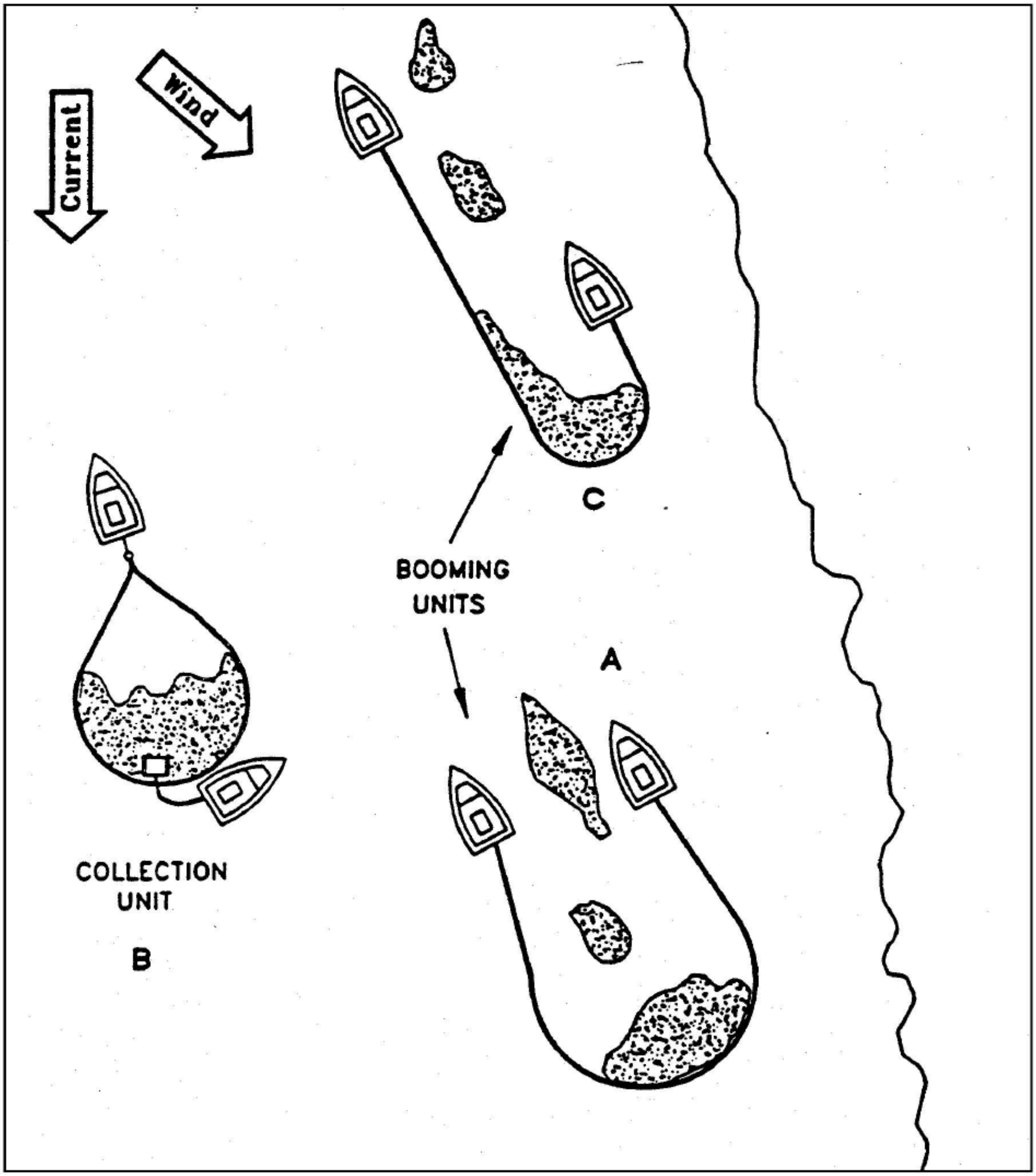


Figure 2.3-5.

Open Water Containment: Boom in Encirclement Configuration

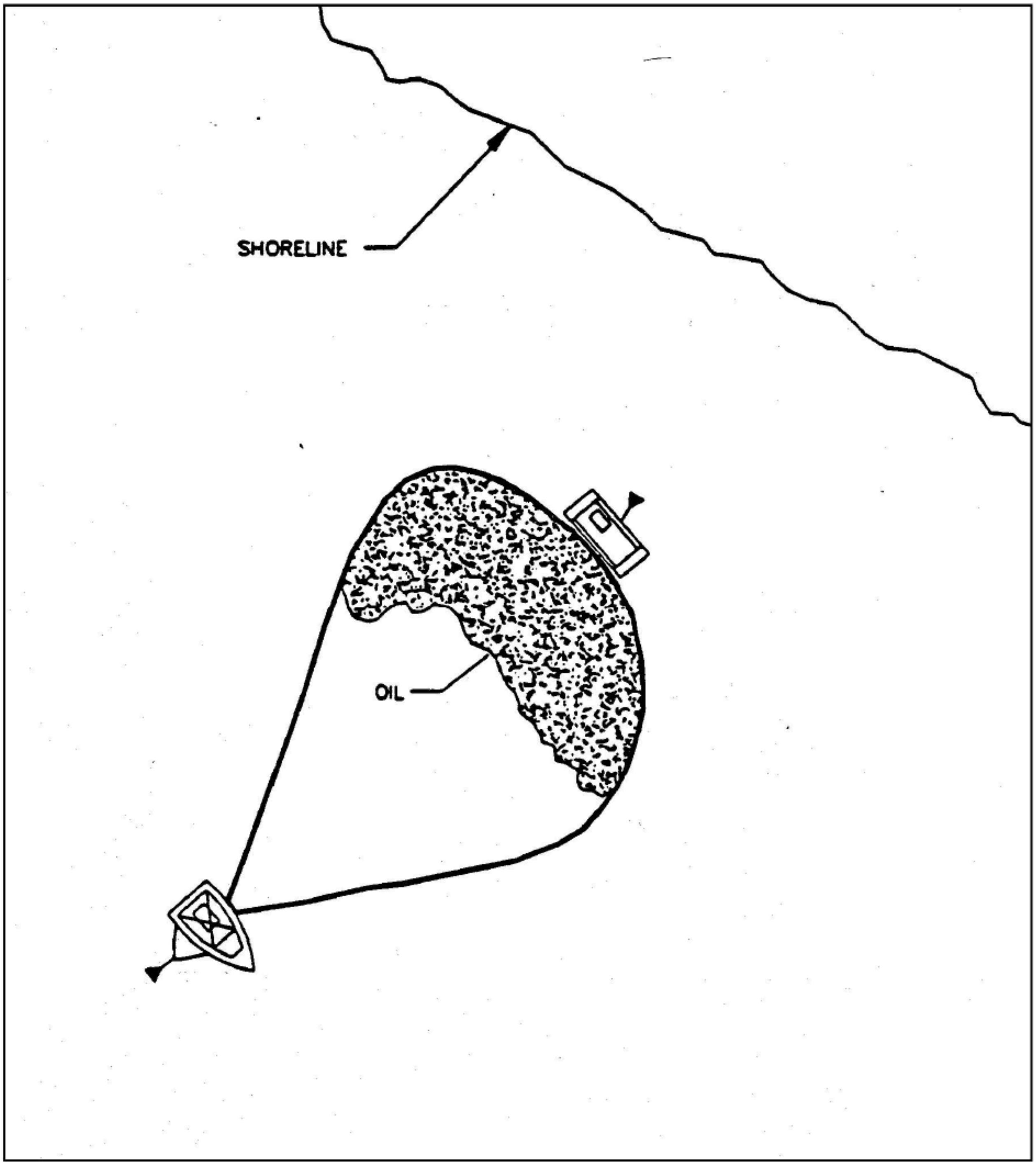
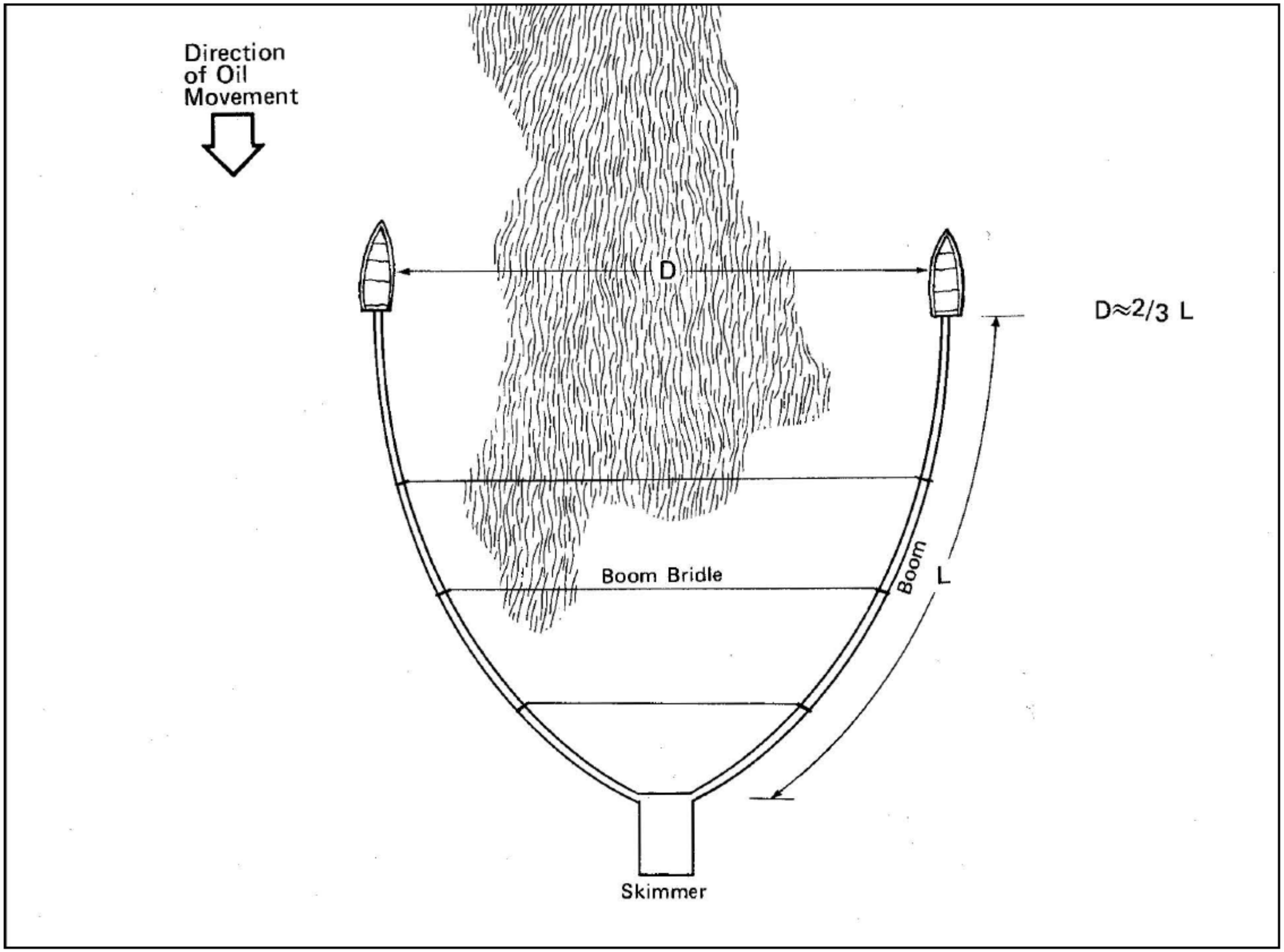


Figure 2.3-6.

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 tidal 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.

Marine Diversion Booming Techniques for Protection of Sensitive Areas Error! Bookmark not defined

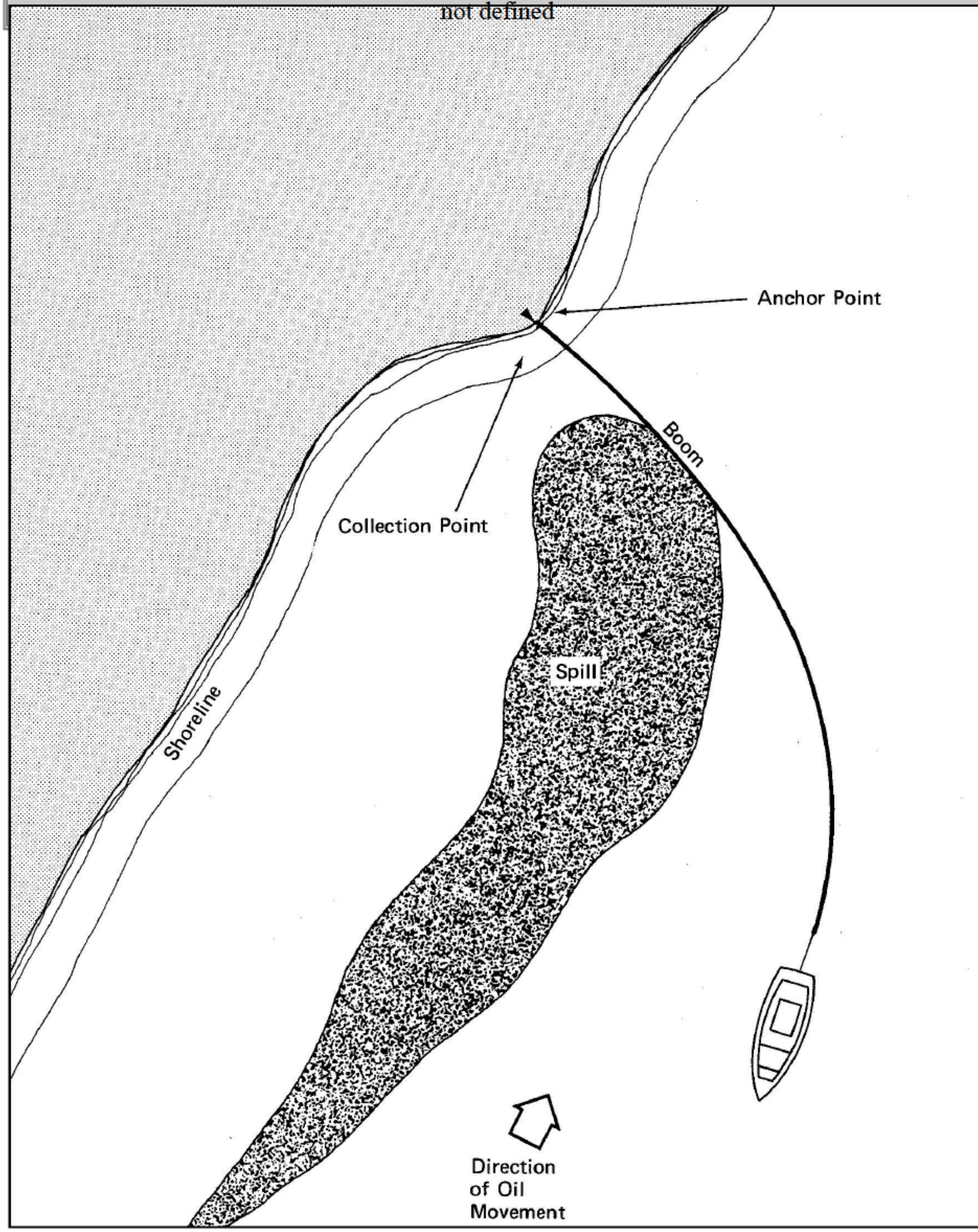


Figure 2.3-8.

Shoreline Containment: Diversion Booming to Skimmer

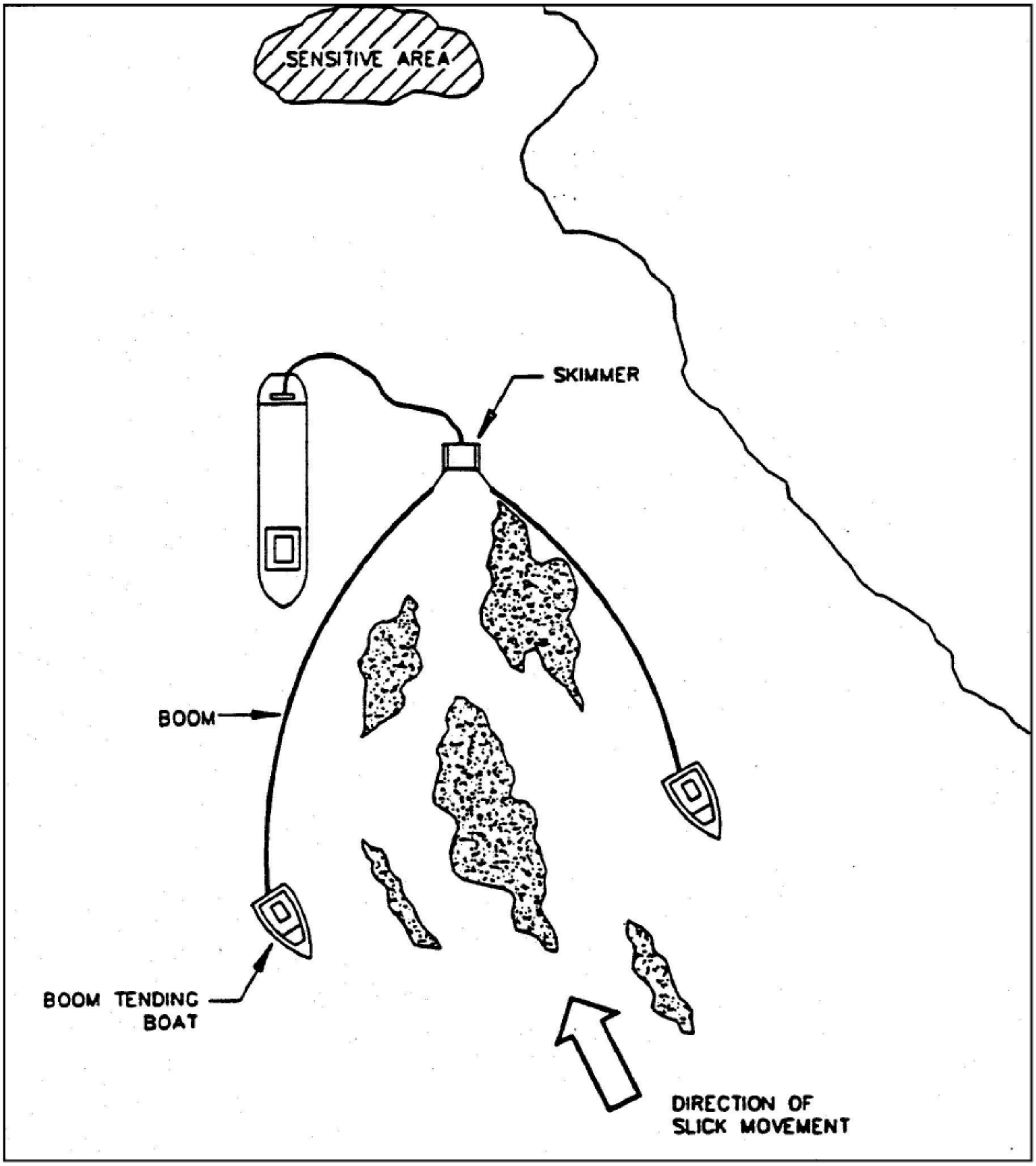
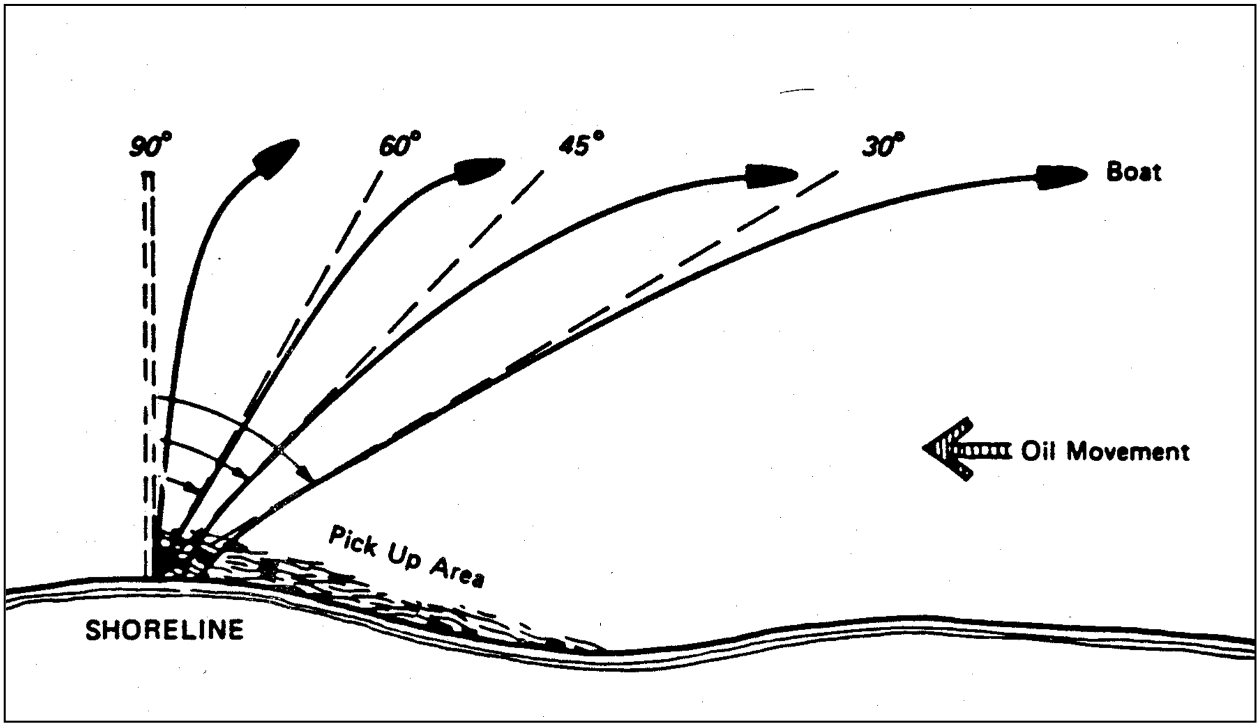


Figure 2.3-9.

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

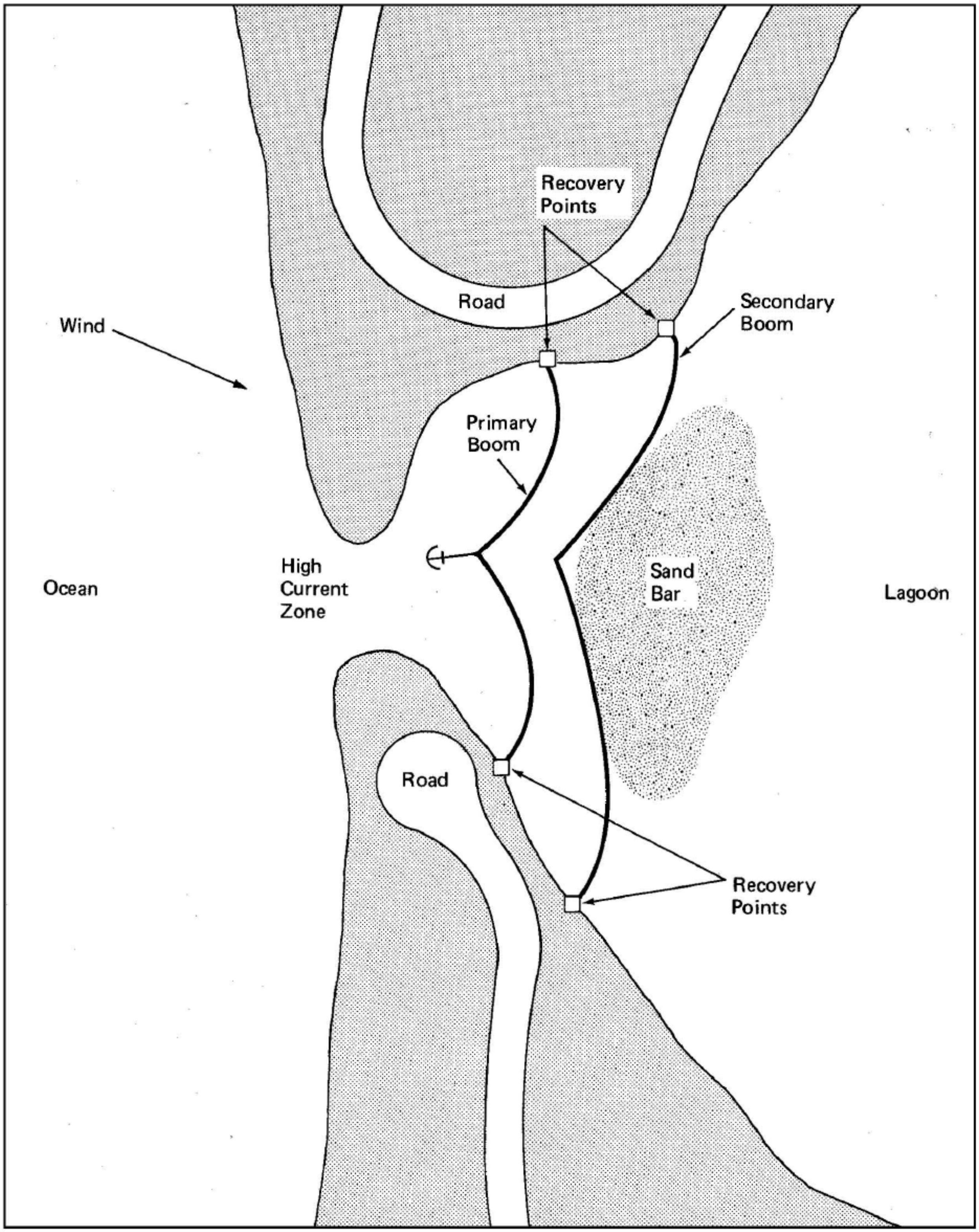


Figure 2.3-11.

Shoreline Containment: Exclusion Booming at Inlet With High Channel Currents

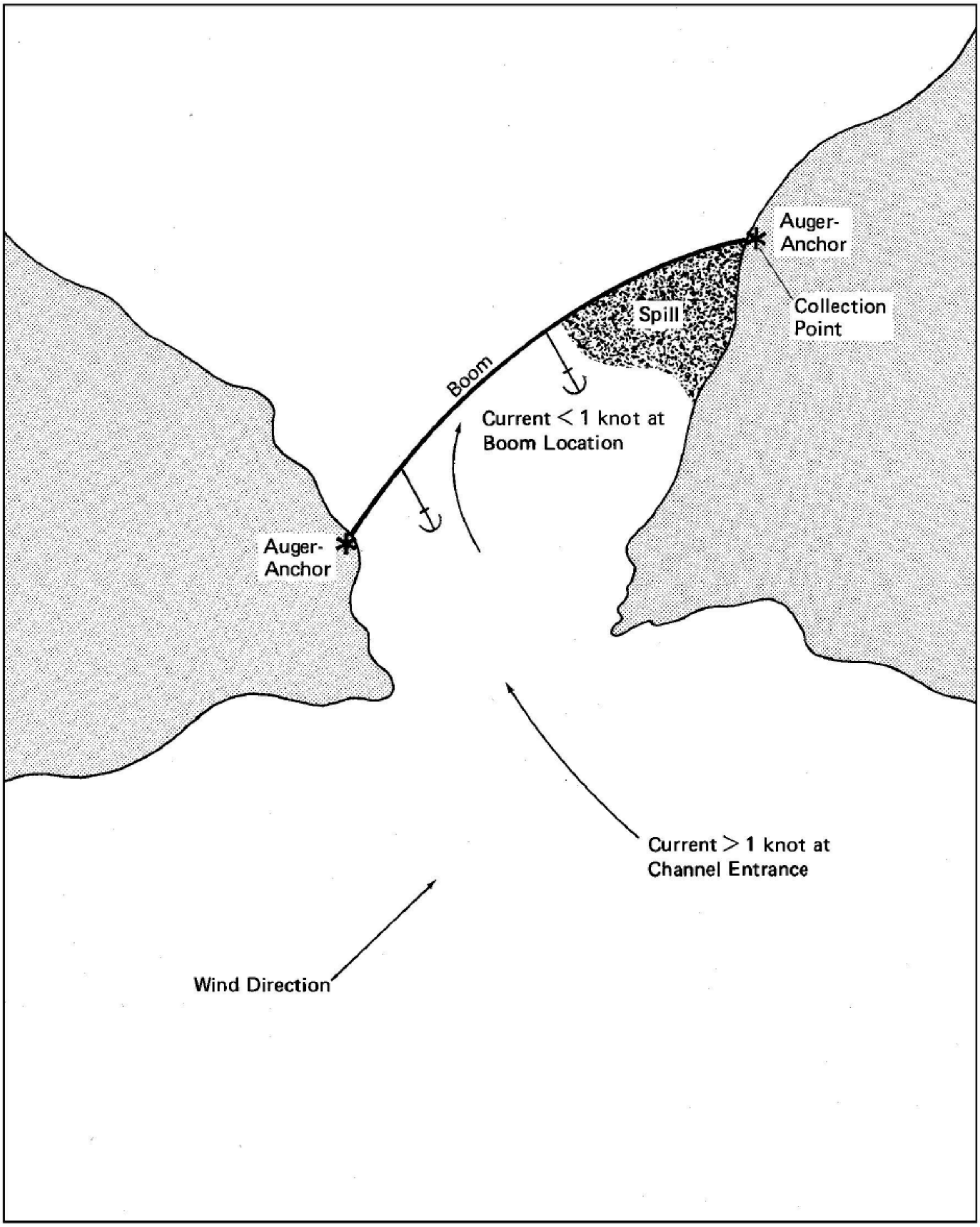
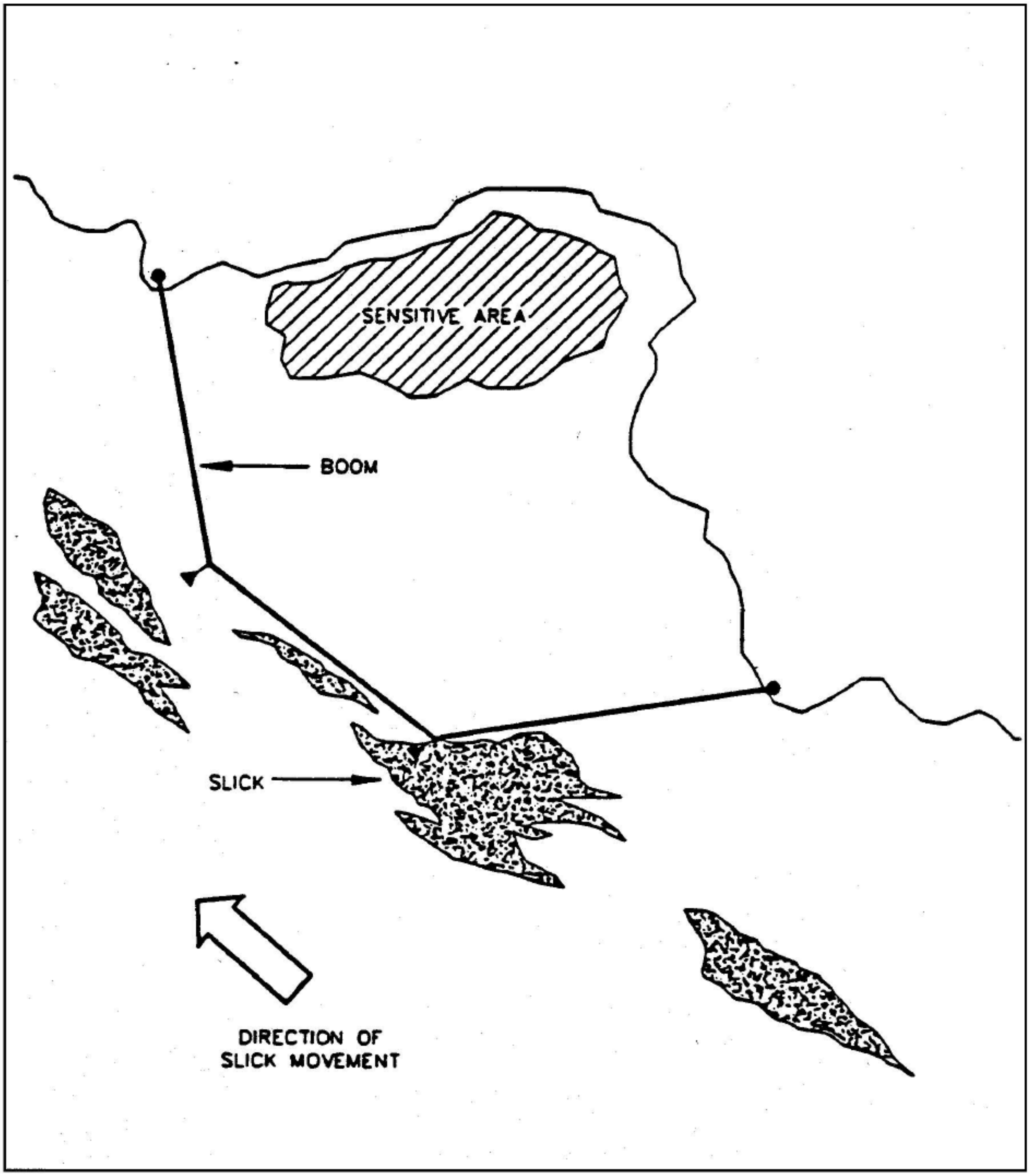


Figure 2.3-12.

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)

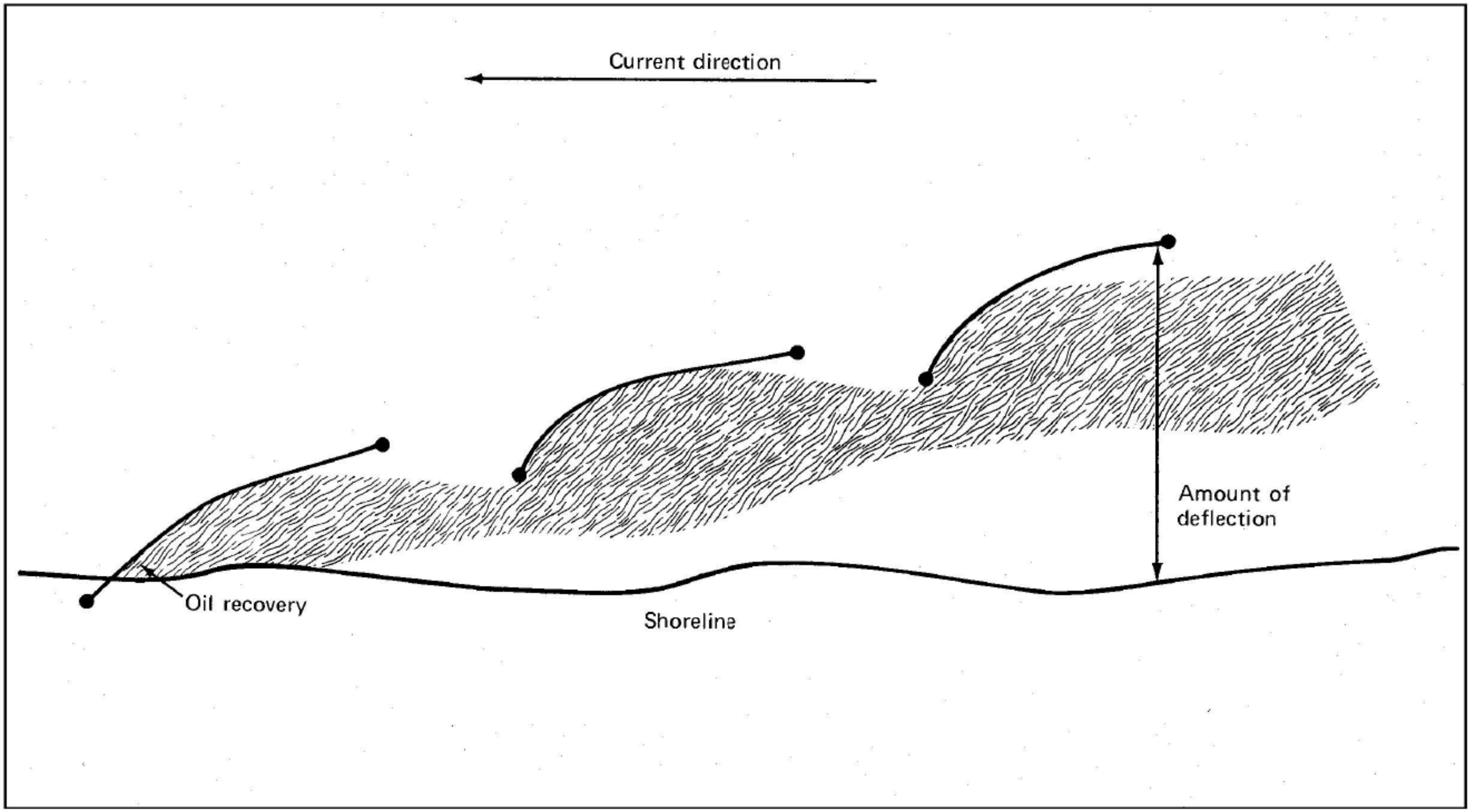


Figure 2.3-14.

Cascading Diversion Booms

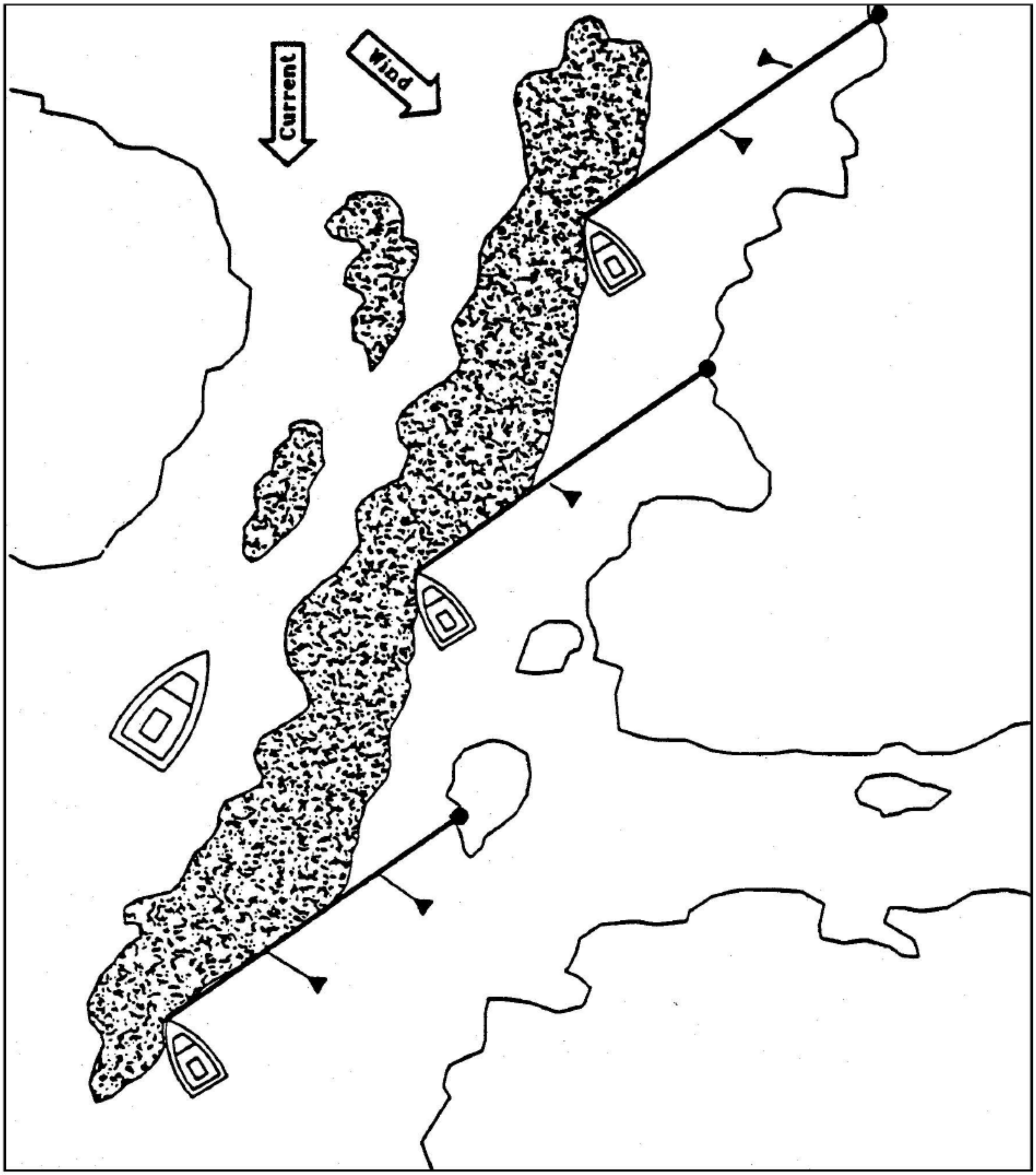
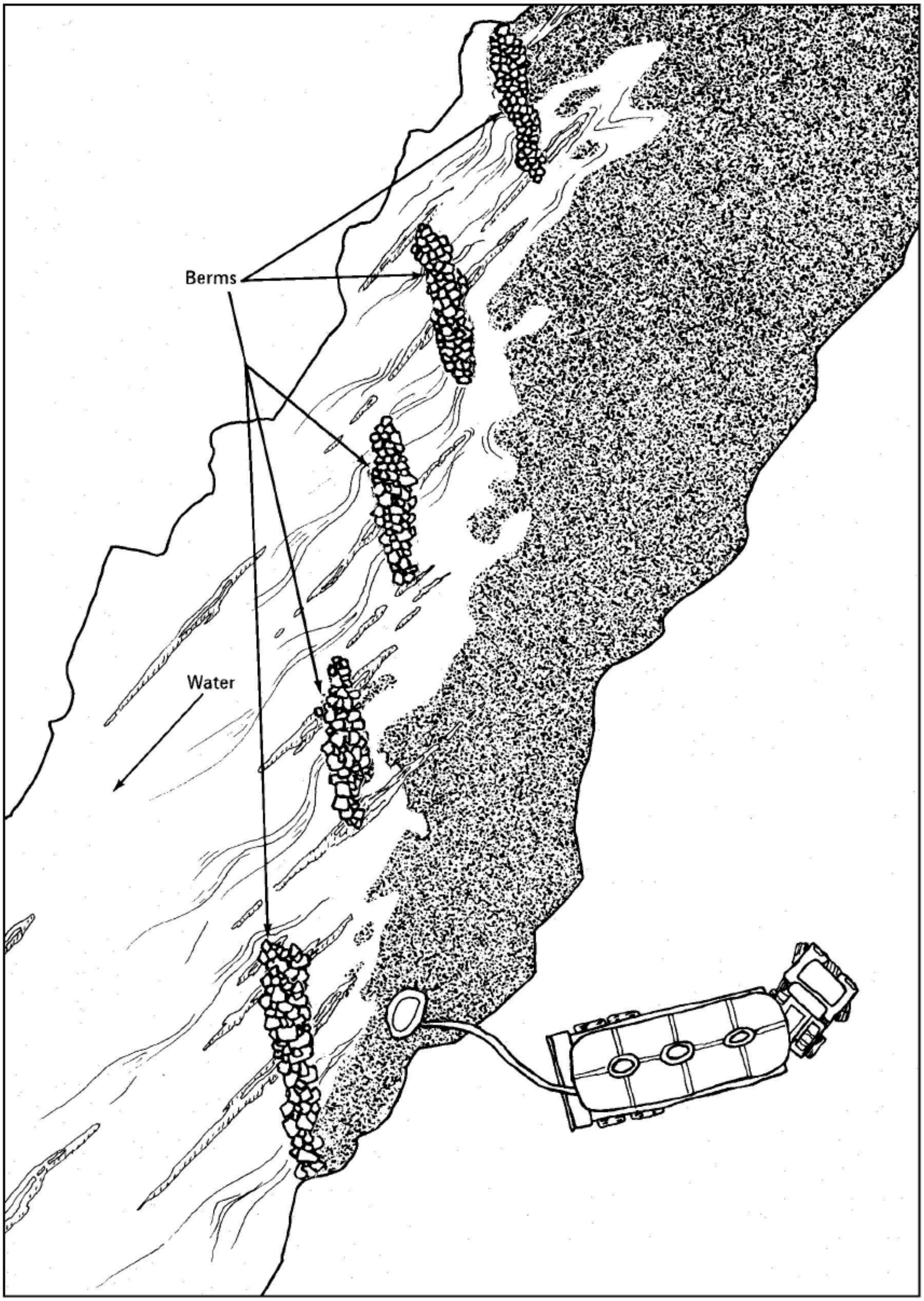


Figure 2.3-15.

Cascading Berming



THIS PAGE INTENTIONALLY LEFT BLANK

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

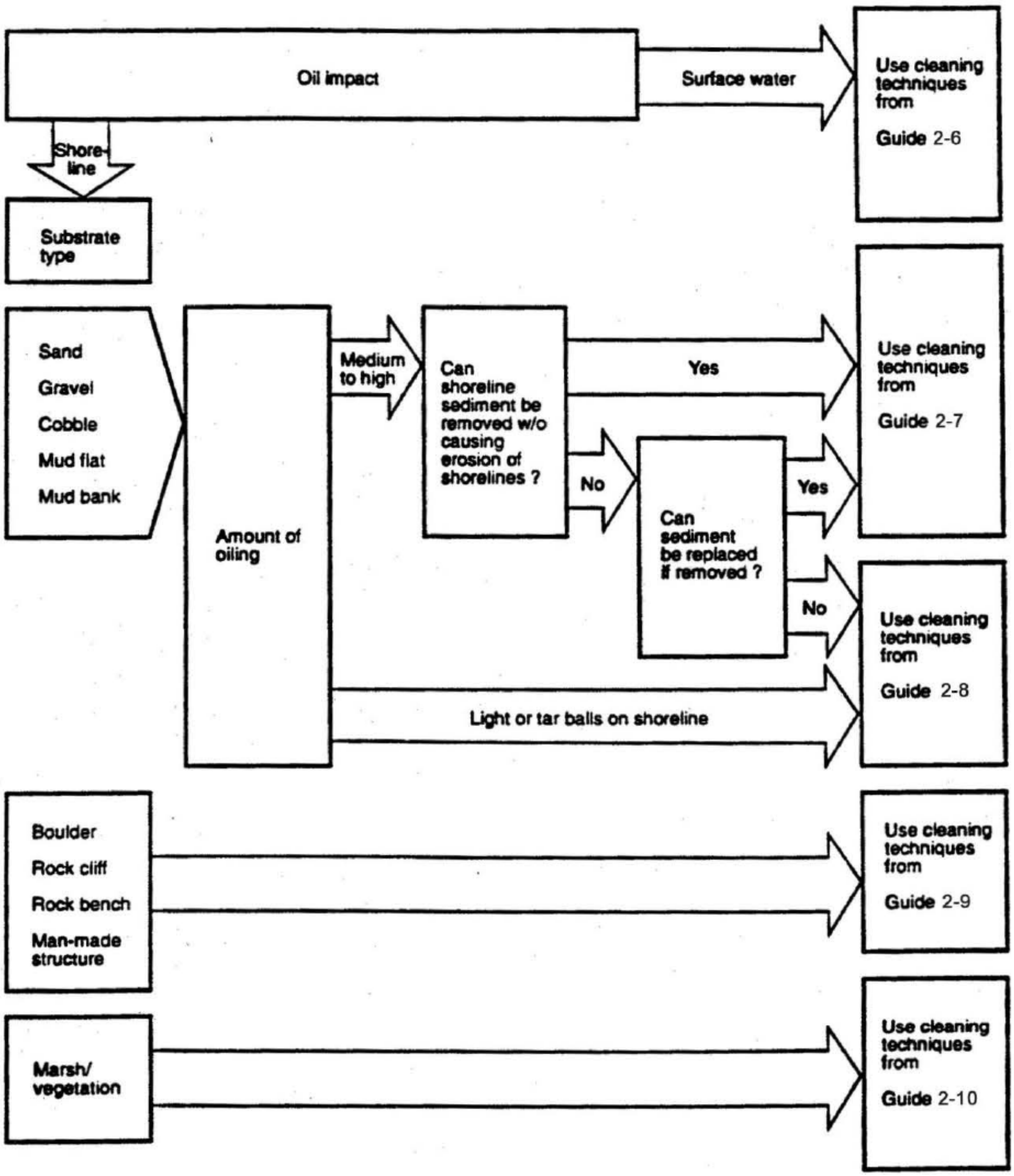
Historically a number of cleanup techniques have been developed to recover spilled oil. Open water recovery techniques depend primarily on the physical characteristics of the oil and logistical considerations, such as availability of equipment and weather. Selection of the proper technique to clean an 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.

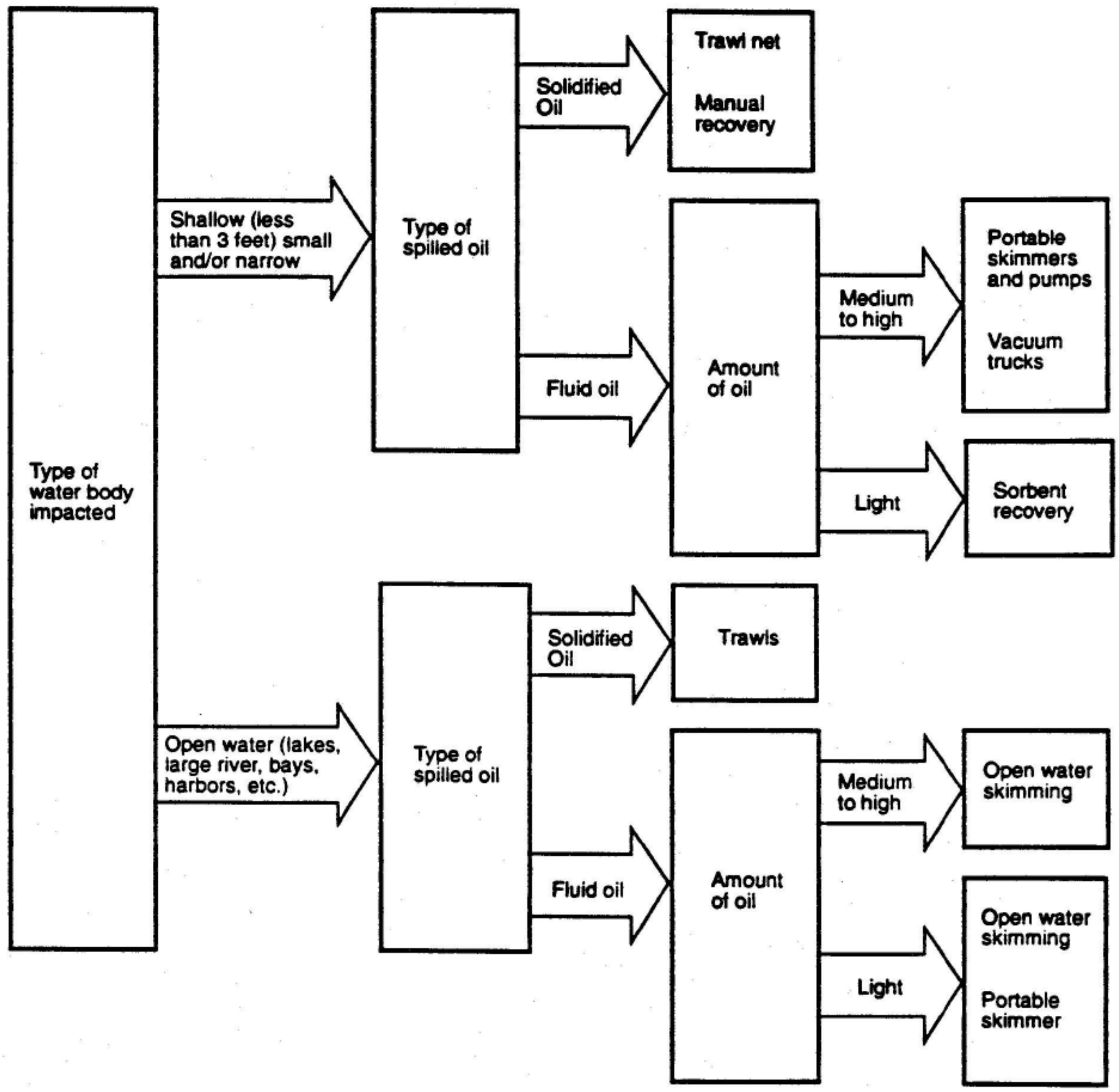
Guide 2-1

Key to Decision Guides



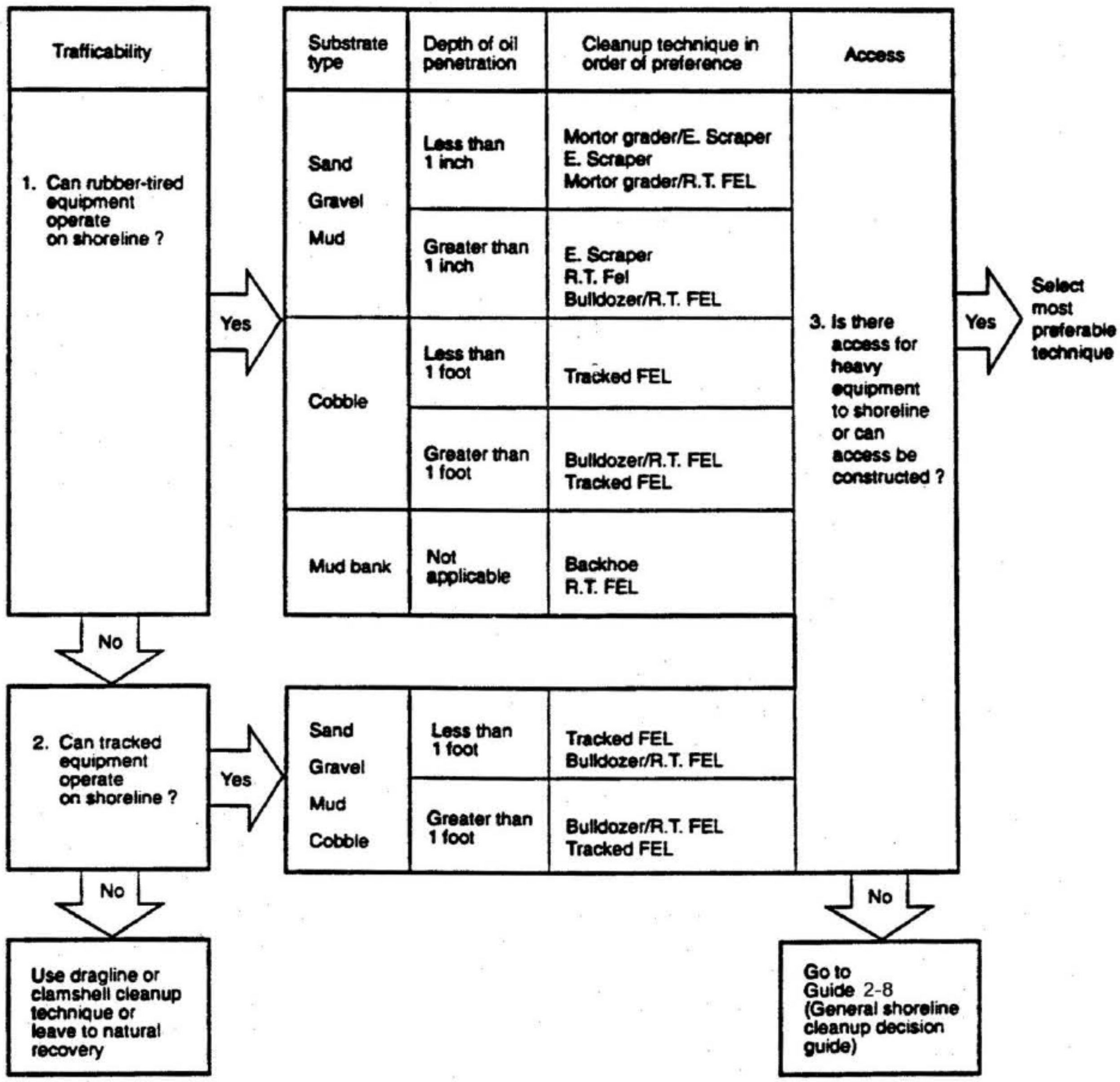
Guide 2-2

Surface Water Cleanup Decision Guide



Guide 2-3

Mechanized Shoreline Cleanup Decision Guide

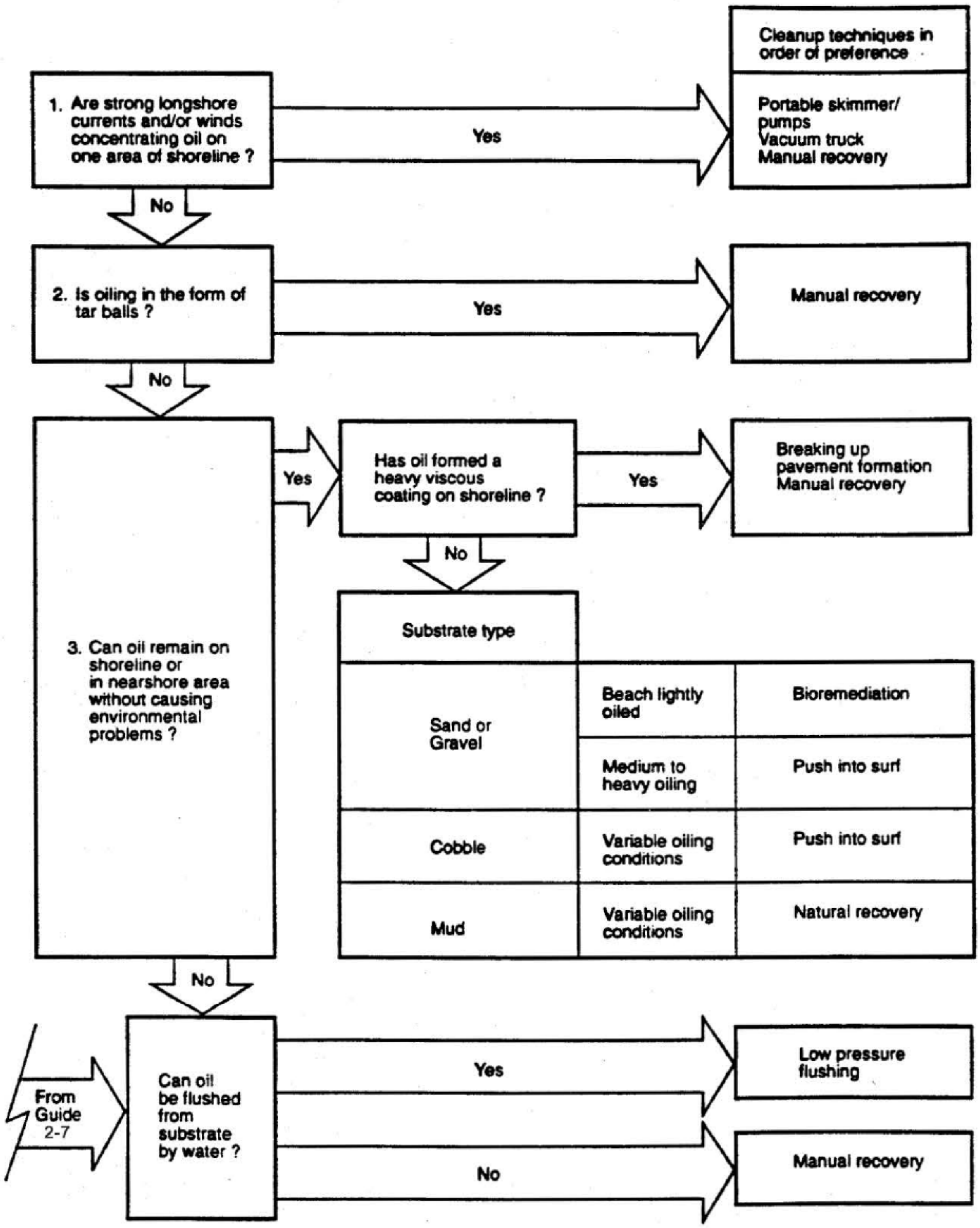


R.T. = Rubber Tired

FEL = Front End Loader

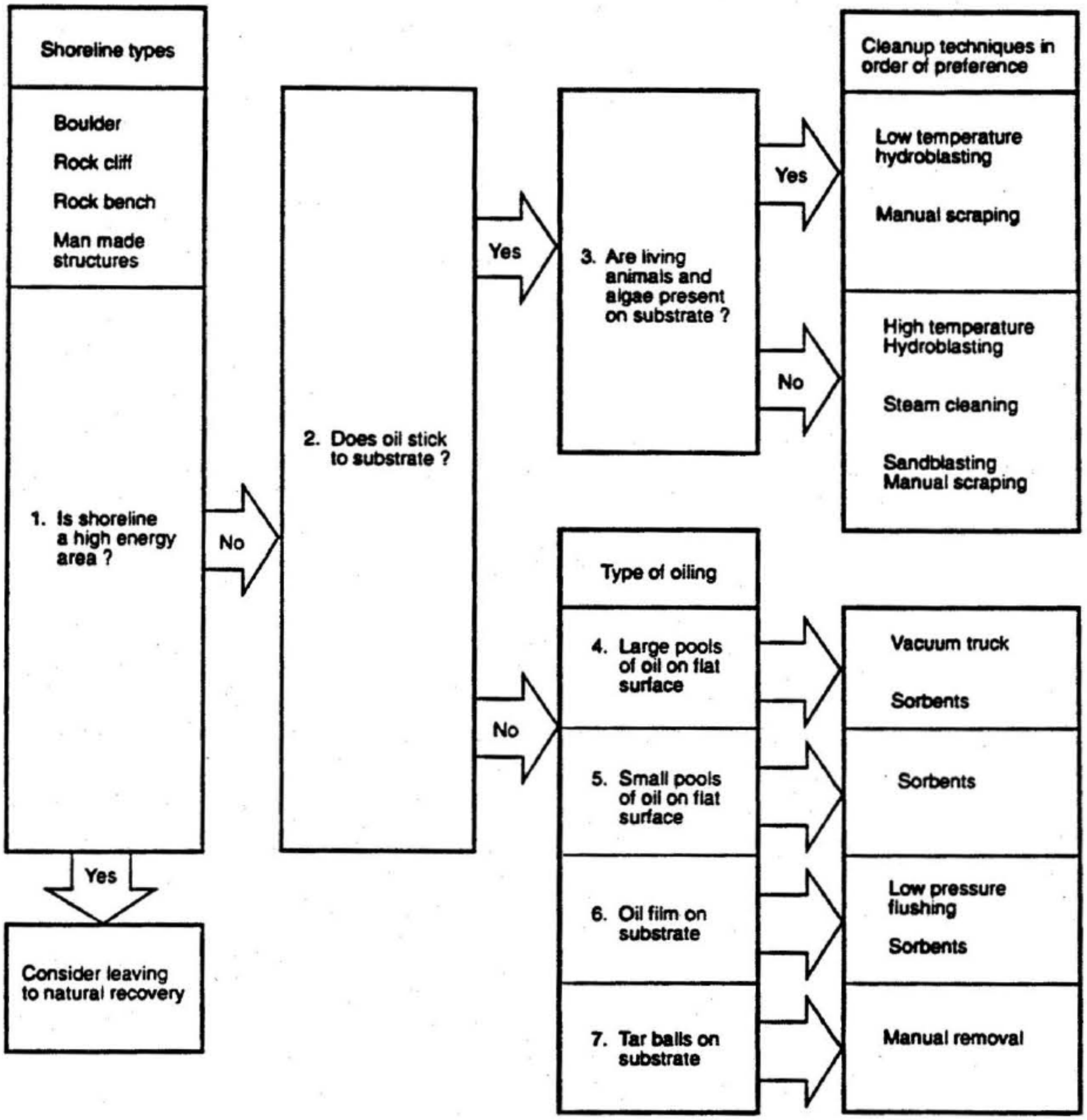
Guide 2-4

General Shoreline Cleanup Decision Guide



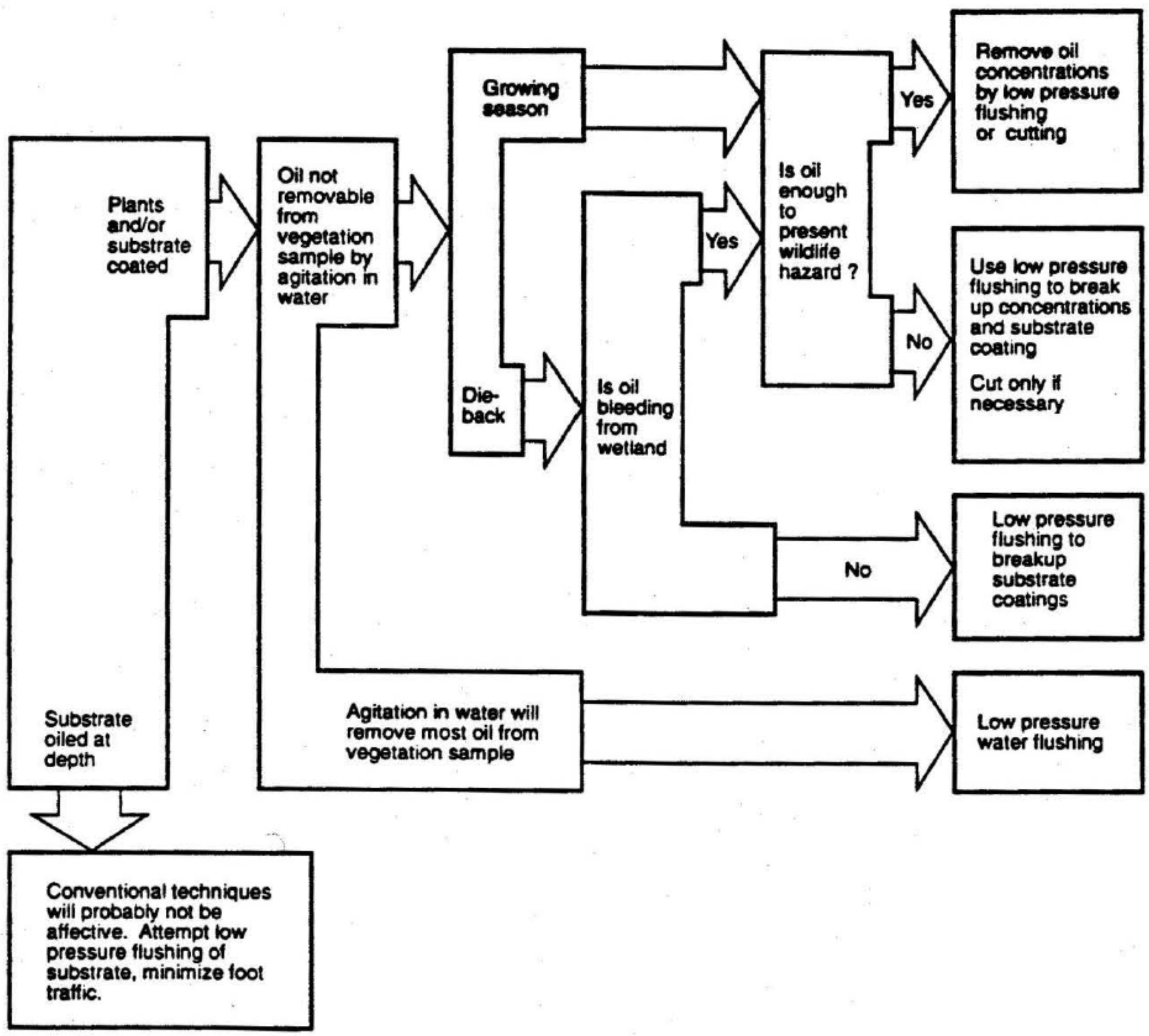
Guide 2-5

Nonsediment Substrate Cleanup Decision Guide



Guide 2-6

Wetland Cleanup Decision Guide



<u>Decision Guide</u>. 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.

<u>Shoreline Cleanup Factors</u>. 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:

<u>Guide 2-5</u> - 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.

<u>Guide 2-8</u> - Can oil remain on shoreline or in nearshore areas without causing environmental problems? HECO 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.

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

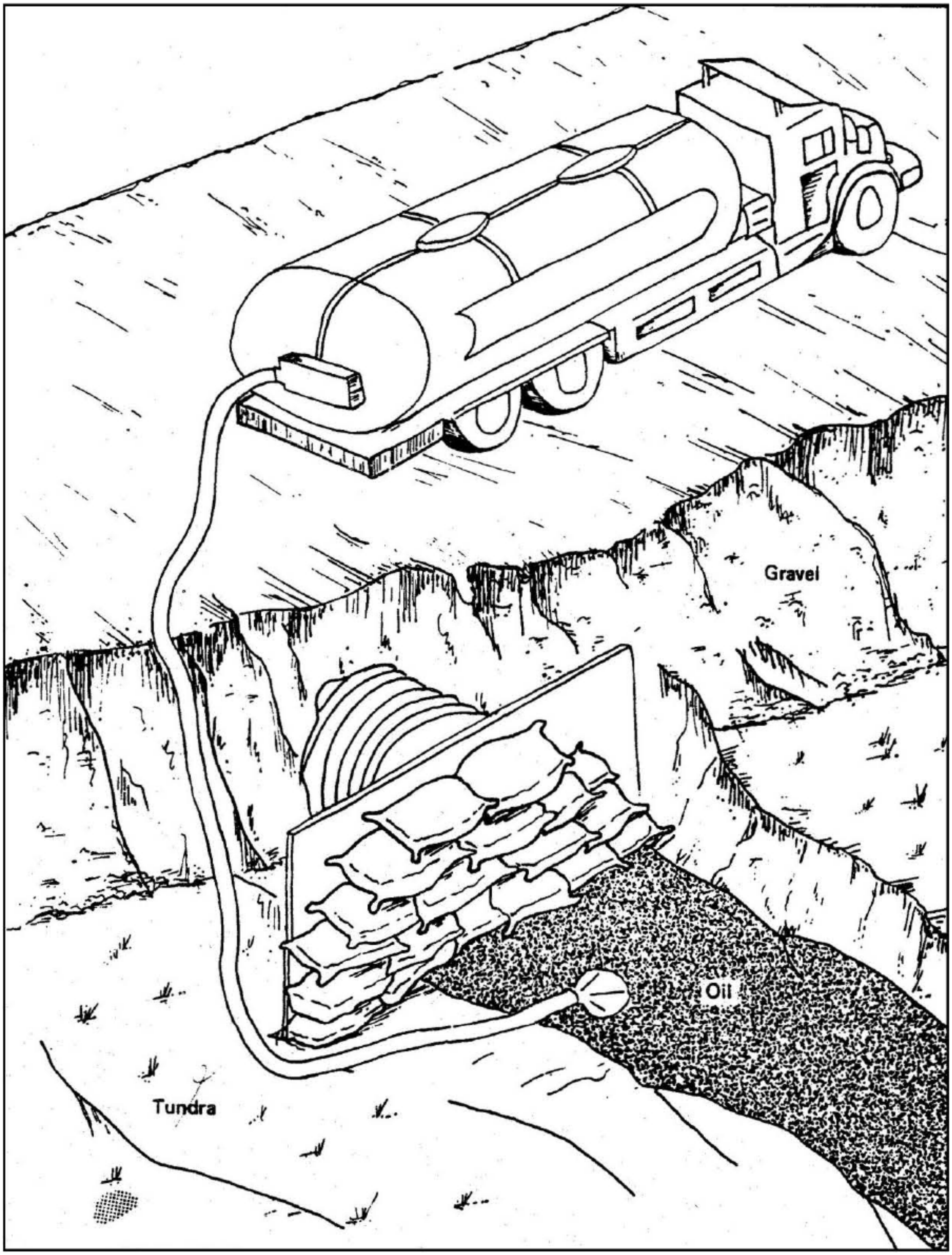


Table 2.5-1.
Logistical Requirements for Use of Vacuum Truck

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

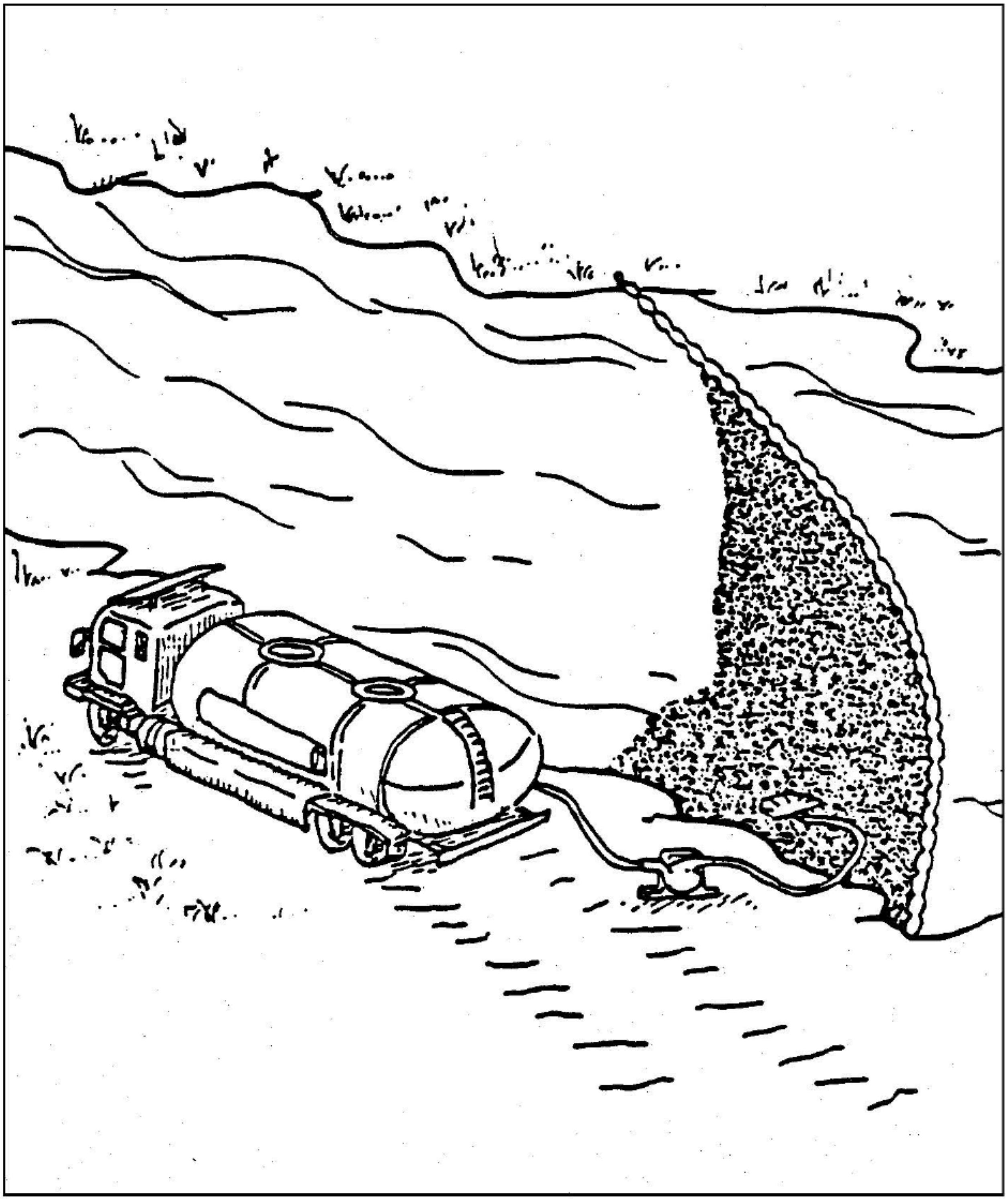


Table 2.5 2

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

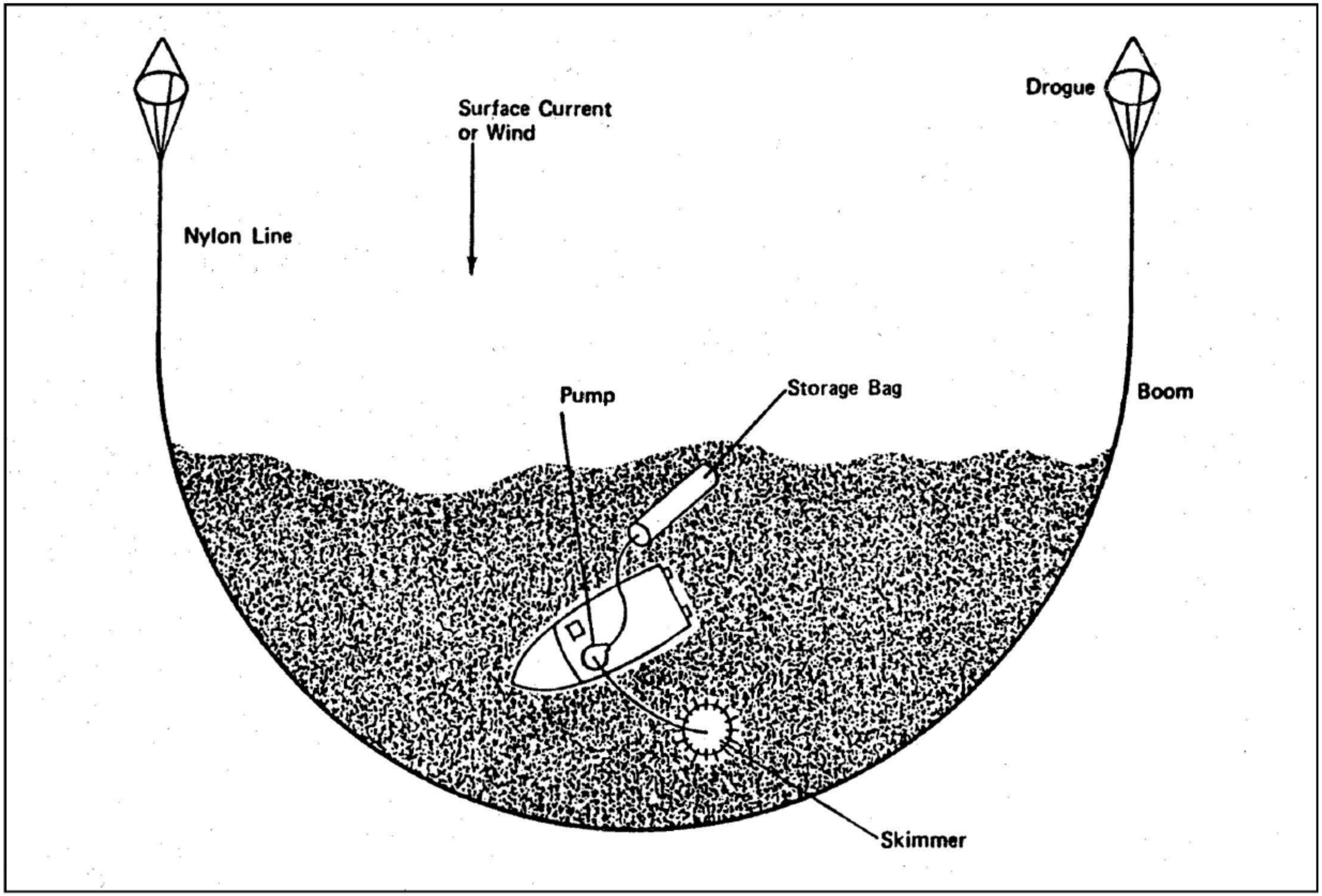
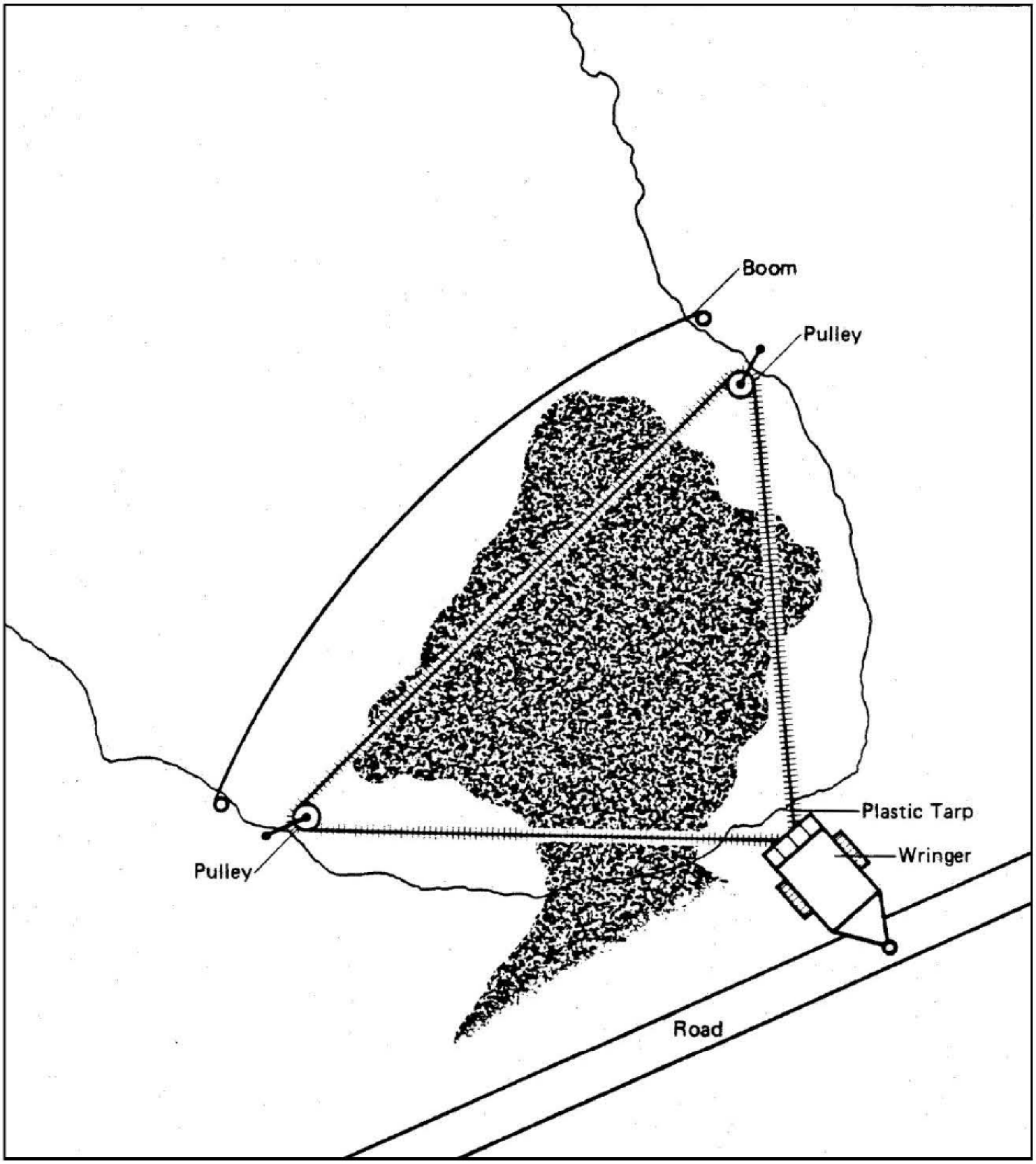


Figure 2.5-4
Endless Rope Skimmer



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 con-centrate 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 con-centrations 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

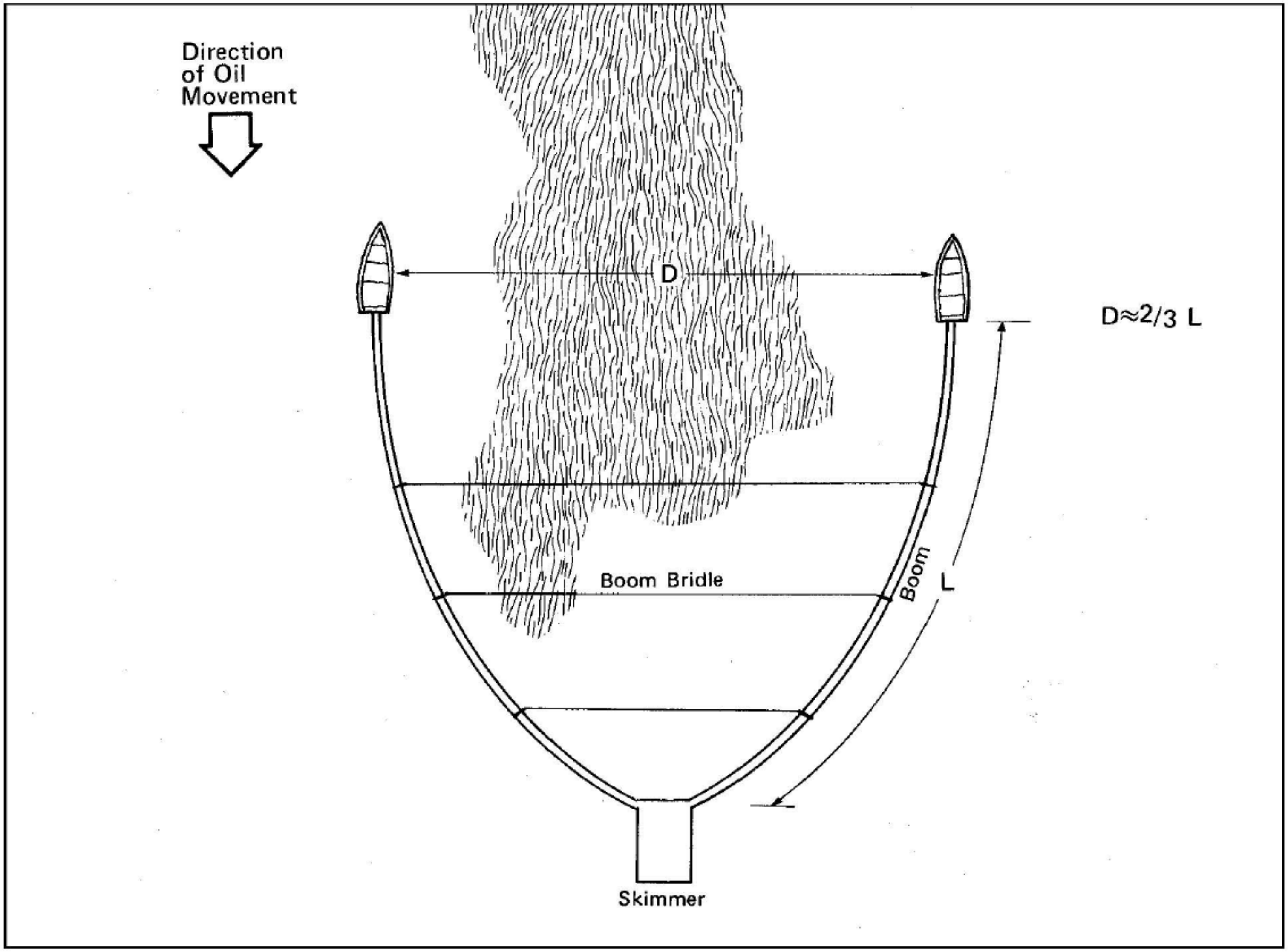


Figure 2.5-6

Skimming a Larger Slick

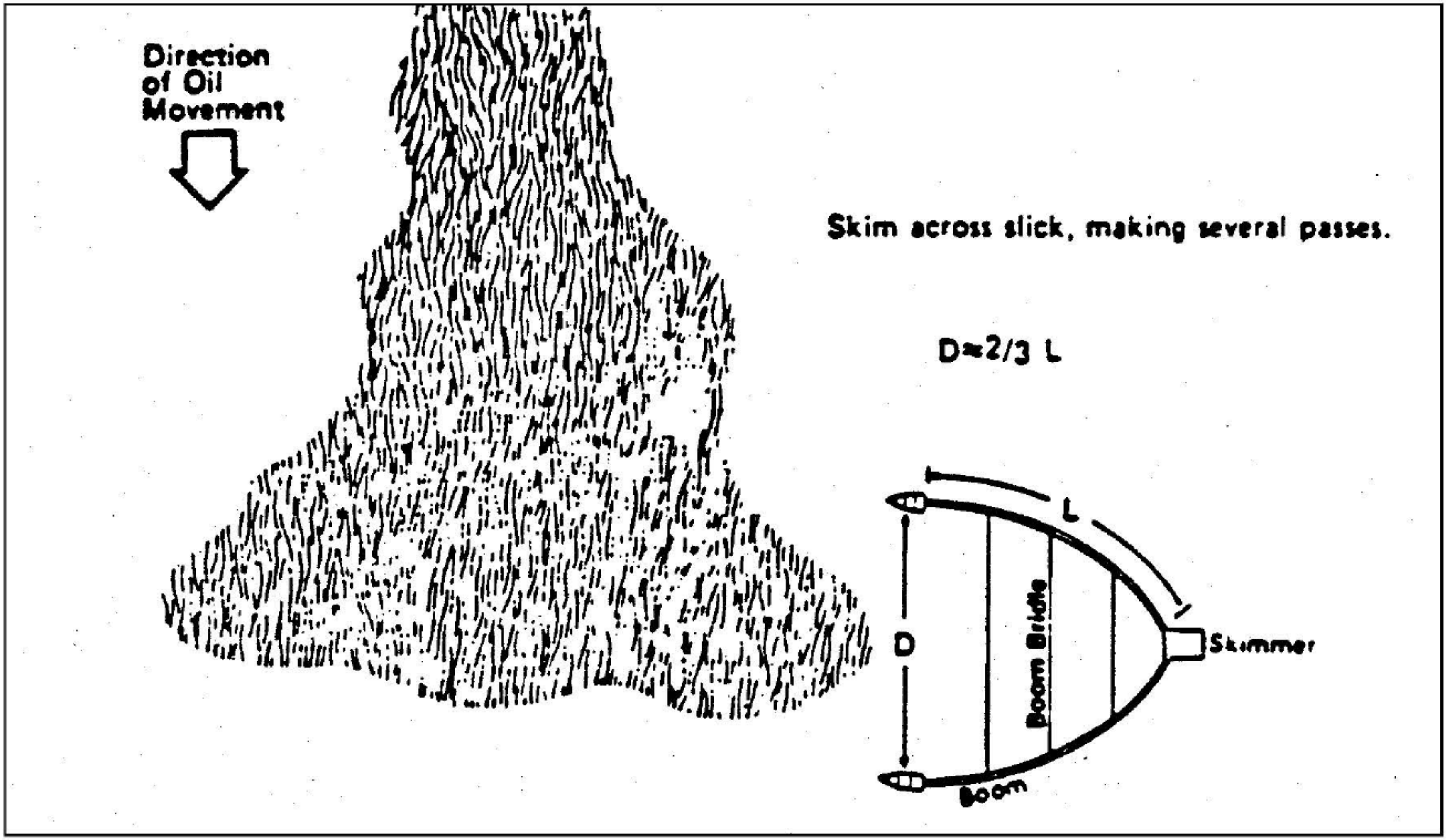


Figure 2.5-7

Skimming with Single Boom

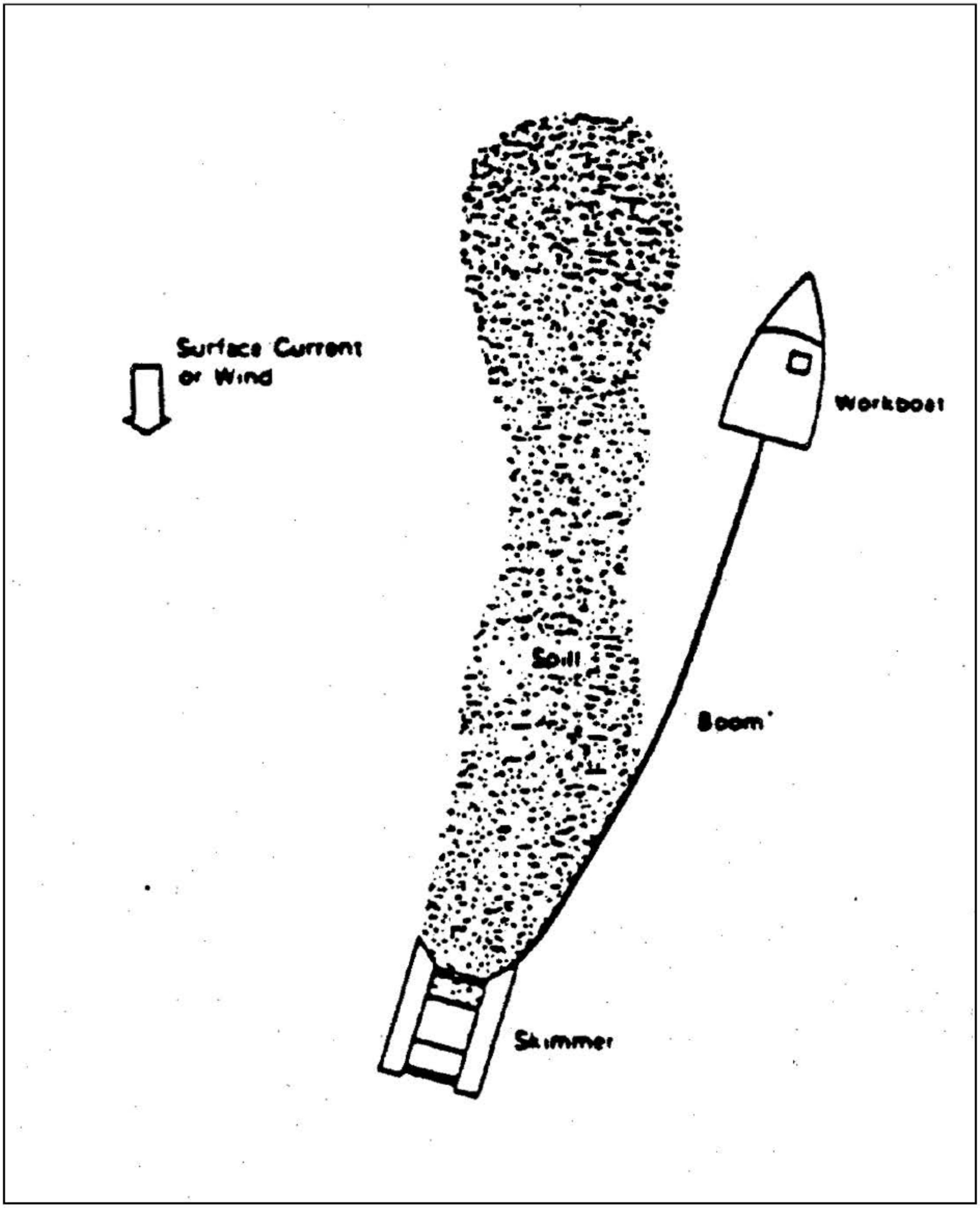
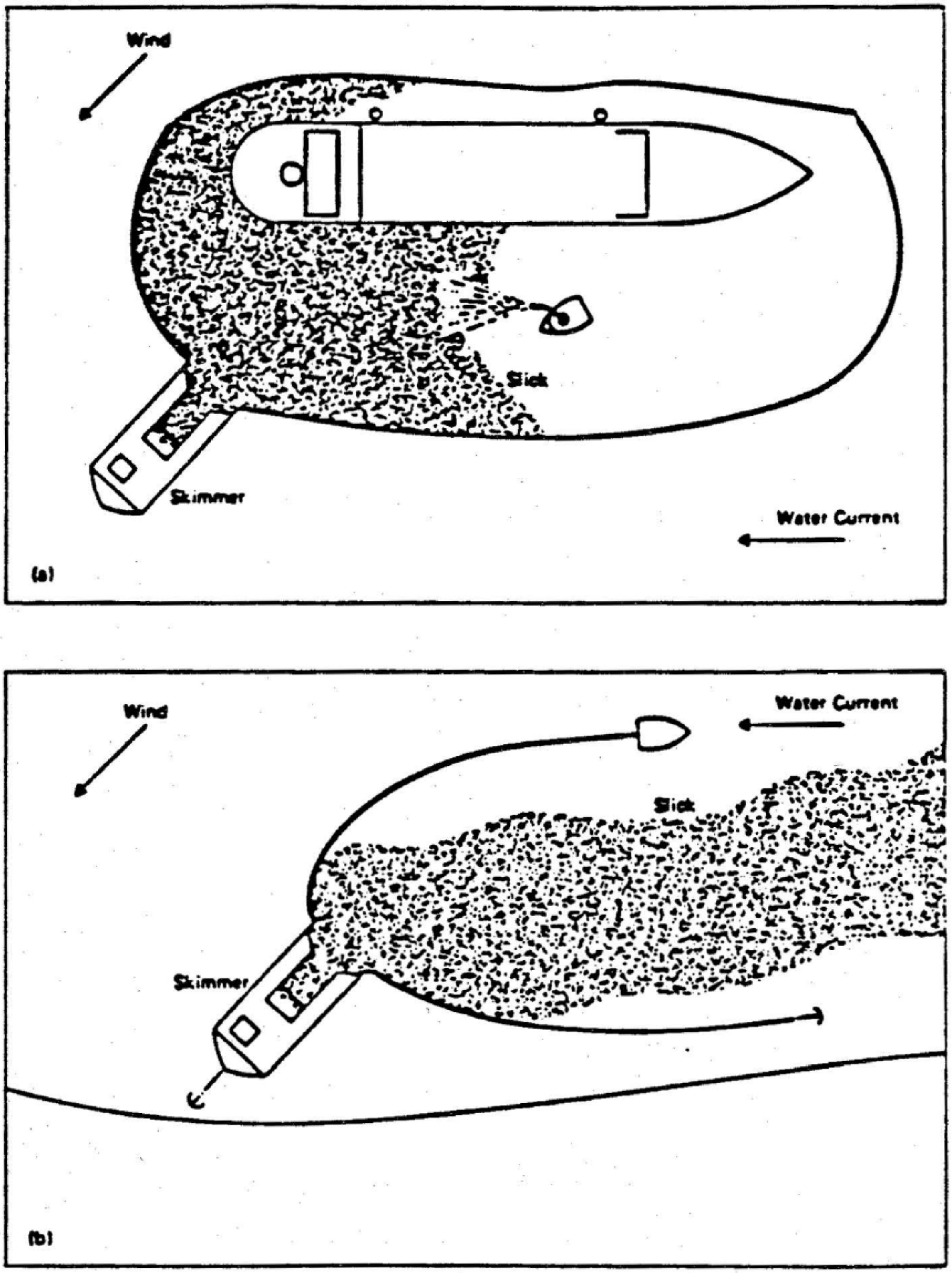


Figure 2.5-8

Use of Skimmers in Stationary Mode



2.5.4 Trawls

Objectives. Utilize trawl nets to recover uncontained spills of oil that have solidified on the water.

Limitations. Size of modified oil mass, degree of solidification, and adversity of environmental conditions.

General Instructions. Two vessels tow a trawl or fishing net between them as shown in Figure 2.5-9. The net is deployed in front of the advancing slick and the vessels proceed slowly up each side, trapping the oil in the net. When the net is full, it is brought on deck by one of the vessels. If space permits, debris boxes should be placed on deck to receive the recovered oil.

Logistics. The logistical requirements for recovering solidified oil with trawl nets will vary with the quantity spilled. In general, each recovery unit should consist of two 40 to 60 foot work boats or fishing vessels, one large trawl or fishing net, and 1 or 2 debris boxes, depending on the available deck space.

Variations. Spills of solidified oil can also be recovered by placing a frame conveyor with a mesh belt inside the boomed area. The conveyor is mounted at an angle of 25° from the horizontal on the side of a work boat (30-40 feet long) or barge. Oil picked up by the conveyor is directed by a side chute mounted at the top of the conveyor to a debris box on the deck of the vessel or barge, as shown in Figure 2.5-10. Certain commercial skimmers can also be used to recover floating solidified oil. These skimmers use a conveyor system with a nylon mesh belt and removable foam filter pads. The filter pads, used to recover liquid oil, can be removed so that the mesh belt can recover solidified oil or floating debris.

Figure 2.5-9

Cleanup of Solidified Oil with Trawl Net

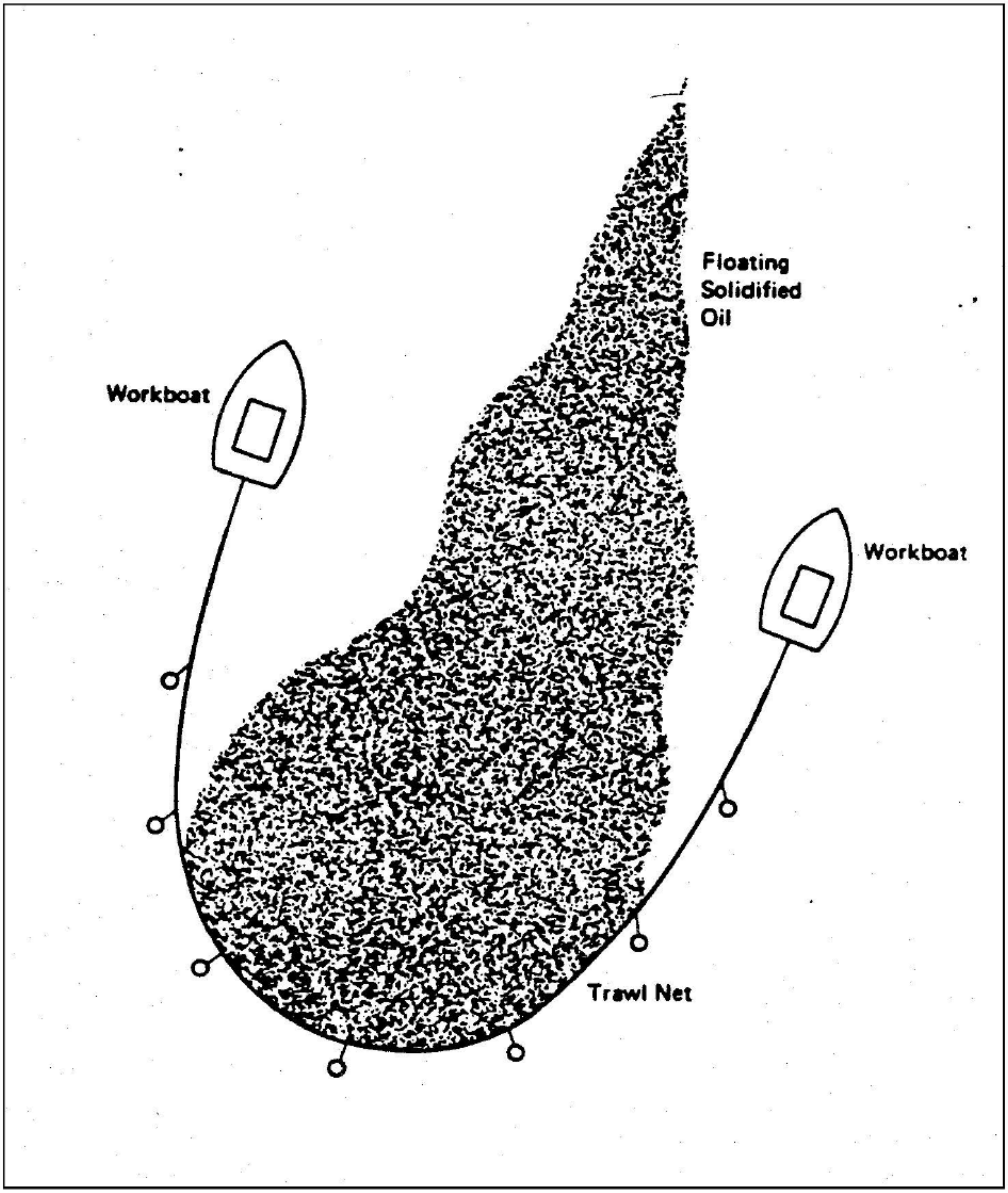
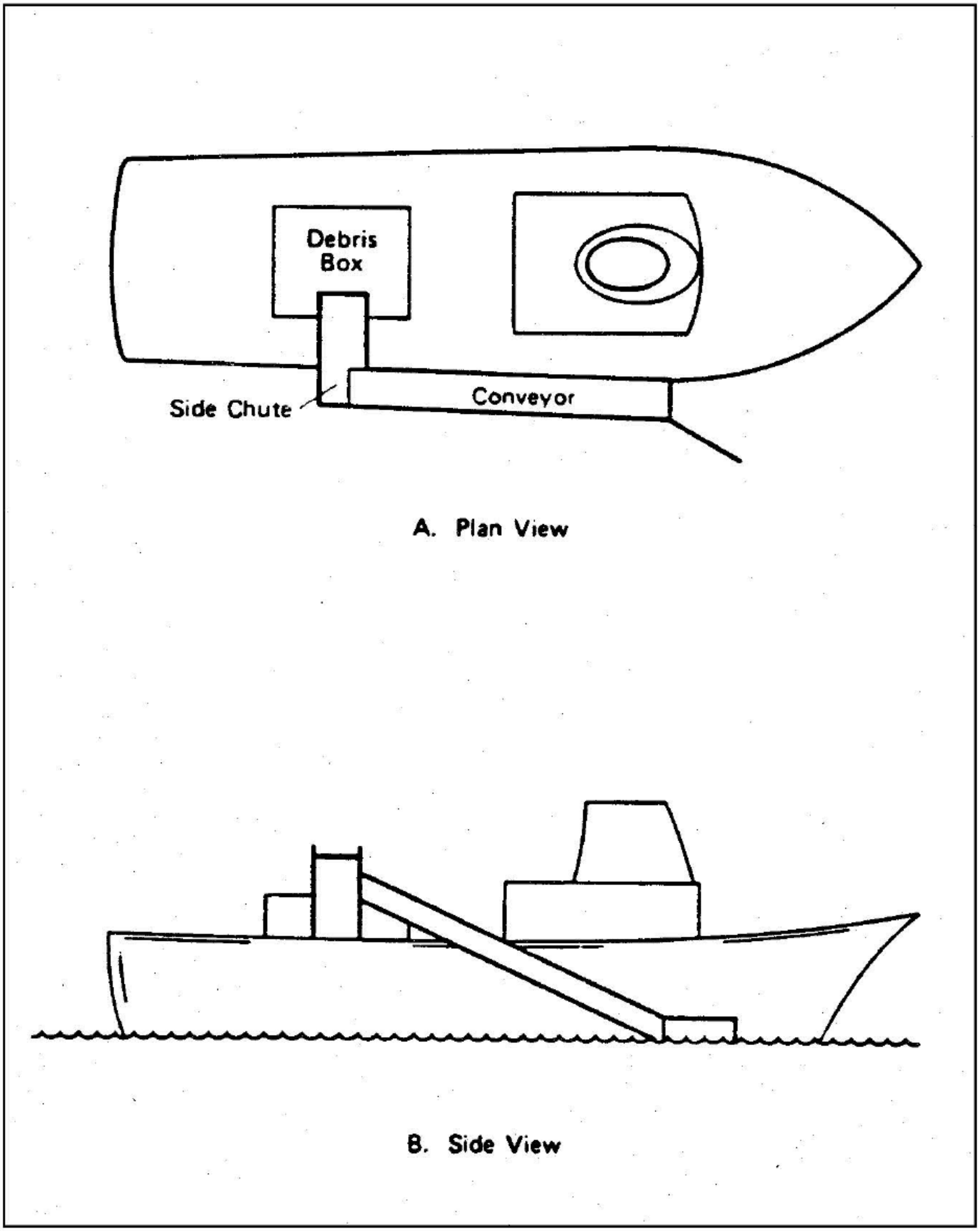


Figure 2.5-10.

Vessel Mounted Oil Recovery Conveyor



2.5.5 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.

THIS PAGE INTENTIONALLY LEFT BLANK

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 are 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

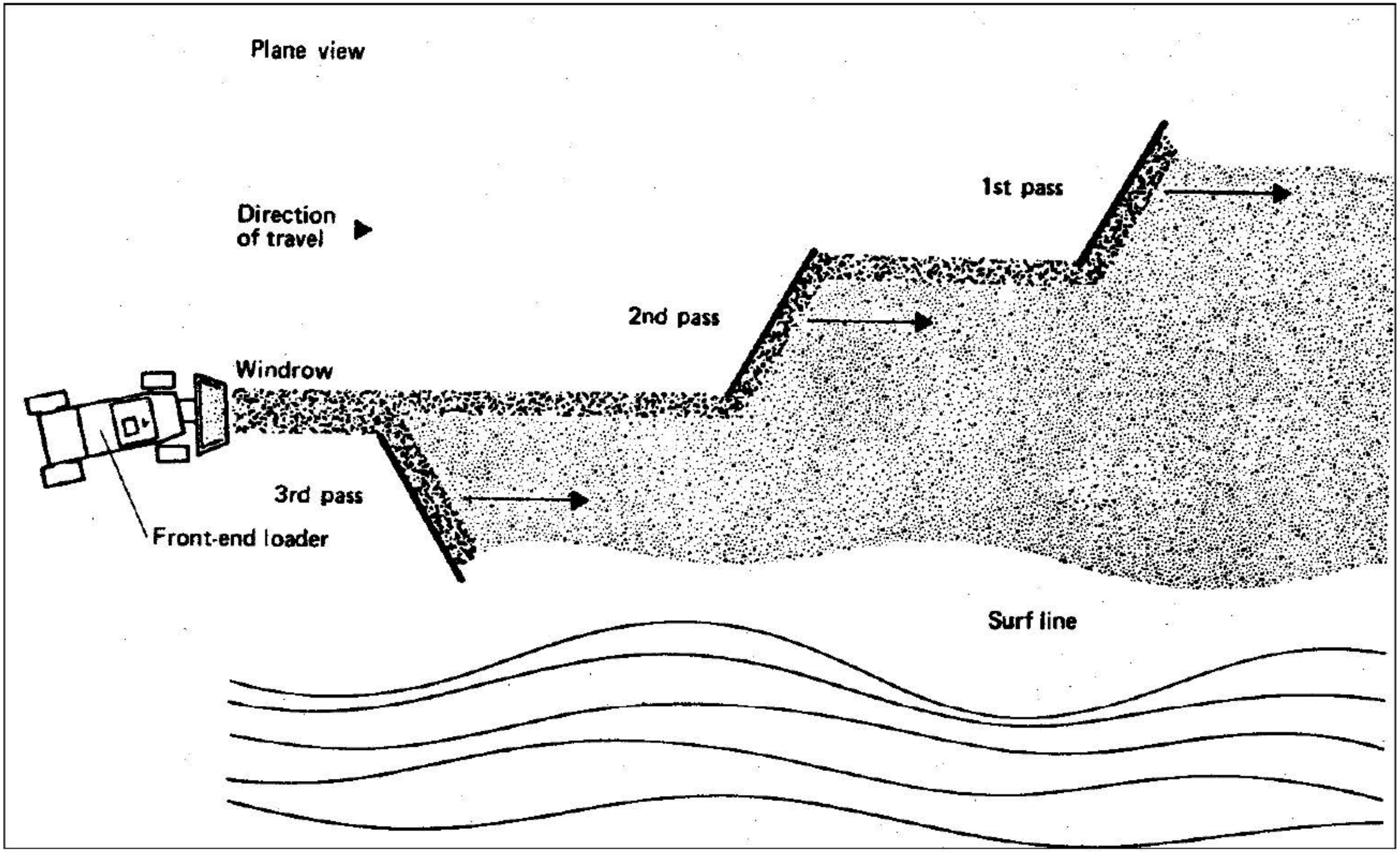
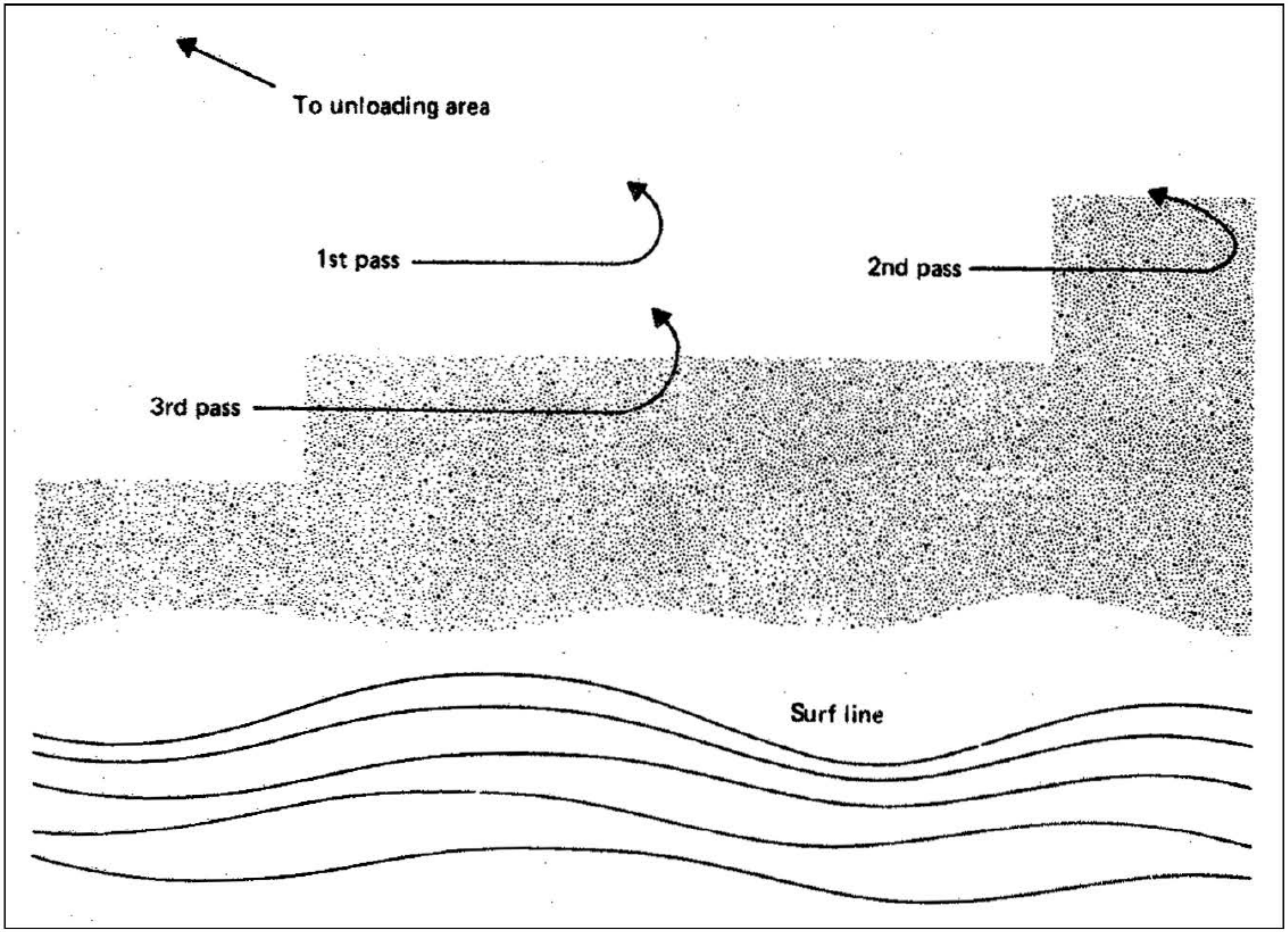


Figure 2.6-2

Operation Pattern for a Motorized Elevating Scraper



<u>Front-End Loaders</u>. 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.

<u>Hauling Trucks</u>. 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.

<u>Discing</u>. 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.

<u>Logistics</u>. 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.

<u>Variations</u>. None.

Figure 2.6-3

Operational Sequence for a Front-End Loader

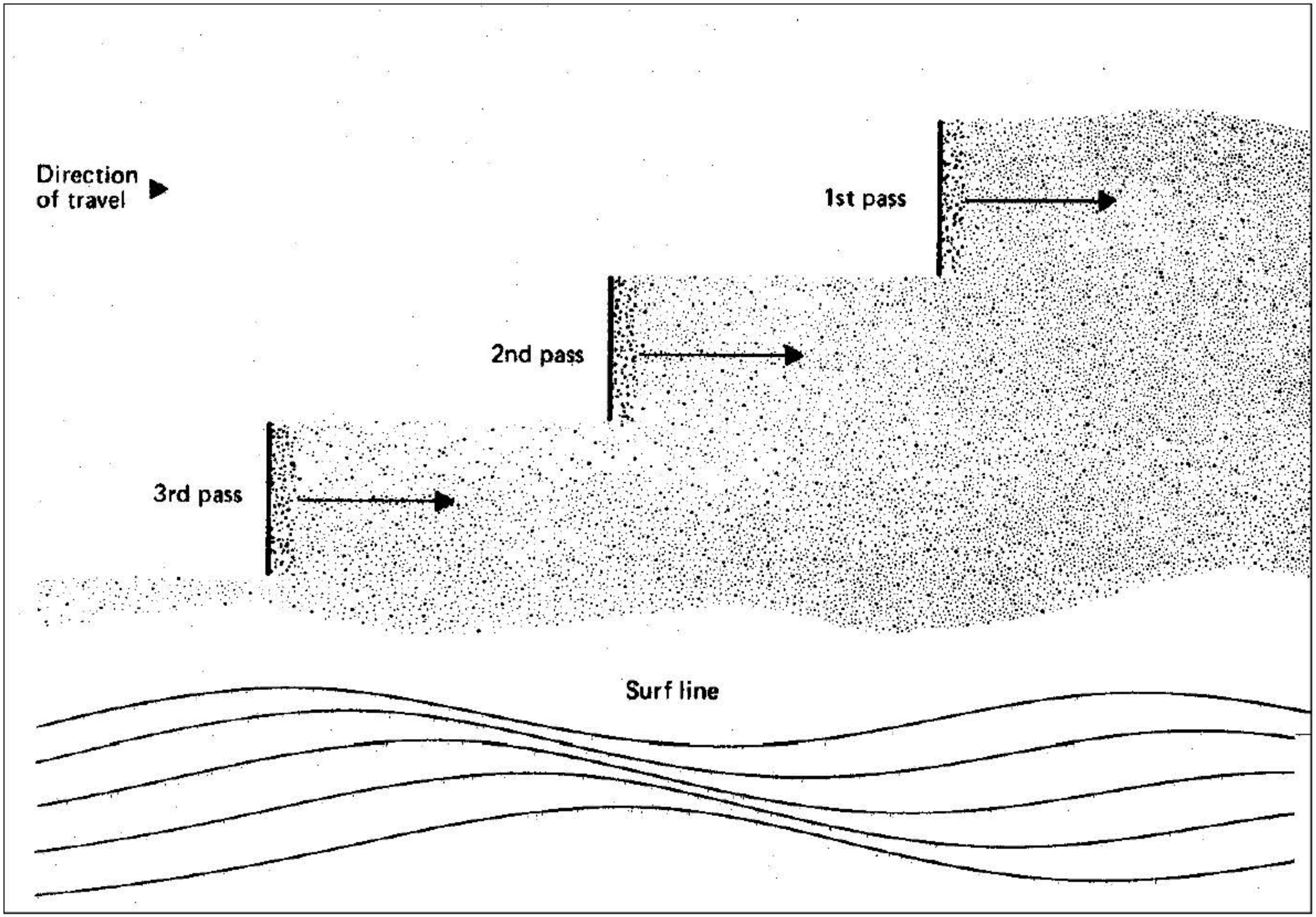


Table 2.6-3

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

<u>Objectives</u>. 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.

<u>Limitations</u>. Accessibility and substrate erosion potential.

<u>General Instructions</u>. 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.

<u>Logistics</u>. 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.

<u>Variations</u>. 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

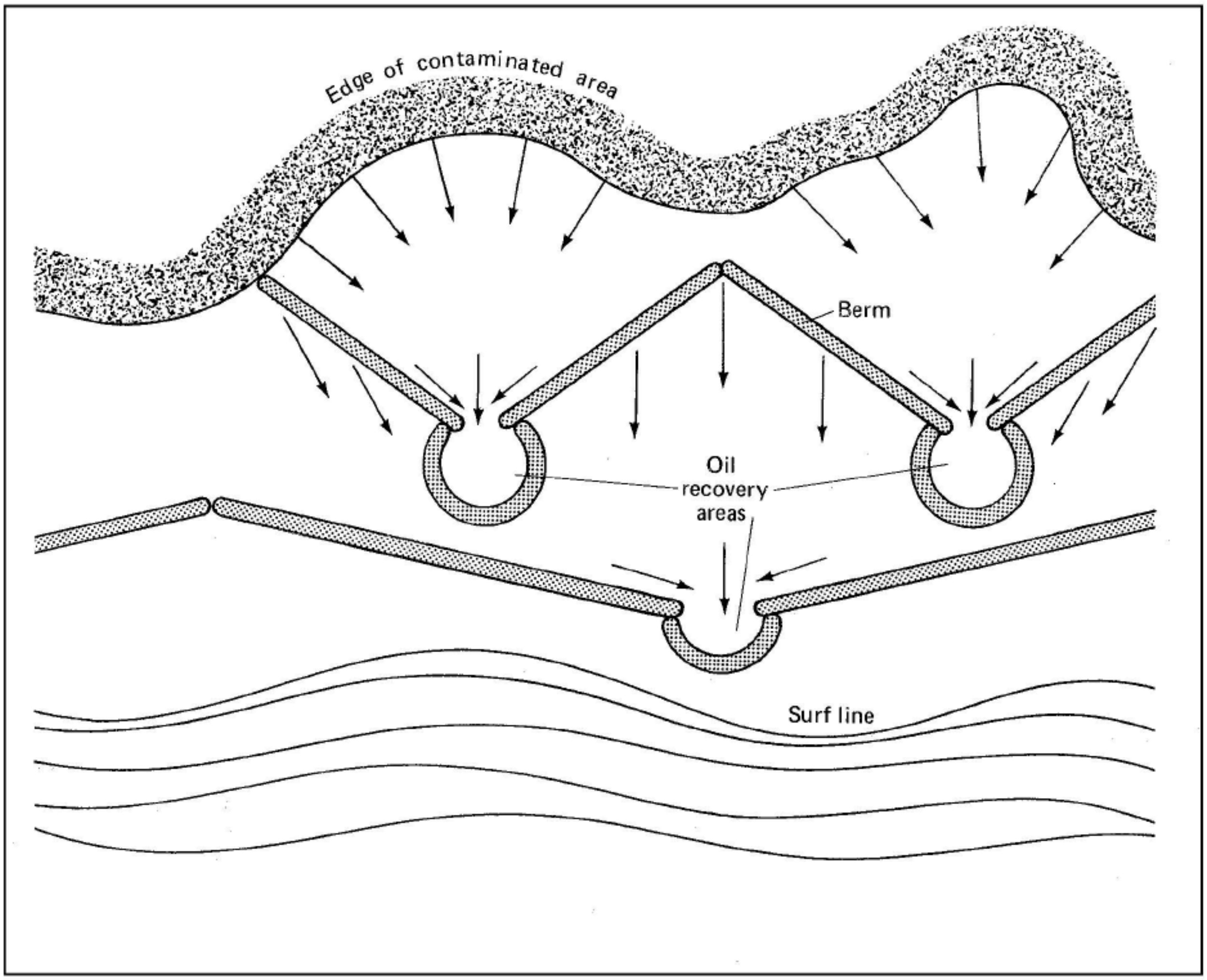


Table 2.6 4

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

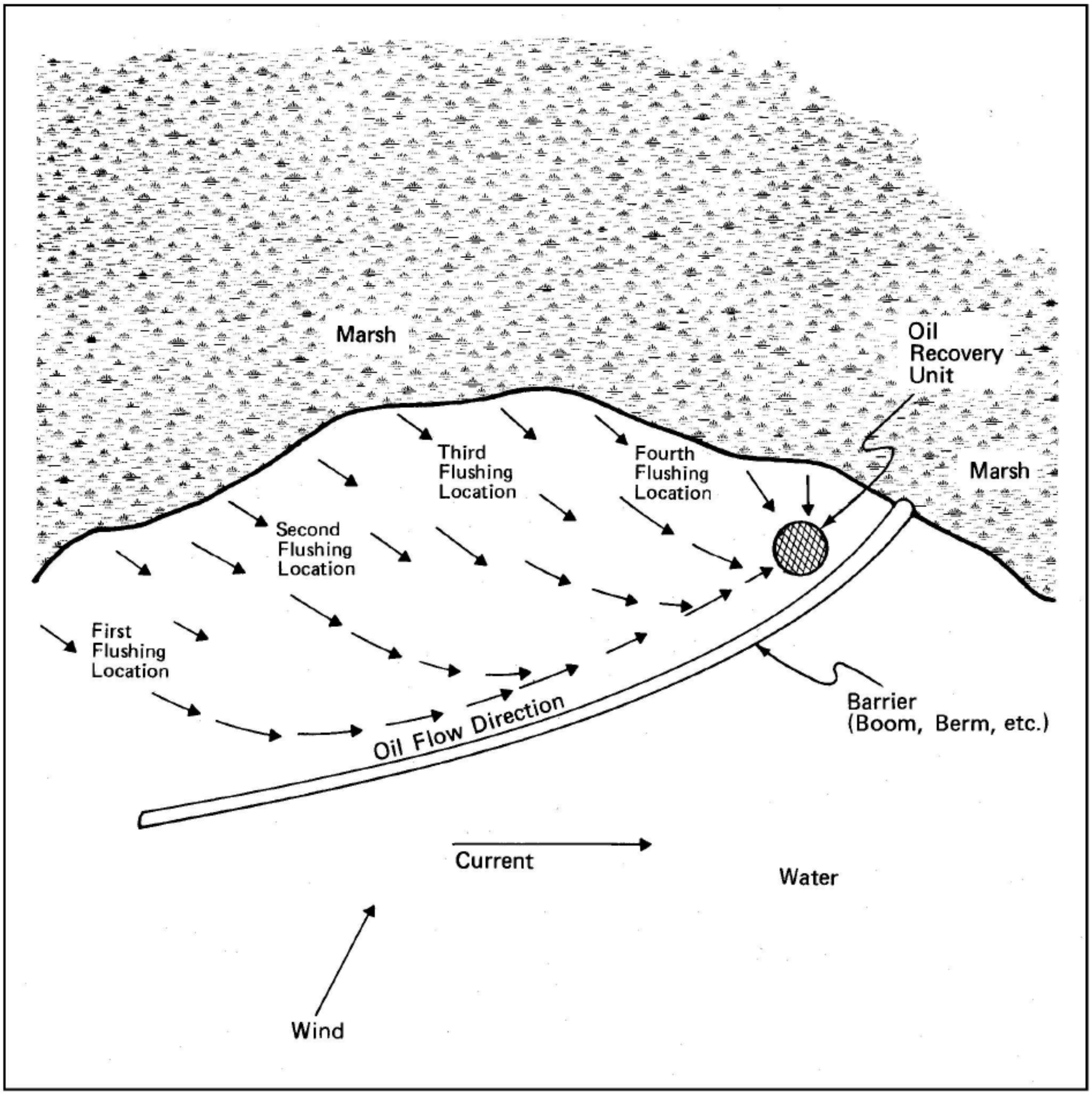


Table 2.6-5

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.		

aFor 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 Mangrove Types/Sensitivities

For oil spill response application, mangroves can be divided into two basic types, the fringing Red Mangroves, which can be distinguished by their fork-like prop roots and the interior Black Mangroves which can be distinguished by their pencil-like aerial roots (pneumatophores) which protrude from the substrate. In both cases, the roots contain pores which transmit gases and fluids and which can allow toxic components of the oil to enter the plants and which are sensitive to clogging by oil. Both types of mangrove environments are extremely sensitive to physical damage, a fact which limits the desirability of most response actions.

Oil Movement

Spills released into mangrove environments can be expected to be driven by a variety of mechanisms including wind and tidal action. On a flood tide, flow toward the mangrove interior will be initiated through natural and artificial canals and spread into interior areas. On ebb tide, drainage will occur through these canals, leaving residual material in the interior. If the sediments are dry, or tides are decreasing, penetration of spilled materials into sediments can occur. Spilled material can also be incorporated in sediment accumulations, if present.

Protective Actions

Protective actions should concentrate on major mangrove drainage canals, to reduce spill migration into interior areas. Conventional boom, sorbent boom and filter fences are appropriate for such application.

The mangrove interior is often inaccessible and extremely susceptible to physical damage. Nonetheless, it is also extremely sensitive to refined product exposure. In open areas certain measures have been proven successful in limiting spill movement. These measures include deployment of roll sorbent or overlapping sorbent pads ahead of an advancing spill. Use of sorbent materials is attractive in that they may be applied rapidly by one or two individuals with minimal environmental disruption. To be successful, sorbent placement must avoid surface irregularities such as mangrove pneumatophores and small plants.

Cleanup Procedures

The following procedures should be considered in determining the appropriate cleanup methodologies:

1. Recovery of free product should be maximized. Recovery procedures will normally concentrate on skimming and vacuum recovery from water where depth permits. In very shallow water, sumps may be constructed to permit the operation of skimmers, or vacuum skimmer heads may be utilized. Free product can also be mobilized and directed to collection points through the use of low pressure water streams. These techniques have the advantage of being used with no or minimal direct physical contact. In using water flushing techniques, it is critical to maintain low pressure and application angle to minimize sediment erosion. Water should be flooded at the point of highest elevation to float material to a lower

collection point for recovery. The flooding procedure may also be used to float oil out of animal burrows.

2. Physical activities in the mangrove environment should be restricted or completely eliminated. Physical wiping of prop roots or pneumatophores should be avoided, although use of sorbents may be appropriate if they can be recovered.

3. In most cases, attempts to conduct cleanup in the mangrove environment will result in more damage than allowing the spilled material to degrade naturally. If it is not apparent that natural processes will provide adequate cleanup, bioremediation procedures may be appropriate. Advice regarding bioremediation and mangrove cleanup in general may be obtained from consultants.

2.6.7 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.

2.6.8 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 non-recreational, 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, non-recreational 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.

2.6.9 Group 5 (Sinking) Oils

Group 5 oils are typically heavier than ambient water and will sink. Depending on specific gravity relationships, these oils may sink directly to the bottom, or may sink to a depth at which their specific gravity matches that of the water. The latter phenomena is common in estuarine environments where distinct tidal density gradients exist.

Where oils sink directly to the bottom they will tend to migrate in the direction of net bottom sediment movement and/or collect in depressions. Oil entrained in the water column will tend to follow general flow or tidal circulation patterns.

Detection and Tracking. No standardized procedures for tracking submerged or sunken oil have been developed. In some cases oil on the bottom or in the water column will be detectable using depth-sounding or fish-finding electronics. In other cases collection of grab samples or visual (diver) observations may be required.

Containment and Control. No proven techniques for containment and control of submerged oil have been identified during the preparation of this plan.

Recovery. No proven techniques for the recovery of submerged oil have been identified during the preparation of this plan. However, some success has been achieved using dredges. Each occurrence will require specific evaluation to determine the appropriate equipment and procedures for recovery (if any).

Table 2.6-7

Logistical Requirements for Assisted Natural Recovery

Item	50 ft. Wide Area	150 ft. Wide Area	Cleaning Rate
<u>Equipment</u>			
• 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
<u>Personnel</u> - 1 operator for each piece of equipment and 1 supervisor.			
<u>Support</u>	**<u>Diesel Fuel Requirements</u>**		
• Tracked-type tractor	2-1/2 - 9 gallons/hr		
• Bulldozer	4 - 14 gallons/hr		
<u>Access requirements</u> - heavy equipment, light vehicular, barge, or landing craft.			

THIS PAGE INTENTIONALLY LEFT BLANK

2.7 INCIDENT ACTION PLAN FORMS

Forms on CD

THIS PAGE INTENTIONALLY LEFT BLANK

PART III
SUPPLEMENTAL INFORMATION

HAWAIIAN ELECTRIC COMPANY, INC.
KAHE GENERATING STATION
KAHE PIPELINE
KAPOLEI, HAWAII

Submitted: May 2012

THIS PAGE INTENTIONALLY LEFT BLANK

PART III
TABLE OF CONTENTS
SUPPLEMENTAL INFORMATION

3.1 FACILITY DESCRIPTION AND OPERATION OVERVIEW

The Kahe Generating Station is a steam electric power plant with a net generating capacity of 658 megawatts. Low sulfur fuel oil (LSFO) for the facility's six boilers is delivered via pipeline from the Barbers Point Tank Farm. LSFO is stored in four storage tanks with a total capacity of approximately 475,000 barrels (bbls). At peak load, the Kahe Generating Station could burn 18,000 bbls of LSFO daily.

As early as 2014 the facility may store and burn biofuel (i.e., biocrude) in addition to LSFO. The biofuel will physical properties similar to LSFO.

The Kahe Generating Station began operations in 1963. To meet the increasing demands for power, HECO has expanded its operations at the Kahe Generating Station over the years. The facility currently operates six steam turbine generators (Units 1 through 6).

The facility contains approximately 475 acres within its fenced boundary, located in Kahe Valley, on the west coast of Oahu (Figure 3.1-1). As shown in Figure 3.1-2, the Farrington Highway and Pacific Ocean form the western boundary of the facility. Open undeveloped land surrounds the north, east and south sides of the facility. A seasonal stream runs along the northern boundary. The facility is not located within a wellhead protection area. Facility Information is presented in Table 3.1-1.

The facility began operations with the completion of Unit 1 in 1963. Unit 2 followed shortly thereafter in 1964. In 1970, Unit 3 was added followed by the addition of Unit 4 in 1972. Units 5 and 6 were added in 1974 and 1981 respectively. Service dates for aboveground oil storage tanks are listed in Table 3.1-2.

Table 3.1-1
Facility Information Form

Facility Name:	**Kahe Generating Station**		
Facility Address:	**92-200 Farrington Highway, Kapolei, Hawaii 96707**		
County:	**Honolulu**	Phone Number:	**(808) 543-4100**
Latitude:	(b) (7)(F), (b) (3) [redacted]	Longitude:	(b) (7)(F), (b) (3) [redacted]
Wellhead Protection Area:	**No**	Qualified Individuals:	**See § 3.3**
Owner/Operator:	**Hawaiian Electric Company, Inc.**		
Owner Address:	**P.O. Box 2750, Honolulu, Hawaii 96840-0001**		
County:	**Honolulu**	Phone Number:	**(808) 543-4673**
Date of Oil Storage Start-up:	**1963**	Current Operations:	**See §3.1 above**
Expansion Dates:	**See § 3.1 above**	NAICS:	**221112**

3.1.2 Oil Storage Tanks and Secondary Containment

Aboveground oil storage tanks are constructed of steel in compliance with contemporary API specification and industry standards. Secondary containment is provided by impervious dikes around each of the aboveground oil storage tanks. Secondary containment dikes are designed to provide capacity for the entire contents of the largest single tank plus freeboard to allow for precipitation.

Smaller containers, such as 55-gallon drums, are staged on containment pallets. Specific tank information is shown on Table 3.1-2.

3.1.3 Facility Drainage

Drainage from diked storage areas is restrained by drain valves which are maintained in the closed position. Valve handles are removed or locked to prevent unsupervised drainage of the diked areas. When sufficient rainwater has accumulated within the diked area, the water is visually inspected for any film, sheen or discoloration due to the presence of oil. If detected, oil is removed prior to discharge of rainwater. The drain valves are then opened and the rainwater is allowed to drain under responsible supervision. Valves are resealed and locked, or resealed and valve handles removed following drainage. Records are maintained of secondary containment drainage. Rainwater accumulated in the LSFO berm areas is allowed to percolate into the ground.

Surface drainage over the site in general, is to the storm drains as indicated on Figure 3.1-2. Storm drain blocking techniques can be employed if necessary to prevent a potential spill from reaching navigable waters. Facility drainage systems are engineered to prevent oil from reaching navigable waters in the event of equipment failure or human error at the facility. Drains from power generation operations areas are routed through oil interceptor sumps where oil releases can be contained and/or diverted to wastewater pond 1A.

The drainage in the vicinity of the tank truck unloading areas does not flow into a catchment basin or treatment facility. As a preventive measure, nearby storm drain inlets are closed or covered during unloading to prevent a potential discharge from reaching navigable waters.

Table 3.1-2
List of Tanks

Tank Designation	High & Low Level Alarms	Code(1)	Substance Stored	Maximum Capacity (gal.)(2)	Type	Year	Average. Daily Quantity (gal.)(3)	Secondary Containment Capacity (gal)
Tank 11	H,L	A	LSFO/biofuel	(b) (7)(F), (b) (3) [redacted]	Fixed	1961	(b) (7)(F), (b) (3) [redacted]	[redacted]
Tank 12	H,L	A	LSFO/biofuel	[redacted]	Fixed	1961	[redacted]	[redacted]
Tank 13	H,L	A	LSFO/biofuel	[redacted]	Fixed	1971	[redacted]	[redacted]
Tank 14	H,L	A	LSFO/biofuel	[redacted]	Fixed	1975	[redacted]	[redacted]
Blackstart	No	A	Diesel	[redacted]	Fixed	1986	[redacted]	[redacted]
U/G Gasoline	No	B	Gasoline	[redacted]	Fixed	1990	[redacted]	[redacted]
Kerosene (out of service)	No	A	Kerosene	[redacted]	Fixed	NA	[redacted]	[redacted]
Emergency Power 1 & 2 (Diesel Fuel)	None	A	Diesel	[redacted]	Fixed	NA	[redacted]	[redacted]
1 & 2 (Used lube oil)	None	A	Lube Oil	[redacted]	Fixed	1963	[redacted]	[redacted]
1 & 2 (Clean lube oil)	None	A	Lube Oil	[redacted]	Fixed	1963	[redacted]	[redacted]
3 & 4 Lube A (Used)	None	A	Lube Oil	[redacted]	Fixed	1970	[redacted]	[redacted]
3 & 4 Lube B (Clean)	None	A	Lube Oil	[redacted]	Fixed	1970	[redacted]	[redacted]
3 & 4 Ignitor	None	A	Diesel	[redacted]	Fixed	1970	[redacted]	[redacted]
5 & 6 Lube A (Used)	None	A	Lube Oil	[redacted]	Fixed	1974	[redacted]	[redacted]
5 & 6 Lube B (Clean)	None	A	Lube Oil	[redacted]	Fixed	1974	[redacted]	[redacted]
5 & 6 Ignitor	None	A	Diesel	[redacted]	Fixed	1974	[redacted]	[redacted]
New 5 & 6 Ignitor	None	A	Diesel	[redacted]	Fixed	2011	[redacted]	[redacted]
Test Tank (out of service)	None	A	LSFO	[redacted]	Fixed	1961	[redacted]	[redacted]
Fire Pump Diesel Tank	None	A	Diesel	[redacted]	Fixed	2004	[redacted]	[redacted]
Total Oil Storage				[redacted]	**Total Secondary Containment**			(b) (7)(F), (b) (3) [redacted]
				[redacted]				
Chemical Tanks				[redacted]				
Water Treatment Acid Tank	No	A	Sulfuric Acid	[redacted]	Fixed	UKN		
Water Treatment Caustic Tank	No	A	Caustic Soda	[redacted]	Fixed	UKN		
Wastewater Caustic Tank	No	A	Caustic Soda	[redacted]	Fixed	UKN		

(1) A = Aboveground Tank
B = Below Ground Tank

(2) Capacities are maximum fill level

(3) Quantities are safe fill level

Figure 3.1-1
Location Map

Figure 3.1-2
Facility Layout

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

[redacted]

3.1.4 Kahe Pipeline

The Kahe Pipeline supplies the Kahe Generating Station storage tanks with low sulfur fuel oil (LSFO) from the Barber's Point Tankfarm. Biofuel with physical properties similar to LSFO may also be transported through the pipeline. The pipeline is owned by HECO, and operated by Chevron. Normally, the Kahe pipeline system operates on a continuous basis. The pumping rate varies between 350 and 1000 barrels per hour (bph) depending on the power plant's need. The rate is normally specified by the Operations Coordinator. (b) (7)(F), (b) (3) [redacted]. Discharge detection should occur within less than five minutes. With the assistance of Chevron, HECO will take the lead for response, abatement, and cleanup of pipeline discharges.

Information to address the requirements of the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) is presented in Appendix D of this FSRP.

The pipeline is approximately five miles long and is located in Honolulu County, comprising a single response zone. The pipeline routing is shown on Figure D-1 in Appendix D.

The line is an 8.625 inch (outside diameter), grade X-42, schedule 40, with a wall thickness of 0.322 inches, corrosion coated with a mixture of Fusion Bonded Epoxy and conventional tape wrap, and has 2" of urethane foam insulation under a HDPE jacket for the first 2,962 feet. At certain location (i.e., waterways, railroads, etc.) the wall thickness is .500 inches. The pipeline is also cathodically protected. The total line displacement is 1,700 bbls. (b) (7)(F), (b) (3) [redacted].

The majority of the pipeline is buried. Pipeline cover varies along its length, averaging four feet. The pipeline was laid in 1958, partially rerouted in 1982 and partially rerouted again in 2004. It was constructed and has been repaired and/or replaced in accordance with applicable regulations, specifications and recommended practices. There are no breakout tanks in the line. The maximum operating pressure is 1,315 psig at normal operating temperature (190° F to 200° F).

Additional information and operating procedures are presented in the *Pipeline Operation and Maintenance Manual*.

3.1.5 Spill Detection

HECO personnel are on duty 24 hours a day, seven days a week. Daily visual inspections are performed by all workers. Operators make hourly rounds for generating units and associated piping. Rounds in the tank farm area are conducted every two hours. A discharge from facility storage tanks or piping would be noted during visual inspections or when a pressure loss is noted in gauges and in differential pressure between the pump and endpoint gauges. Tank truck unloading is conducted under constant supervision by the driver. Any discharges detected would initiate the mitigation procedures described in this plan.

There are no automated discharge detection systems at the Kahe Generating Station, however, several tanks are provided with high or low level alarms as indicated on Table 3.1-2.

3.1.6 Facility Self-Inspection

Operations at the Kahe Generating Station are geared toward maintaining the safety of personnel and the environment. Prevention of a potential discharge is stressed as a high priority. Prevention procedures include the placement of secondary containment structures around aboveground storage tanks, proper design of facility drainage and a strict inspection and maintenance program. Repairs to tanks, piping, valves and other related equipment are initiated promptly as indicated by the magnitude of the problem.

Tank Inspection

The tank inspection checklist is presented on Figure 3.1-3

Response Equipment Inspection

Facility-owned response equipment is limited to sorbent materials and personal protective equipment (PPE). Equipment locations are shown on Figure 3.1-2. Facility-owned response equipment is inspected monthly using the checklist presented on Figure 3.1-4. Contracted oil spill response equipment is tested and maintained by OSROs as described in Section 3.6.

Secondary Containment Inspection

The checklist for secondary containment inspections is presented on Figure 3.1-3.

Pipeline Discharge Detection

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

[redacted]

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

[redacted]

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

[redacted]

Figure 3.1-3
Monthly Inspection Checklist

Facility: Kahe Date of Inspection: ________________ Performed By: ____________________

Tank No.	LSFO 11	LSFO 12	Test Tank	LSFO 13	LSFO 14	Black-Start
Check Tank. Are there any:	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Drip Marks						
Discoloration of tanks						
Puddles containing spilled or leaked material						
Corrosion (rusting, pitting)						
Cracks						
Localized dead vegetation						
Damaged bolts, rivets, or seams						
Defective level gauges and alarms						
Obstructed vents						
Check Foundation. Are there any:	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Cracks						
Discoloration						
Puddles containing spilled or leaked material						
Settling						
Gaps between tank and foundation						
Damage caused by vegetation roots.						
Check Piping. Are there any:	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Droplets of stored material						
Discoloration						
Corrosion (rusting, pitting)						
Bowing of pipe between supports						
Leaking valves, flanges, and gaskets						
Localized dead vegetation						
Check Level Sensing Device.	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N
Is the level sensing device malfunctioning?						
Check the dike, berm or secondary containment. Are there any:	Y/N			Y/N		Y/N
Cracks or openings						
Presence of spilled or leaked material (standing liquid)						
High level of precipitation in dike/unavailable capacity						
Frozen drainage valves						
Leaking valves, flanges, and gaskets						
Open and unlocked containment area drains						
Discoloration						
Debris						
Erosion						
Area lighting not operating						
Corrosion (if applicable)						

For any item marked YES, please provide description below and report discrepancies to Shift Supervisor immediately:

COMMENTS:

Description of Corrective Actions:

Figure 3.1-3 (continued)
Monthly Inspection Checklist

Facility: Kahe Date of Inspection: ______________ Performed By: ____________________

Tank No.	Emerg. Power 1 & 2	1 & 2 Lube Used	1 & 2 Lube Clean	Fire Pump Diesel
Check Tank. Are there any:	Y/N	Y/N	Y/N	Y/N
Drip Marks				
Discoloration of tanks				
Puddles containing spilled or leaked material				
Corrosion (rusting, pitting)				
Cracks				
Localized dead vegetation				
Damaged bolts, rivets, or seams				
Defective level gauges and alarms				
Obstructed vents				
Check Foundation. Are there any:	Y/N	Y/N	Y/N	Y/N
Cracks				NA
Discoloration				
Puddles containing spilled or leaked material				
Settling				
Gaps between tank and foundation				
Damage caused by vegetation roots.				
Check Piping. Are there any:	Y/N	Y/N	Y/N	Y/N
Droplets of stored material				
Discoloration				
Corrosion (rusting, pitting)				
Bowing of pipe between supports				
Leaking valves, flanges, and gaskets				
Localized dead vegetation				NA
Check Level Sensing Device.	Y/N	Y/N	Y/N	Y/N
Is the level sensing device malfunctioning?				
Check the dike, berm or secondary containment. Are there any:	Y/N	Y/N		Y/N
Cracks				NA
Presence of spilled or leaked material (standing liquid)				
High level of precipitation in dike/unavailable capacity				NA
Frozen drainage valves				
Leaking valves, flanges, and gaskets				
Open and unlocked containment area drains				
Discoloration				
Debris				NA
Erosion				NA
Area lighting not operating				
Corrosion (if applicable)				

For any item marked YES, please provide description below and report discrepancies to Shift Supervisor immediately:

COMMENTS:

Description of Corrective Actions:

Figure 3.1-3 (continued)
Monthly Inspection Checklist

Facility: Kahe Date of Inspection: ______________ Performed By: ____________________

Tank No.	3 & 4 Lube A	3 & 4 Lube B	3 & 4 Ignitor
Check Tank. Are there any:	Y/N	Y/N	Y/N
Drip Marks			
Discoloration of tanks			
Puddles containing spilled or leaked material			
Corrosion (rusting, pitting)			
Cracks			
Localized dead vegetation			
Damaged bolts, rivets, or seams			
Defective level gauges and alarms			
Obstructed vents			
Check Foundation. Are there any:	Y/N	Y/N	Y/N
Cracks			
Discoloration			
Puddles containing spilled or leaked material			
Settling			
Gaps between tank and foundation			
Damage caused by vegetation roots.			
Check Piping. Are there any:	Y/N	Y/N	Y/N
Droplets of stored material			
Discoloration			
Corrosion (rusting, pitting)			
Bowing of pipe between supports			
Leaking valves, flanges, and gaskets			
Localized dead vegetation			
Check Level Sensing Device.	Y/N	Y/N	Y/N
Is the level sensing device malfunctioning?			
Check the dike, berm or secondary containment. Are there any:	Y/N		
Cracks			
Presence of spilled or leaked material (standing liquid)			
High level of precipitation in dike/unavailable capacity			
Frozen drainage valves			
Leaking valves, flanges, and gaskets			
Open and unlocked containment area drains			
Discoloration			
Debris			
Erosion			
Area lighting not operating			
Corrosion (if applicable)			

For any item marked YES, please provide description below and report discrepancies to Shift Supervisor immediately:

COMMENTS:

Description of Corrective Actions:

Figure 3.1-3 (continued)
Monthly Inspection Checklist

Facility: Kahe Date of Inspection: ______________ Performed By: ______________

Tank No.	5 & 6 Lube A	5 & 6 Lube B	5 & 6 Ignitor	New 5 & 6 Ignitor
Check Tank. Are there any:	Y/N	Y/N	Y/N	Y/N
Drip Marks				
Discoloration of tanks				
Puddles containing spilled or leaked material				
Corrosion (rusting, pitting)				
Cracks				
Localized dead vegetation				
Damaged bolts, rivets, or seams				
Defective level gauges and alarms				
Obstructed vents				
Check Foundation. Are there any:	Y/N	Y/N	Y/N	Y/N
Cracks				
Discoloration				
Puddles containing spilled or leaked material				
Settling				
Gaps between tank and foundation				
Damage caused by vegetation roots.				
Check Piping. Are there any:	Y/N	Y/N	Y/N	Y/N
Droplets of stored material				
Discoloration				
Corrosion (rusting, pitting)				
Bowing of pipe between supports				
Leaking valves, flanges, and gaskets				
Localized dead vegetation				
Check Level Sensing Device.	Y/N	Y/N	Y/N	Y/N
Is the level sensing device malfunctioning?				
Check the dike, berm or secondary containment. Are there any:	Y/N			
Cracks				
Presence of spilled or leaked material (standing liquid)				
High level of precipitation in dike/unavailable capacity				
Frozen drainage valves				
Leaking valves, flanges, and gaskets				
Open and unlocked containment area drains				
Discoloration				
Debris				
Erosion				
Area lighting not operating				
Corrosion (if applicable)				

For any item marked YES, please provide description below and report discrepancies to Shift Supervisor immediately:

COMMENTS:

Description of Corrective Actions:

Figure 3.1-3 (continued)
Monthly Inspection Checklist

Facility: Kahe Date of Inspection: ______________ Performed By: ________________

Tank No.	Demin Acid	Demin Caustic	WWTS Caustic
Check Tank. Are there any:	Y/N	Y/N	Y/N
Drip Marks			
Discoloration of tanks			
Puddles containing spilled or leaked material			
Corrosion (rusting, pitting)			
Cracks			
Localized dead vegetation			
Damaged bolts, rivets, or seams			
Defective level gauges and alarms			
Obstructed vents			
Check Foundation. Are there any:	Y/N	Y/N	Y/N
Cracks			
Discoloration			
Puddles containing spilled or leaked material			
Settling			
Gaps between tank and foundation			
Damage caused by vegetation roots.			
Check Piping. Are there any:	Y/N	Y/N	Y/N
Droplets of stored material			
Discoloration			
Corrosion (rusting, pitting)			
Bowing of pipe between supports			
Leaking valves, flanges, and gaskets			
Localized dead vegetation			
Check Level Sensing Device.	Y/N	Y/N	Y/N
Is the level sensing device malfunctioning?			
Check the dike, berm or secondary containment. Are there any:	Y/N	Y/N	Y/N
Cracks			
Presence of spilled or leaked material (standing liquid)			
High level of precipitation in dike/unavailable capacity			
Frozen drainage valves			
Leaking valves, flanges, and gaskets			
Open and unlocked containment area drains			
Discoloration			
Debris			
Erosion			
Area lighting not operating			
Corrosion (if applicable)			

For any item marked YES, please provide description below and report discrepancies to Shift Supervisor immediately:

COMMENTS:

Description of Corrective Actions:

Page 5 of 6

Figure 3.1-3 (concluded)
Monthly Inspection Checklist

Facility: Kahe Date of Inspection: ______________ Performed By: ____________________

Undiked areas		**YES**	**NO**
a. Boiler Wash Sumps:	Free of Oil	☐	☐
b. Roof and Demineralizer Drains:	Free of Oil	☐	☐
c. Pipe Trenches:	Free of Oil	☐	☐
d. Wastewater Ponds:	Free of Oil	☐	☐
e. Wastewater Discharge Piping:	Inspected	☐	☐
f. Main and Aux Transformers:	No Leaks	☐	☐
g. Wastewater Treatment System:	Operating	☐	☐
h. LSFO Supply Pipeline (from Highway to Tanks)	No Observed Oil	☐	☐
i. LSFO Supply Lines (from Tanks to Units)	No Observed Oil	☐	☐
j. Primary Fuel Pump Stations	No Observed Oil	☐	☐
k. Blackstart Unit Piping	No Observed Oil	☐	☐
l. Drum Storage Area	No Leaks or Spills	☐	☐
m. Transformer (tanker) Oil Pumping Station	No Leaks or Spills	☐	☐
p. 1-4 Switchyard (as observed from fenceline)	No Leaks or Spills	☐	☐
o. 5-6 Switchyard (as observed from fenceline)	No Leaks or Spills	☐	☐

Discrepancies (if any)

For any item marked NO, please provide description above and report discrepancies to Shift Supervisor immediately.

COMMENTS:

Description of Corrective Actions:

Page 6 of 6

Figure 3.1-4
Monthly Facility Response Equipment Checklist

Storage Location: Kahe Date: ______________ Inspector: __________________________

Item	Location	Quantity	Status/ Condition
Rubber Storm Drain Blockers	South end (Ewa) of locker room, under bulletin board	1	
Rubber Storm Drain Blockers	On fence next to the stormdrain, northwest (Waianae/makai) part of plant	1	
Rubber Storm Drain Blockers	On the Westside (makai) of the stormdrain trench in the middle of the plant, one for each stormdrain	5	
Rubber Storm Drain Blockers	K1-4 stilling basin wall (mauka)	1	
Rubber Storm Drain Blockers	K5&6 stilling basin east (mauka)	1	
Rubber Storm Drain Blockers	Between K5 & K6 fuel oil pump stations	1	
Rubber Storm Drain Blockers	K6 primary fuel oil pump station	2	
Spill Kit	Next to Hazardous Waste Storage Area by the northeast (Waianae/mauka) part of warehouse	1	
Absorbent Material	Absorbent materials in the warehouse		
Spill Kit	By the reclaimer	1	
Spill Kit	By each EO booth	3	
Spill Kit	In the Drum Storage Area	1	
Spill Kit	K5 primary fuel oil pump station	1	
Spill Kit	K6 primary fuel oil pump station	1	
Spill Kit	Next to the transformer oil transfer pump (Tank 11/12 berm)	1	
Spill Kit	Next to washwater pumps at K6	1	
Spill Kit	Near K3/4 ClO2 System	1	

Note: Report any discrepancies immediately to the Shift Supervisor.

Comments ____

Describe Correction Actions: ____

3.2 HAZARD EVALUATION

This hazard evaluation was performed in accordance with the guidance provided by the Handbook of Chemical Hazard Analysis Procedures (FEMA), and the guidance documents published by the American Institute of Chemical Engineers, Center For Chemical Process Safety (AIChE CCPS). While the guidance documents tend to emphasize process hazards such as explosions and toxic gas releases, this hazard evaluation focused on the potential to release oil from primary containment systems to secondary containment systems and to the environment, including navigable waters. The hazard evaluation was used to develop scenarios for potential oil releases, for use in oil spill response planning.

3.2.1 Hazard Identification

Items 1-3, Tank Information

Table 3.1-2 (Section 3.1) lists all tanks that contain oil or hazardous materials at the Kahe Generating Station. With the exception of one underground gasoline storage tank, all tanks at the facility are aboveground tanks. The maximum capacity for each tank is listed in gallons, and an average quantity stored is also listed in gallons. Tank identification, substance stored, and year installed is provided for each tank. No tanks at the facility have been refabricated, and there have been no tank failures at the facility.

Surface impoundments include Ponds 1A, 1B, 2A, 2B, and the sludge drying beds. There are no surface impoundments at the facility used to store oil or hazardous materials.

Item 4, Facility Schematic Drawing

A facility diagram indicating the location of each tank is provided as Figure 3.1-2.

Item 5, Written Descriptions of Various Aspects of the Facility and Facility Operations

The Kahe Generating Station has six primary generator units, a fuel oil tank farm, and ancillary facilities. The generating units are designed in pairs, with some utility, oil storage, and other ancillary equipment shared. The Kahe Generating Station is a steam plant, with electricity generated by steam driven turbine-generator sets. Two diesel engine driven generators are used as the blackstart units, providing startup power to the steam units. The oil storage tank farm includes four low sulfur fuel oil (LSFO) storage tanks used to receive oil from a pipeline, store oil, and provide oil to the operating generator units.

Item 5A, Transportation Vehicle Loading/Unloading Operations

All LSFO is received and transferred by pipeline. LSFO receipts are via a pipeline from the Chevron Refinery at Barber's Point. The pipeline is owned by HECO and operated and maintained by Chevron. The pipeline tie-in to the Kahe facility is immediately adjacent to a pig receiving and flow metering station. Oil transfers are lined up within the Kahe facility by plant operators, and the transfers initiated after telephone confirmation with Chevron. During the course of pipeline receipts, the level in the receiving tank is checked at least every two hours.

Oil storage tanks are well maintained and are inspected using appropriate provisions of API 653 following a schedule with a frequency of 15 years for both external and internal inspections. Daily visual inspections are conducted by operators during their normal duties. Major tank maintenance activities are typically completed in conjunction with inspections when the tank is taken out of service. Maintenance items identified during monthly inspections (if any) are scheduled and completed as conditions warrant. There have been no significant leaks or releases from oil storage tanks.

Diesel oil is received from tank trucks, for use as emergency generator fuel, blackstart generator fuel, or ignitor fuel. The truck provides, and is responsible for, the hoses used for diesel transfers. There are six separate diesel tanks within the facility; each receives diesel directly from trucks. Each hose connection point is either within a tank containment area, or a drip pan is used to contain any leaks or drips that may occur during transfers. Any storm drains in the vicinity of, or downslope from the transfer point and truck parking area are protected with Safe-Drain® valves or rubber storm drain blocking mats.

Turbine lubricating (lube) oil is received from tanker trucks for use in the generating units. The truck provides, and is responsible for, the hoses used for diesel transfers. There are three separate lube oil tanks within the facility; each receives lube oil directly from trucks. Each hose connection point is either within a tank containment area, or a drip pan is used to contain any leaks or drips that may occur during transfers. Any storm drains in the vicinity of, or downslope from the transfer point and truck parking area are protected with Safe-Drain® valves or rubber storm drain blocking mats.

Motor lube oils are received in 55 gallon drums, approximately one truckload per year. The lube oil arrives with product packaged four drums to a pallet. A forklift is used to unload the pallets from the truck and placed on a spill containment pallet.

Used oil from various sources is accumulated throughout the facility in 55 gallon drums. Each used oil drum is periodically transferred, via forklift with a drum grappler device, to the used oil recovery area adjacent to the blackstart diesel tank. Used oil is generally fuel oil, which has a high pour point, so it is first heated in an electric heater, then pumped into the fuel oil feed line, where it is blended back into the fuel. The used oil transfer area is provided with concrete curbing.

Used transformer oil from HECO’s Ward Avenue facility is transferred to Tank 11 from a 4,000 gallon tanker truck and blended with fuel oil. This activity is conducted using portable pumps within a contained area makai of the blackstart diesel tank.

Item 5B, Day to Day Operations and Maintenance

Routine operations and maintenance activities include the transfer of oil or oil products from tanks or drums to operating equipment or other containers for use. The wastewater and stormwater systems are routinely operated or maintained to prevent, detect, contain, and remove oil prior to discharge. In addition to routine activities there are possible equipment failures that may release oil from primary containment.

The fuel oil distribution system is always in operation during normal facility operations. Transfers from the storage tanks into the generating units are all hard piped. The primary mode of operation of the steam units is to transfer fuel from Tank 11 into the boilers. In addition to the primary fuel oil distribution piping there are backup systems to allow fuel oil transfers from Tanks 12, 13 or 14.

The fuel oil distribution system includes relatively large diameter piping from the twelve inch fuel supply pipeline to the fuel storage tanks and from the storage tanks to the boiler fuel oil distribution header, which is twelve inches in diameter. These pipe systems transfer relatively high flow rates, at low pressures (less than 100 psi). The fuel oil feed systems at each boiler includes primary pumps and booster pumps, and a network of small diameter, high pressure (up to 1000 psi) pipes. The high pressure fuel oil injection piping is heavily instrumented for flow and pressure, and the boiler is instrumented to monitor temperature.

Normal operation of the fuel oil system requires maintenance of the fuel oil strainers. The strainer cleaning is performed over a roll-about bucket to catch any drips. The strainer cleaning includes the physical removal of accumulated debris, and may include the use of kerosene, dispensed from small volume handheld containers, to remove sludge accumulations.

Daily operations and maintenance includes the inspection of accumulation buckets and drip pans for oil, and the inspection of floors, sumps, surfaces, and containment areas for oil discharges. Accumulated oil in buckets or drip pans is collected for recycle into the fuel oil system. Spills or leaks onto floors, containment, or other surfaces may be cleaned using absorbent materials or by other methods depending on the oil volume, oil consistency, and site access. Oil found in wastewater sumps will be traced to identify and eliminate the source, and will be removed from the sump using absorbent materials, a skim pump, or a vacuum truck, depending on the oil volume and consistency.

Lubricating oil is routinely used in rotating equipment throughout the facility. The combustion turbines, steam turbines, boiler feedwater pumps, and fuel oil transfer pumps all have built in reservoirs for lube oil. This oil is not frequently changed. Lubricating oil in the turbines is maintained by filtration and water absorption units that remove accumulated moisture and particulates from the oil, extending the useful life of the oil. Lubricating oil is distributed to bearing and seals under high pressure. Lube oil distribution systems are critical to the operation of large rotating equipment, and are instrumented for pressure, and flow.

Diesel oil is routinely used as fuel for the blackstart generating unit and is distributed directly to the diesel engine in small diameter, high pressure piping. The diesel fuel feed system is heavily instrumented for flow and pressure. Strainers in the fuel supply system are routinely maintained to remove debris. Strainer cleaning is performed over a 5 gallon bucket or similar container.

Diesel oil is used as ignitor and startup fuel for the boilers for the steam driven generating units. Use of diesel in this manner is a normal, but infrequent operation. The diesel oil is supplied to the boilers through a permanent, hard piped system. The piping is small diameter, and may operate at high pressure.

Diesel is also stored and available for use in emergency generators to power equipment including the firewater pump that supplements firewater supply by pumping from the cooling water intake structure.

There are numerous transformers and other oil filled electrical equipment on site, each containing transformer or mineral oil. A release from station transformers, substation transformers or oil filled circuit breakers would likely be a small volume and limited in extent. A large release volume however, may reach the facility drainage system and require intervention. Used transformer oil from HECO's Ward Avenue facility is transferred to Tank 11 from a 4,000 gallon tanker truck and blended with fuel oil. This activity is conducted using portable pumps within a contained area makai of the blackstart diesel tank.

Wastewater is accumulated in sumps, dedicated to each pair of steam generators. Sumps are inspected once per shift for oil accumulation. Any bulk oil accumulation is removed by vacuum truck. The sumps pump, on level control, to the wastewater treatment plant influent tank , where another oil inspection and removal occurs. From this influent tank water is transferred on level control, to the batch tanks for pH adjustment and discharge.

The steam condensate system is also inspected for oil accumulation, indicating perforated steam tubing in storage tank heating coils or fuel oil heat exchangers.

Cooling water from the ocean intake structure is used on a once through, indirect basis. It is used to cool a circulating process water stream which in turn is used in lube oil coolers. The circulating process water is inspected for oil accumulation that could occur in the event of a tube failure in a cooler. Oil-filled bearings in circulating water pumps and transformers located in the stilling basin area present a potential for a direct discharge in the event of a release. Frequent inspection of this equipment allows for early detection and mitigation.

Stormwater system drains and surface runoff collection, diversion, and control systems are designed to channel stormwater away from the facility. Those systems are segregated from oil and chemical handling areas by permanent curbs or by temporary curbs, plugs or other barriers used during transfer operations.

5C, Secondary Containment Volumes

The secondary containment volumes for the various containment basins within the facility are listed on Table 3.1-2. Containment volumes for each tank and for the total facility are also listed.

Item 5D, Normal Daily Throughput

The normal daily throughput of fuel oil is 18,000 barrels, or 756,000 gallons.

3.2.2 Vulnerability Analysis

This section identifies the vulnerability of public and private facilities in the area which could be impacted from a potential spill from the Kahe Generating Station.

Spills from Units 5 and 6 fuel islands could enter the storm drain system. While this system contains at least one accessible trap, it ultimately discharges directly to the ocean via the cooling water outfall.

Uncontrolled spills from Units 1 to 6 could enter the trench and sump system and ultimately would be pumped to the waste treatment facility.

Spills from the storage tanks would normally be contained within existing secondary containment. In the event of a secondary containment failure, spills could flow toward the ocean. Spills from the blackstart diesel, switchyard and shop areas would drain to an interceptor trench which drains northward to an earthen discharge swale. The swale passes under the Farrington Highway and discharges to the ocean.

Spills from Station transformers could enter the oily wastewater sump and would ultimately be cleaned out be facility or contract personnel. Spills from the Switchyard transformers could enter the stormdrains system and discharge to the northern swale and ultimately to the ocean.

Releases from the cooling water circulating pumps and transformers could enter the drains in the area and would be discharged into the cooling water and ultimately into the ocean.

Prediction of the movements of spilled fuel oil at the Kahe Generating Station are complicated by the fact that the pour point of the material (90º F or greater) is commonly above ambient temperature (must be heated to pump). When spills of this material cool to below the pour point, as would occur in most cases, the spilled material will be come increasingly viscous to the point where it will behave as a solid (in this condition, it will not flow or spread on water). Unless carried by flowing water, it is questionable whether spills of this material could travel as far as the ocean. However, in the event that spilled material was to reach the ocean, such material would be expected to behave as a solid and if floating, move in response to winds and longshore currents. In response to the North Equatorial Oceanic Current, the predominant flow direction along this section of the coast will be to the northwest. During flood tides, the current direction will typically reverse (flow toward Barbers Point). In general, Trade winds will tend to deflect coastal currents offshore while Kona winds tend to deflect them onshore. Under the Kona condition, spilled material reaching the ocean would probably be held along the shore in the immediate vicinity of the generating station.

Some of the spilled material will be lost to evaporation. While prediction of evaporative loss is complicated by the high pour point of the material, an indication of the potential evaporative loss can be obtained using the NOAA predictive model (ADIOS) for Bunker C fuel oil produced at Barbers Point (one of the fuels used at Kahe). (b) (7)(F), (b) (3) [redacted]

Over time, spills of this material will increase in specific gravity due to processes such as evaporation and incorporation of sediment. When the specific gravity of the material exceeds that of water, sinking will occur. Spills of submerged material will probably be transported along the bottom, ultimately moving to deeper water. This movement would probably follow the normal sediment transport pattern and offshore through the sand channel which extends seaward directly off the Kahe Generating Station discharge structure.

The potential for entrainment of spilled material which has been discharged either through the cooling water intake or via overland flow in the cooling water intake is considered possible.

Because of the complexity of circulation patterns off Kahe, oil spilled to the ocean could move in a variety of directions. Due to uncertainties regarding the actual behavior of the spilled oil, the vulnerability analysis will consider a zone of potential impact along the area from Barbers Point to Kaena Point.

Resources which could exhibit varying degrees of vulnerability to oil exposure in the event of a release from the facility are identified. Those resources identified in the Local Area Contingency Plan are marked with an asterisk.

Water Intakes*

(b) (7)(F), (b) (3) [redacted]

Schools

(b) (7)(F), (b) (3) [redacted]

Medical Facilities

No facilities have been identified which would be directly impacted by a spill from the facility.

Residential Areas

Residential communities are located approximately 1.5 miles to the north (Nanakuli) and approximately 1.5 miles to the south of the facility. The degree of direct impact of a spill on local residents is uncertain, but anticipated to be minimal.

Businesses

A variety of businesses are located along the highway from Nanakuli north to Makaha.

The Ko Olina Resort area and Barbers Point Deep Water Barge Harbor are located to the south of the generating station. These businesses could be subject to varying degrees of impact in the event of an oil spill. While service businesses could benefit from increased business from response crews, most businesses, particularly the resorts, would be expected to suffer interference with their normal operations commensurate with degree of exposure.

Wetlands or Other Sensitive Areas*

Coral reefs have been identified off Kahe Point. Coral reef also exists from Kahe Point south toward Barbers Point and north at Maili Point and Lahilahi Point. Sea grasses are reported between Maili Point and Ulehawa Beach Park. In general, the LSFO potentially spilled contains relatively low concentrations of soluble components and probably represents minimal threat to submerged coral reefs of seagrass beds. In the sunken form, however, it could exhibit smothering and other effects on and exposed coral or seagrass.

Fish and Wildlife*

Hawaiian coastal waters support a wide variety of birds, fish and other marine organisms. Local species of particular interest are listed in the HACP.

Lakes and Streams

A seasonal drainage is located on the north side of the plant. Localized impacts to flora and fauna living in this drainage would be expected from direct oil impacts and impacts associated with cleanup. This drainage is normally dry, and periodically disturbed to keep its channel open. Impacts should be minimal.

Endangered Flora and Fauna*

Turtles are reported to utilize the nearshore waters from Kahe to Barbers Point. Exposure to floating oil could be detrimental to turtles. Other endangered species are listed in the HACP.

Recreational Areas

*Wave riding zones**

- Makaha Beach
- Maili Beach
- Kahe Beach

*Recreational Boating**

- Waianae Boat Harbor
- Barbers Point Deep Draft Harbor

*High Use Beaches and Parks**

- Makaha Beach
- Pokai Bay Beach
- Nanakuli Beach
- Malai Beach

*Organized Recreation Areas**

- Pokai Bay Beach
- Nanakuli Beach

*Commercial Ocean Recreation**

- Waianae Coast recreational fishing and diving

*Tourism**

- Ko Olina Resort area

Oiling of any of the above listed areas is expected to cause significant short-term disruption in their use.

Transportation Routes

Highway 93, the Farrington Highway, is located between the facility and the ocean. The Farrington Highway is the major access to the leeward shore. While it is unlikely that a spill event would result in the closure of the highway, even temporarily, spill-related traffic could increase congestion in the area.

Utilities

The Kahe Generating Station is the only local utility identified. Loss of generating capacity as a result of a spill event would be expected to result in potentially significant impacts on Oahu.

3.2.3 Analysis of the Potential for a Spill

In July 2002, a "what-if" type qualitative hazard analysis was performed to identify potential sources for oil spills. Subsequently a quantitative hazard evaluation was performed according to the Handbook of Chemical Hazard Analysis Procedures prepared by EPA, DOT, and FEMA.

The "what-if" analysis included HECO personnel who are familiar with facility equipment, operations, and maintenance as well as ENTRIX personnel who are familiar with oil spill prevention, process hazard identification, and engineering design. The goal of the "what-if" analysis was to identify scenarios with an oil spill as a potential outcome. Qualitative output from the "what-if" analysis and quantitative hazard evaluation results have been combined to identify likely small, medium, and worst case spills described in Section 3.8. In April 2012, HECO personnel met and confirmed that there were not significant changes to the analysis.

"What-If" Qualitative Hazard Evaluation

The "what-if" evaluation considered potential internal initiating events including process upsets, management system failures, and human error, as well as external events such as tsunami, earthquake, social unrest, and local accidents. Process Piping and Instrumentation Diagrams (P&IDs) were reviewed during the evaluation of internal initiating events. To assist in the hazard evaluation, the facility operations were divided into the following areas: oil receiving; oil storage; oil transfers; oil use; used oil recovery, stormwater, and wastewater systems.

The qualitative hazard evaluation concluded that the area with the highest likelihood of leaks and spills is the small diameter, high pressure piping and associated connections used to deliver fuel oil into the burners or combustion turbines. However, the consequence of these types of spills is limited by the small volume of oil expected to be discharged, and the local containment provided around the operating units. The various vehicle transfer operations were cited as operations with a potential to release oil, with potentially tank truck quantities of oil spilled. The consequences of transfer operation spills are limited by protecting storm drains and other pathways to water during transfers. The potential for worst case spills from storage tank or large diameter pipeline failures was identified. The likelihood of such an event was considered very low. Such a failure could be associated with tsunami or direct seismic activity.

Participants in the April 2012 "what-if" hazard evaluation included the following individuals:

- Teddy Canterbury is a Hawaiian Electric Company employee. As the Operation Superintendent, he is familiar with the Kahe facility, design, layout, and operations.
- Anthony Ramelb is a Hawaiian Electric Company employee. As the facility Senior Supervisor, he is also familiar with the Kahe facility, design, layout, and operations.
- Kirk Tomita is a Hawaiian Electric Company employee with responsibility over environmental programs.

Quantitative Hazard Evaluation

Event frequency data and methodologies from the Handbook of Chemical Hazard Analysis Procedures by FEMA, DOT, and EPA were used to determine the following failure frequencies. These frequencies, summarized below, are based on national databases and are not modified to reflect regional or facility specific experience. The worksheet showing calculations is provided on Table 3.2-1 and Table 3.2-2. The methodology presented in Table 3.2-2 is intended to be applied to highway transportation, not to transport within the facility. These quantitative hazard evaluation results should only be used to provide a relative ranking of risks posed by various spill scenarios.

These frequencies are calculated based on input data that includes 17 bulk oil storage tanks, an estimated 10,000 feet of pipe, an estimated 52 annual loading/unloading events, an estimated 10 transfer hoses used in the facility, and an estimated 260 forklift transfers of containers.

Spill Description	Frequency Spills/Year
Unloading hoses, release through full hose diameter for time required to shutdown.	10 * 10-2
Piping failure, flow through one inch hole, or pipe diameter for time required to shutdown.	135 * 10-4
Tank overfill or one inch hole, loss of 10% of tank contents, frequency accounts for all 28 oil tanks.	15.3 * 10-4
Piping failure, flow through pipe diameter for time required to shutdown.	15 * 10-4
Catastrophic tank failure, loss of 100% of tank contents, frequency accounts for all 28 oil tanks.	1.7 * 10-4
Spill from oil drum, vehicle accident or forklift puncture, loss of 55 gallons.	26 * 10-6*

*In reality, the risk may be higher as the calculations were based on highway transportation, not forklift transportation.

Spill History

The facility has never experienced an oil discharge to navigable waters.

Table 3.2-1
Estimating Fixed Facility Release Frequencies

Hazardous Material(s):	Oil
Number of Process Vessels/Single-Wall Storage Tanks:	A = 16
Number of Double-Walled Storage Tanks:	B = 0
Length of Pipe (feet):	C = 10,000
Annual Number of Loadings/ Unloadings:	D1 = 52
(or number of hoses)	D2 = 10
Spill Frequencies* **Process Vessels/Storage Tanks:** **Double-Walled Storage Tanks:** **Piping:** **Loading/Unloading Hoses:**	 E = A x 10-4 = 16 * 10-4 (spills/year) F = B x 10-6 = N/A (spills/year) G = C x 1.5 x 10-6 = 150 * 10-4 (spills/year) H = D1 x 10-4 = 52 * 10-4 (spills/year)
	OR H = D2 x 10-2 = 10 * 10-2 (spills year)
Spills by Size* **Process Vessels/Storage Tanks** **10% of contents (1" hole):** **100% of contents:**	 E x 0.9 = 15.3 * 10-4 (spills/year) (E x 0.1) + F = 1.7 * 10-4 (spills/year)
Piping	
release through 1" hole:	G x 0.9 = 135 * 10-4 (spills/year) (flex joints .003)
release through full pipe diameter for time needed for shutdown or until associated tank is emptied:	G x 0.1 = 15 * 10-4 (spills/year) (flex joints .003)
Loading/Unloading Hoses	
release through full hose diameter at transfer rate for time needed for shutdown:	H = 10 * 10-2 (spills/year)

NOTES:

*Assumes that the consequences of releases will be based on the tanks, piping and loading hoses which give the worst consequences.

Table 3.2-2
Estimating Bulk Truck Transportation Release Frequencies

Hazardous Material(s):	drummed lubricating oils, waste oil or kerosene
Total Number of Annual Shipments:	A = 260
Length of Route of Concern:	B = .25 (miles within jurisdiction)
Total Number of Miles Per Year:	C = A * B = 65
Accident Frequency:	D = C * 2 * 10-6 = 130 * 10-6 (accidents/year)
Spill Frequency:	E = D * 0.2 = 26 * 10-6 (spills/year)

3.3 INCIDENT COMMAND SYSTEM

Initial response to any oil spill from the Kahe Generating Station or Pipeline will be under the direct supervision of the Shift Supervisor or his designee. The Shift Supervisor is designated as the initial HECO Incident Commander and Safety Officer, and can use the checklist in Section 1.1 to activate the HECO Spill Management Team (SMT). The initial response organization is illustrated in Section 1.5.

3.3.1 Qualified Individuals, Incident Commanders and Emergency Response Coordinator

The Qualified Individual (QI) or Alternate will be responsible for coordinating HECO's actions with the actions of the Federal On-Scene Coordinator. HECO is the owner and/or operator of the facilities covered by this FSRP and the QI and Alternate are employees of HECO.

Responsibilities of the QI include:

- Activation of internal alarms and hazard communications systems to notify all facility personnel.
- 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 provide the necessary information to the appropriate federal, state and local authorities with designated response roles.
- Assessment of the interaction of the spilled release 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.
- Authorization to immediately access company funding to initiate cleanup activities and direct cleanup activities until properly relieved of this responsibility.

Figure 3.3-1 provides a list of persons named to be QIs for HECO. These individuals have been provided with written authority to utilize HECO resources, as necessary, for oil spill response.

Individuals named as QIs also have the authority to act as Incident Commanders and Emergency Response Coordinators.

3.3.2 Incident Command System

HECO will assume responsibility for the physical control, containment, and clean-up for the discharge of any petroleum products from the Kahe Generating Station or Kahe Pipeline. The HECO response will be managed under an Incident Command System (ICS) compatible with the National Interagency Incident Management System as described in Sections 2000 through 6000 of the Hawaiian Area Contingency Plan (HACP). HECO will utilize Clean Islands Council (CIC) as the primary spill response contractor. Key response contractor managers may be incorporated directly into the SMT as needed.

The HECO Spill Management Team is also available to supplement the station personnel. HECO maintains a sufficient number of qualified personnel to provide continuous coverage to a prolonged oil spill response effort. The Team includes over 50 HECO employees from Oahu, as well as numerous contract personnel. Team members receive cross training in all aspects of ICS, and routinely participate in exercises.

HECO's primary ICS organization chart is provided in Figure 3.3-2. Most of the team members are based either at the Ward Avenue Complex, Downtown Honolulu or other HECO Generating Stations. Procedures are described in Sections 1.2 and 1.5 of this plan.

The HECO 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 facility personnel, though spills could also be reported by federal or state agencies, citizens groups, or from private citizens. The Incident Commander will direct any member, or the entire HECO SMT, 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 HECO and contract ICS personnel to initiate the response to the oil spill.

Figure 3.3-1
HECO Qualified Individuals

Subject: Designation of "Qualified Individuals and Alternates" pursuant to the definitions(s) and requirements described in The Federal Register, Vol. 58, No. 23, February 5, 1993, p. 7427 and The Federal Register, Vol. 59, No. 126, July 1994, p. 34100.

To Whom It May Concern:

The following individuals are designated as "Qualified Individuals and Alternates" for the Kahe Generating Station and Kahe Pipeline. Each of the individuals named are qualified under the regulations to initiate those actions called out in the above referenced regulations.

Primary Qualified Individual

- Anthony Ramelb – Kahe Senior Supervisor

Alternate Qualified Individuals

- Teddy Canterbury – Kahe Operations Superintendent
- Anthony Taparra – Waiau Operations Superintendent
- Steven Change – Waiau Senior Supervisor
- Mark Yamashiro – Honolulu Senior Supervisor
- Zigmund Prompivicz – Maintenance Superintendent
- Karen Mark – Planning Superintendent

A listing of telephone numbers for QIs is provided in Section 1.2 (Table 1.2-1).

Emergency Response Personnel

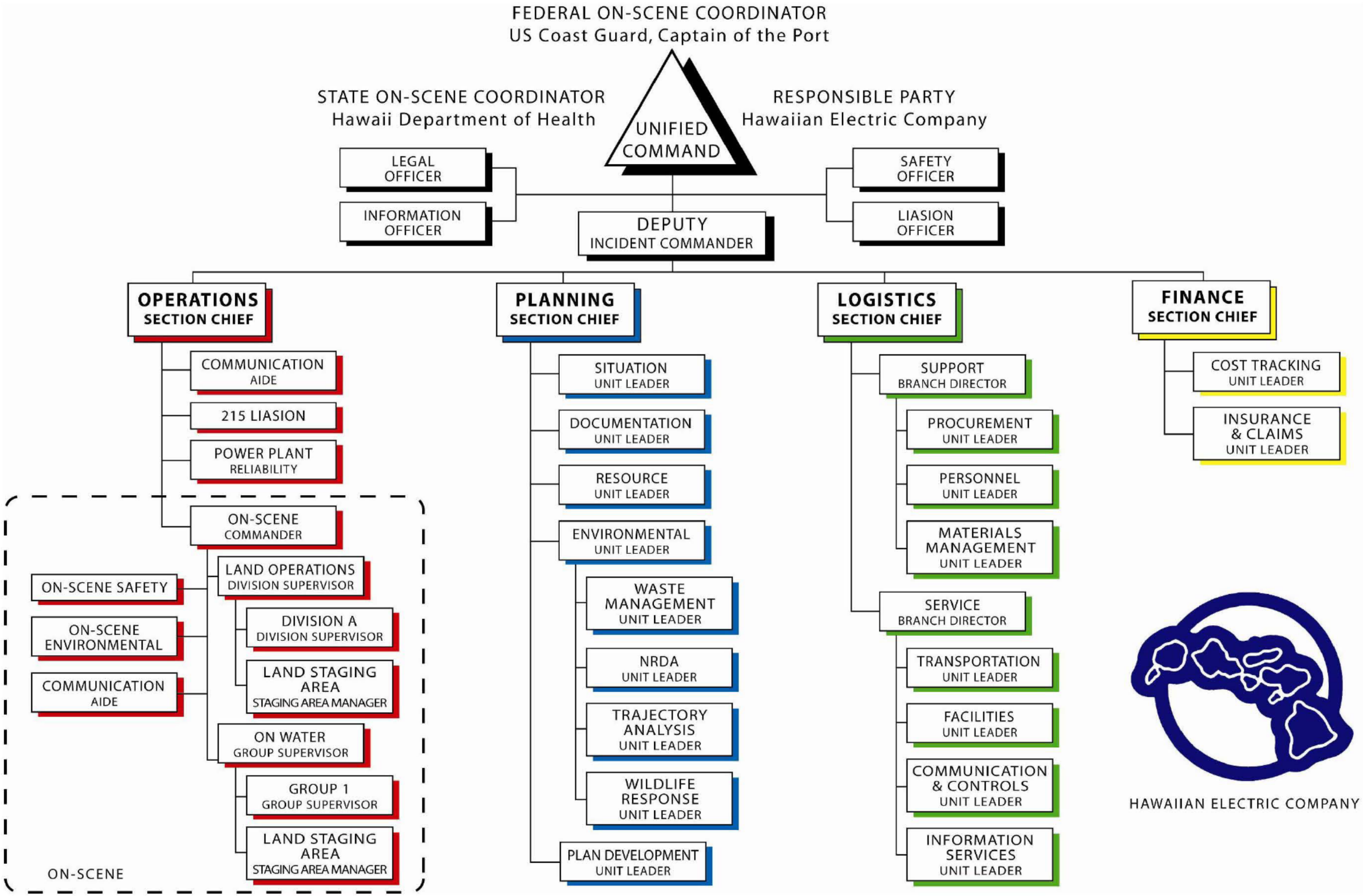
Emergency Response Personnel are listed on Table 3.3-1. Contact information for emergency response personnel is maintained by the Generation Department and notifications are made by phone, email and/or text message.

Command and General Staff members of SMT are listed in Table 1.2-2.

Table 3.3-1
Emergency Response Personnel

Name	Response Time (min.)	Responsibility During Response Action	Response Training
Ron Cox	120	Incident Commander	ICS/Hazwoper
Lawrence Ornellas	120	Operations Section Chief	ICS/Hazwoper
Zigmund Frompovicz	120	Operations Section Chief / QI	ICS/Hazwoper/QI
Lane Hiramoto	120	Deputy Operations Section Chief	ICS/Hazwoper
Marshall Costello	120	Deputy Operations Section Chief	ICS/Hazwoper
Tony Taparra	120	Division Supervisor / QI	ICS/Hazwoper/QI
Teddy Canterbury	120	Division Supervisor / QI	ICS/Hazwoper/QI
Mark Yamashiro	120	Division Supervisor / QI	ICS/Hazwoper/QI
Steven Chang	120	Division Supervisor / QI	ICS/Hazwoper/QI
Anthony Taparra	120	Division Supervisor / QI	ICS/Hazwoper/QI
Cindy Van Meerten	120	Staging Area Manager	ICS/Hazwoper
Kelly Perbera	120	Staging Area Manager	ICS/Hazwoper
Emil Eala	120	Staging Area Manager	ICS/Hazwoper
Karen Mark	120	Planning Section Chief	ICS/Hazwoper
Paul Pedro	120	Planning Section	ICS/Hazwoper
Keith Nakamoto	120	Planning Section	ICS/Hazwoper
Eduardo Martinez	120	IAP Developer (Planning)	ICS/Hazwoper
Robert Kahawaii	120	IAP Developer (Planning)	ICS/Hazwoper
Donn Fukuda	120	Environmental Unit Leader	ICS/Hazwoper
Kirk Tomita	120	Environmental Unit Leader	ICS/Hazwoper
John Lu’uwai	120	Documentation Unit Leader	ICS/Hazwoper
Jamie Madrigal	120	Documentation Unit Leader	ICS/Hazwoper
Michael Ishihara	120	Resources Unit Leader	ICS/Hazwoper
Tony Erolin	120	Resources Unit Leader	ICS/Hazwoper
John Sturges	120	Situation Unit Leader	ICS/Hazwoper
Steven Kehm	120	Situation Unit Leader	ICS/Hazwoper

Figure 3.3-2
HECO Spill Management Team Organization Chart



THIS PAGE INTENTIONALLY LEFT BLANK

The ICS has been adopted so that response actions contractors, federal response groups, state response groups, and citizen response groups can be activated and meshed with the HECO 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.

Incident Command Team Duties and Responsibilities

Incident Commander – Responsible for managing the response including the development and implementation of strategic decisions. The Incident Commander delegates or assigns a Deputy to delegate duties and responsibilities.

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.

Command Staff

Legal Representative – 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.

Liaison Officer – Responsible for communicating with local, state and federal government agencies not involved in the Unified Command Structure. Also advises interested groups, corporations and organizations of the actions the Spill Management Team is taking and address concerns.

Public Information Officer – Responsible for the formulation and release of information regarding the incident to the news media.

Safety Officer – Responsible for monitoring and assessing hazardous and unsafe situations and developing measures for ensuring personnel safety.

Operations Section

Operations Section Chief – Responsible for the management of all operations directly applicable to containment, recovery, cleanup and rehabilitation. Activates and supervises organization elements in accordance with the Emergency Response Action Plan and directs its execution.

Recovery and Protection Branch Director – Responsible for overseeing and implementing the protection, containment and cleanup activities established in the IAP.

Emergency Response Branch Director – Responsible for overseeing and implementing emergency response measures to protect life, mitigate further damage to the environment and stabilize the situation.

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.

Wildlife Branch Director – Responsible for minimizing wildlife losses during spill response, and recovering and rehabilitating impacted wildlife.

Staging Area Manager – Manages all activities within a designated staging area.

Planning Section

Planning Section Chief – Responsible for the collection, evaluation, dissemination, and use of information about the development of the spill and status of resources. The information as needed to understand the current situation, predict the probable course of incident events and prepare alternate strategies and control operations for the incident. Prepares Incident Action Plan (IAP).

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

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

Demobilization Unit Leader – Responsible for developing the Incident Demobilization Plan and assisting in effective demobilization of personnel and equipment.

Environmental Unit Leader – 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 – Responsible for providing facilities, services, and materials in support of the incident.

Service Branch Director – Responsible for management of service activities (e.g., communications, medical, food).

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

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

Mess/Berthing Unit Leader – Responsible for determining the food and berthing requirements and providing food/facilities as necessary.

Support Branch Director – 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.

Supply Unit Leader – 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.

Security Officer – Responsible for providing safeguards needed to protect personnel and property from loss and damage. "Specific Post Orders" are developed to custom-fit the security needs of the incident.

Transportation Unit Leader – Responsible for coordinating transportation resources on land water and air.

Finance Section

Finance Section Chief – Responsible for all financial and cost analysis aspects of the spill incident.

Contracting Unit Leader – Responsible for providing contract information and negotiation of new contracts.

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

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

Government Agencies

The primary government agencies concerned with oil spills in Hawaii are the Hawaii Department of Health (DOH), the U.S. Coast Guard (USCG), and U.S. Environmental Protection Agency (EPA). Additional government agencies with potential involvement are listed in Section 1.2.

DOH is the lead state agency for environmental pollution response within the State of Hawaii and designated as the State On-Scene Coordinator (SOSC). 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. The USCG has primary responsibility for coastal zones within Hawaii.

In the event of a major spill, an FOSC will be designated. The FOSC is usually a USCG 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 NOAA (National Oceanic and Atmospheric Administration) Scientific Support Team, under the direction of the Scientific Support Coordinator, provides information on spill trajectories and critical habitats. The USCG Pacific Strike Team, based in California, has air-deployable equipment and experienced operators to respond to major spills.

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 and activate the Strike Team.

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.

3.4 CONTINGENCY PLAN UPDATES

3.4.1 Plan Availability and Use

This FSRP has been prepared by the HECO Environmental Department in Honolulu, Hawaii. The Environmental Department will retain the master copy of this FSRP and the plan distribution list.

Copies of the FSRP will be distributed to the Environmental Protection Agency (EPA), Pipeline Hazardous Material Safety Administration (PHMSA) and other interested parties. A copy of this FSRP will be kept in the Shift Supervisor's office at the Kahe Generating Station where it will be immediately available for inspection or use. A record of plan distribution will be maintained by the Environmental Department.

The Shift Supervisor will review the FSRP with the Utility Operators once a quarter, use the FSRP during spill response drills, and practice policies which are described in this FSRP to assure that all personnel are familiar with the FSRP.

3.4.2 Routine Plan Updates

This FSRP will be reviewed annually by the Environmental Department to ensure that plan information is current. The annual review will be documented in the “Record of Review and Revisions” log sheet, kept in the front of the FSRP.

Changes, when made, will be recorded on the "Record of Revisions" log sheet (see Introduction section of this FSRP). 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 FSRP 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 FSRP. All plan holders are encouraged to immediately advise the HECO Environmental Department (808-543-4528) of any needed corrections which come to their attention.

3.4.3 Plan Amendments

This FSRP is not intended to be a static document. It will be reviewed and amended as necessary whenever changes in facility operations require plan resubmission for PHMSA and EPA to re-examine or re-approve the FSRP. Types of changes that may require revisions/amendments include:

- Revision of applicable regulations;
- Significant change in the facility's configuration;
- Changes to the facility that could materially increase the potential for spill incidents or changes the response system;
- Change in the facility's operating area that includes ports or geographic areas not covered by a previously approved plan;

- Change to the identity, capability, or availability of the response resources identified and available by contract or other approved means changes;
- Changes needed if the plan fails during an emergency response or drill;
- Change in facility ownership or management changes;
- Change in the types of oil handled, stored or transported at the facility changes;
- Substantial increase to the potential worst case discharge spill volume; or
- Response to EPA or PHMSA deficiency notices (e.g., determination that the plan does not meet the requirements).

If no other revisions occur, this FSRP 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 FSRP, including a substantial decrease in available spill response equipment.

3.4.4 Post Spill Review

Following drills, or an actual spill, the training or response effort and the FSRP will be reviewed and evaluated to ensure a continued preparedness to respond. Using the objectives identified in Section 3.7, HECO 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 maintained at the facility.

3.5 SPILL RESPONSE RESOURCES

The purpose of this section is to provide comprehensive and updated listings of the resources available for spill response operations. Implementation of the HACP Geographic Annex strategies depends upon the availability of many types of services, equipment, and materials from industry cooperatives, private contractors, and local, state, and federal agencies, in addition to in-house resources. HECO is responsible for maintaining access to suitable equipment and sufficient manpower with requisite spill response knowledge and experience.

3.5.1 On-Site Resources

Storm drain blockers and absorbent materials are maintained at the facility. These materials can be used to control small, low pressure leaks, drips, etc.

HECO will supply personal protective equipment (PPE) (i.e., respirator protection, chemical goggles/safety glasses, hard hats, impervious rubber gloves, rubber boots, Tyvek suits) for HECO employees.

3.5.2 Local and Regional Resources

Table 3.5-1 provides a listing of the local and regional resources available in the event of an oil spill from the Kahe Generating Station or Kahe Pipeline. HECO, along with the oil spill cooperative and contractors listed in this section, can supply the majority, if not all, of the equipment, supplies, support services, and manpower necessary for most cleanup operations.

Contractors will be responsible for ensuring that adequate resources, such as safety gear, first aid kits, portable restrooms and decontamination equipment are available for an oil spill.

Additional resources and logistical information is provided in Section 5000 of the HACP.

Table 3.5-1
Local and Regional Resources

Company Name	Location(s)	Telephone/Fax
Booms, Sorbents, Skimmers		
Clean Islands Council	Honolulu	(808) 845-8465
PENCO	Honolulu	(808) 545-5195
Marine Logistics	Honolulu	(808) 522-1008
Bearing Sea Eccotech	Honolulu	(808) 216-3195
National Response Corporation Environmental	Seattle, WA	1-800-337-7455
Marine Spill Response Corporation (MSRC)	Honolulu	(808) 847-8144
Catering		
Zippy's (Food Solutions International)	Honolulu (Waipio Gentry)	955-6622 (677-7766)
HMS Host	Honolulu Airport	836-2566 (x247 / x222)
Compressors, Pumps, Generators, Portable Lighting		
Biven's Electric dba West Coast Construction	Waipahu	(808) 455-5222
Ikaika Masonry & Utilities	Waimanalo	(808) 259-5546
Henkels & McCoy	Kapolei	(808) 486-9460
M. Sakuma Electric	Honolulu	(808) 847-7173
Dump Trucks		
Biven's Electric dba West Coast Construction	Waipahu	(808) 455-5222
Ikaika Masonry & Utilities	Waimanalo	(808) 259-5546
Henkels & McCoy	Kapolei	(808) 486-9460
M. Sakuma Electric	Honolulu	(808) 847-7173
Earth Moving Equipment		
I Doi-Hauling Contractor, Inc.	Honolulu	(808) 839-7714
Noe's Excavating & Grating	Pearl City	(808) 456-3331
Biven's Electric dba West Coast Construction	Waipahu	(808) 455-5222
Ikaika Masonry & Utilities	Waimanalo	(808) 259-5546
Henkels & McCoy	Kapolei	(808) 486-9460
M. Sakuma Electric	Honolulu	(808) 847-7173

Table 3.5-1 (Continued)
Local and Regional Resources

Company name	Location(s)	Telephone/Fax
	Equipment Rentals	
FKS Rental	Honolulu	(808) 836-2961
Pacific Machinery	Honolulu	(808) 677-9111
Bacon Universal	Honolulu	(808) 839-7202
	Fabrication and Construction	
Howard Engineers & Construction	Kapolei	(808) 682-2466
Kiewit Pacific	Kapolei	(808) 674-1088
Precast Inc.	Honolulu	(808) 845-1554
Ameron	Halawa	(808) 832-9460
Jensen Precast	Honolulu	(808) 528-1175
	Fire Fighting	
Honolulu Fire Department	Oahu	911
	Fixed Wing Aircraft	
	Float Planes	
	Helicopters (Standard)	
Pacific Helicopter	Honolulu	1-808-871-9771
	Helicopters (Heavy Lift)	

Table 3.5-1 (Continued)
Local and Regional Resources

Company name	Location(s)	Telephone/Fax
Hoses (Suction/Discharge)		
Hose Service Inc.	Honolulu	(808) 847-1515
Hydra Air Pacific	Honolulu	(808) 961-6774
Housing Capacity		
Ala Moana Hotel	Honolulu	(808) 955-4811
Airport Hotel	Honolulu	(808) 837-1502
Best Western Plaza	Honolulu	(808) 837-1574
Turtle Bay Resort	Laie	(808) 293-6054

Table 3.5-1 (Continued)
Local and Regional Resources

Company name	Location(s)	Telephone/Fax
Industrial Vacuum Loaders (Liquids/Solids)		
Jimmy's Razorback Pumping Service	Honolulu	(808) 306-8922
QPM dba Quality Pumping & Maintenance	Honolulu	(808) 848-1569
Bering Sea Eccotech	Kapolei	(808) 216-3195
Lumber		
Honsador Inc.	Ewa Beach	(808) 682-2011
City Mill	Honolulu	(808) 533-3811
Medical Facilities		
Queen's Medical Center	Honolulu	(808) 538-9011
Straub Hospital	Honolulu	(808) 522-3781
Oil Transfer & Lightening Equipment		
Unitek	Honolulu	(808) 831-3076
Hawaiian Tug & Barge	Honolulu	(808) 543-9325
Pipes, Valves and Fittings		
Valve Service & Supply	Ewa Beach	(808) 682-3800
Hawaii Pipe & Supply	Honolulu	(808) 832-7473
Portable Tanks		
Bering Sea Eccotech	Kapolei	(808) 216-3195
Pacific Commercial Services	Honolulu	(808) 545-4599 x2
Portable Toilets		
CHEMITOI	Ewa Beach	(808) 682-2466
VIP Sanitation	Pearl City	(808) 455-7626
Paradise Lua	Waianae	(808) 690-8116
Pressure Washers		
PENCO	Honolulu	(808) 545-5195
Unitek	Honolulu	(808) 831-3066

Table 3.5-1 (Continued)
Local and Regional Resources

Company Name	Location(s)	Telephone/Fax
Radio/Communication Equipment		
Mobile Communication	Honolulu	(808) 366-5276
Wireless Rentals	Honolulu	(808) 926-8300
Radio and Cellular Rentals	Honolulu	(808) 537-3480
Safety Supplies		
Safety Systems	Honolulu	(808) 847-4017
Gaspro, Inc.	Honolulu	(808) 842-2222
Sun Industries	Honolulu	(808) 833-2502
Security Services		
Akal Security (Present Plant Security)	Aiea	(808) 485-8844
Burns International Security	Honolulu	(808) 842-4800
Tank Trucks		
Unitek	Honolulu	(808) 831-3066
Pacific Commercial Services	Honolulu	(808) 545-4599 x2
Jimmy’s Razorback Pumping Service	Honolulu	(808) 306-8922
Bering Sea Eccotech	Kapolei	(808) 216-3195
Temporary Labor Pools		
RJ’s Electrical	Honolulu	(808) 682-8800,8801
Ikaika Masonry & Utilities	Waimanalo	(808) 259-5546
Transportation		
Yellow Freight International	Waipahu	(808) 671-3983
Kams Express	Honolulu	(808) 839-2735
Henkels & McCoy	Kapolei	(808) 486-9460
Vacuum Trucks		
Unitek	Honolulu	(808) 831-3066
Jimmy’s Razorback Pumping Service	Honolulu	(808) 306-8922
Bering Sea Eccotech	Kapolei	(808) 216-3195
Pacific Commercial Services	Honolulu	(808) 545-4599 x2
Vessels and Barges		
Hawaiian Tug & Barge	Honolulu	(808) 543-9325
Marine Logistics	Honolulu	(808) 522-1008

3.6 RESPONSE CONTRACTOR INFORMATION

HECO’s primary response contractors are Clean Islands Council (CIC) and NRC Environmental. Copies of the CIC and NRC Environmental agreements and equipment lists are provided following this section. Additional contractors, Marine Logistics and Pacific Environmental (PENCO) are available to HECO through agreements with CIC.

The focus of CIC’s response posture is first strike immediate response. As such, much of their equipment is located in the field adjacent to oil transfer activities in accordance with the Hawaiian Area Plan Geographic Response Strategies.

The equipment pre-staged at neighbor island locations meets the fifty-barrel (50 bbl) OPA ’90 Tier 1 planning standard. In order to meet the Tier 2, twelve-hundred-fifty-barrel (1250 bbl) planning standard, equipment will be cascaded from Honolulu. Equipment can also be transferred from other commercial harbors on the same island.

CIC maintains a number of “packages” that are not required for Oil Spill Response Organization (OSRO) classification but are needed to be fully prepared for complete response preparedness. They also maintain a 130-foot oil spill response vessel (OSRV) that is one of the most fully equipped vessels of its kind in the country.

NRC Environmental is an approved contractor in Washington, Oregon, and California and has been classified as an A through Level E OSRO for Inland and River/Canal Environments by the U.S. Coast Guard. NRC Environmental maintains a fleet of vessels throughout Puget Sound, Grays Harbor, the Columbia River, San Francisco Bay, Long Beach, and San Diego. These vessels can respond to near-shore, harbor or beach spills. NRC Environmental also provides personnel and equipment for shoreline cleanup.

From its West Coast offices NRC Environmental can have trained technicians and the specialized equipment they use – including a variety of skimmers, containment boom, and sorbent materials – available to go anywhere in the Pacific Rim within 24 hours.

Additional response contractors include the following:

Contractor	Capabilities
Pacific Environmental Co. (PENCO)	Onwater and Shoreline Cleanup
Marine Logistics, Inc.	Onwater Cleanup
Pacific Commercial Services	Shoreline Cleanup/Vacuum Trucks
Bering Sea EccoTech	Shoreline Cleanup/Vacuum Trucks
Unitek	Vacuum Trucks
Hawaiian Tug and Barge	Tug and Barge Service

Boom, storage and recovery capabilities for HECO’s contracted OSROs are outlined in Table 3.6-1.

Table 3.6-1
OSRO Capabilities

Contractor	Response Time	Boom (ft.)	Recovery bbls/day	Storage bbls
Clean Islands Council	1-2	14,560	402,143	2,878
NRC Environmental	24	10,000	1,260	1,200
Unitek	2	-	120	60
Hawaiian Tug and Barge	6	-	-	125,000
Pacific Environmental (PENCO)	2	1,000	-	1,263
Marine Logistics, Inc.	2	1,000	-	186
HECO/Chevron/Tesoro AST	-	-	-	176,000

3.6.1 Response Equipment Inspections

HECO relies upon its response contractors to maintain equipment and conduct the required inspections and exercises. Records of equipment inspections and exercises are available from the response contractors.

3.6.2 Clean Islands Council

CLEAN ISLANDS COUNCIL

179 Sand Island Access Road
Honolulu, HI 96819
(808) 845-8465

CLEAN ISLANDS COUNCIL

179 Sand Island Access Road
Honolulu, Hawaii 96819
(808) 845-8465
(808) 845-8457 Fax

November 22, 2011

Hawaiian Electric Company
P.O. Box 2750
Honolulu, Hawaii 96840-0001

Attention: Mr. Kirk Tomita

Re: Letter of intent to respond to an oil spill incident.

The Clean Islands Council Inc. (CIC) is a U.S. Coast Guard classified level MM OSRO, cooperative designed to respond to member spills at locations within our "Area of Interest". Our defined "Area of Interest" includes the commercial harbors and waters surrounding the main Hawaiian Islands.

This is to advise you that **Hawaiian Electric Company** is a member in good standing of Clean Islands Council, Inc. We will provide oil containment and cleanup services according to the terms and conditions of the Clean Islands Council's Services Agreement. These Services include Tier One and Partial Tier Two Dispersant response in accordance with the new requirements of 33 CFR 154 and 155. The Clean Islands Council has an MOA with both MSRC and NRC for a complete dispersant response capability. A member must have an Agreement with both CIC and MSRC or NRC to access complete dispersant response capability. In addition, the Clean Islands Council has trained Aerial Observers and contracts in place to provide these observers to our Members. By this letter we give you permission to list us in your plans as part of your dispersant capability and your aerial observation capability.

The Clean Islands Council Inc. will respond to a call out by **Hawaiian Electric Company**, or your designated representative, on behalf of your interests in the Hawaiian Islands and/or the vessels listed in your Vessel Response Plan (VRP) in an actual or potential spill of liquid hydrocarbons originating within our "Area of Interest".

Very truly yours,

Kim Beasley

Kim Beasley
General Manager

KPB/kj

Visit our website at: www.cleanislands.org

CIC Equipment List by Location

Location	ID No.	General ID	Description	Qty	Unit
Spill Center	2-182-3	Storage Systems	2400 Gallon Fast Tank	1	Each
Spill Center	2-183-2	Storage Systems	20,000 Gallon Storage Bladders	1	Each
Spill Center	2-183-3	Storage Systems	20,000 Gallon Storage Bladders	1	Each
Spill Center	2-183-4	Storage Systems	20,000 Gallon Storage Bladders	1	Each
Spill Center	2-183-5	Storage Systems	20,000 Gallon Storage Bladders	1	Each
Spill Center	2-164-3-204WDV	Boat Trailer	Spectrum Shopbuilt Trailer	1	Each
Spill Center	2-164-5-243WDR	Boat Trailer	Dilly Boat Trailer	1	Each
Spill Center	2-160-1-925TGU	Vehicle	Ford F350 Stake Truck	1	Each
Spill Center	2-223-2	Package	Small Decon Station	1	Each
Spill Center	2-162-1-FRV467	Vehicle	Buick Response Car	1	Each
Spill Center	2-128-5	Ocean Boom	Expandi Roto-Pack	750	Feet
Spill Center	2-182-2	Storage Systems	2400 Gallon Fast Tank	1	Each
Spill Center	9-180-1	Storage Systems	5 Cu. Meter RO-Tank - TSBs	1	Each
Spill Center	2-182-4	Storage Systems	2400 Gallon Fast Tank	1	Each
Spill Center	9-182-1	Storage Systems	2400 Gallon Fast Tank	1	Each
Spill Center	2-125-1-614WDN	Boom Trailer	Spectrum Trailer With Acme Boom	1000	Feet
Spill Center	2-144-1	Skimmer	Kaiser AG OELA Model 3	1	Each
Spill Center	2-144-2	Skimmer	Kaiser AG OELA Model 3	1	Each
Spill Center	2-144-3	Skimmer	Kaiser AG OELA Model 3	1	Each
Spill Center	2-167-2	Boom Boat	15 Ft. Fiberglass Under Pier Boat	1	Each
Spill Center	2-128-6	Ocean Boom	Expandi Roto-Pack	650	Feet
Spill Center	2-163-1	Dispersant Trailer	Trailer With 2 Dispersant Bucket Systems	1	Each
Spill Center	2-182-1	Storage Systems	2400 Gallon Fast Tank	1	Each
Spill Center	2-142-1	Skimmer	Mini Walosep	1	Each
Spill Center	2-145-3	Skimmer	Oil Mop OMI 1-4D	1	Each
Spill Center	2-145-2	Skimmer	Oil Mop OMI 1-4D Trailer Mounted	1	Each
Spill Center	2-145-4	Skimmer	Aquacat RBS 10 Brush & Disc	1	Each
Spill Center	8-145-5	Skimmer	Lori 4 Brush Side Mounted	1	Each
Spill Center	1-132-1	Package	Harbor Boom Lighting Systems	1	Each
Spill Center	2-232-2	Package	Large Heat Stress Shade Station	1	Each
Spill Center	1-295-1	Miscellaneous	Dr. Powerwagon/Powered Wagon	1	Each
Spill Center	2-145-1	Skimmer	Oil Mop OMI 11-9D	1	Each

Location	ID No.	General ID	Description	Qty	Unit
Spill Center	2-143-2	Skimmer	GT 185 Ocean Skimmer	1	Each
Spill Center	2-183-1	Storage Systems	20,000 Gallon Storage Bladders	1	Each
Spill Center	2-125-3-619WDN	Boom Trailer	Spectrum Trailer With Acme Boom	1000	Feet
Spill Center	2-167-4	Boom Boat	13.5 Ft Boston Whaler With O/B	1	Each
Spill Center	2-141-1	Skimmer	Slickbar Slurp Wier	1	Each
Spill Center	2-180-1	Storage Systems	5 Cu. Meter RO-Tank - TSBs	1	Each
Spill Center	2-180-2	Storage Systems	5 Cu. Meter RO-Tank - TSBs	1	Each
Spill Center	2-180-3	Storage Systems	5 Cu. Meter RO-Tank - TSBs	1	Each
Spill Center	2-125-2-616WDN	Boom Trailer	Spectrum Trailer With Acme Boom	1000	Feet
Spill Center	2-140-3	Skimmer	Skim Pack Model 4200	1	Each
Spill Center	2-140-2	Skimmer	Skim Pack Model 4200	1	Each
Spill Center	2-140-1	Skimmer	Skim Pack Model 4200	1	Each
Spill Center	2-223-1	Package	Small Decon Station	1	Each
Spill Center	2-165-2	Beach Trailer	Trailer With Beach Cleanup Package	1	Each
Spill Center	2-143-1	Skimmer	GT 185 Ocean Skimmer	1	Each
Spill Center	2-149-1	Power Pack	ASI 16TSO Hydraulic Power Pack	1	Each
Spill Center	2-191-4	Pump	2" Gas Diaphragm Pump	1	Each
Spill Center	2-191-2	Pump	2" Double Diaphragm Pump W/ 25' Hose	1	Each
Spill Center	2-191-1	Pump	2" Double Diaphragm Pump W/ 25' Hose	1	Each
Spill Center	2-190-4	Pump	Diesel Powered Php	1	Each
Spill Center	2-243-1	API Separator	Skid Mounted Fiberglass	1	Each
Spill Center	2-190-3	Pump	Diesel Powered PHP	1	Each
Spill Center	2-190-2	Pump	Diesel Powered PHP	1	Each
Spill Center	2-190-1	Pump	Diesel Powered PHP	1	Each
Spill Center	2-150-2	Power Pack	Power Pack Control Table	1	Each
Spill Center	2-225-1	Package	NRC Environmental 25'x50 Large Decon Pool	1	Each
Spill Center	2-149-2	Power Pack	ASI 16TSO Hydraulic Power Pack	1	Each
Spill Center	2-193-1	Pump	DOP 250 Pump Package	1	Each
Spill Center	2-171-2	Vessel	24 Foot Pontoon Boat With O/B	1	Each
Spill Center	2-228-2	Package	Large Fishtote Workvest Pack 50 Sets	75	Sets
Spill Center	2-229-1	Package	Large Personnel Zone Control Station	1	Each
Spill Center	2-241-2	API Separator	Versitek API Separator	1	Each
Spill Center	2-241-1	API Separator	Versitek API Separator	1	Each
Spill Center	2-229-2	Package	Large Personnel Zone Control Station	1	Each

Location	ID No.	General ID	Description	Qty	Unit
Spill Center	2-229-3	Package	Large Personnel Zone Control Station	1	Each
Spill Center	2-232-1	Package	Large Heat Stress Shade Station	1	Each
Spill Center	2-128-7	Ocean Boom	Expandi Roto-Pack	300	Feet
Spill Center	2-150-1	Power Pack	Power Pack Control Table	1	Each
Spill Center	2-227-3	Package	PPE Overpack 50 Sets	75	Sets
Spill Center	2-164-1-887WDD	Boat Trailer	Foothill Boat Trailer	1	Each
Spill Center	2-166-1	Package	Lightstand Trailer W/ Onan Gen.	1	Each
Spill Center	2-191-3	Pump	2” Double Diaphragm Pump W/ 25' Hose	1	Each
Spill Center	2-164-4-326WDP	Boat Trailer	Shoreline Boat Trailer	1	Each
Spill Center	2-194-1	Pump	Acme Floating Circulation Pump	1	Each
Spill Center	2-226-1	Package	Multi Person Hand Washing Basin	1	Each
Spill Center	2-164-2-617WDN	Boat Trailer	Easy Loader Trailer	1	Each
Spill Center	2-167-1	Boom Boat	17 Ft. Boom Boat With O/B	1	Each
Spill Center	2-227-1	Package	PPE Overpack 50 Sets	75	Sets
Spill Center	2-227-4	Package	PPE Overpack 50 Sets	75	Sets
Spill Center	2-228-1	Package	Large Fishtote Workvest Pack 50 Sets	75	Sets
Spill Center	2-125-5-642HYE	Boom Trailer	Acme Trailer	0	Feet
Spill Center	2-293-1	Miscellaneous	Karcher Steam Pressure Washer	1	Each
Spill Center	2-168-1	Skiff	10 Foot Under Pier Skiff With Oars	1	Each
Spill Center	2-194-2	Pump	Acme Floating Washdown Pump	1	Each
Spill Center	2-227-2	Package	PPE Overpack 50 Sets	75	Sets
Rainbow Marina	2-125-4-568WDS	Boom Trailer	Spectrum Trailer With Acme Boom	1000	Feet
Pt. Allen	5-220-1	Package	PPE Site Package 25 Sets	37	Sets
Pt. Allen	5-228-1	Package	Small Workvest Pack 20 Sets	30	Each
Pt. Allen	5-168-1	Skiff	8 Foot Under Pier Skiff With Paddles	1	Each
Pt. Allen	5-191-1	Pump	2” Double Diaphragm Pump W/ 25' Hose	1	Each
Pt. Allen	5-190-1	Pump	Diesel Powered Php	1	Each
Pt. Allen	5-164-1-251WDP	Boat Trailer	Calkins Boat Trailer	1	Each
Pt. Allen	5-125-1-754KXM	Boom Trailer	Spectrum Trailer With Acme Boom	1000	Feet
Pt. Allen	5-191-2	Pump	2” Gas Diaphragm Pump	1	Each
Pt. Allen	5-182-1	Storage Systems	2400 Gallon Fast Tank	1	Each

Location	ID No.	General ID	Description	Qty	Unit
Pt. Allen	5-180-1	Storage Systems	5 Cu. Meter RO-Tank – TSBS	1	Each
Pt. Allen	5-242-1	API Separator	Acme Floating Separator	1	Each
Pt. Allen	5-320-1	Sorbent	Viscous Sweep/Drag Net	20	Bale
Pt. Allen	5-126-1	Boom Container	Container With Boom	1000	Feet
Pt. Allen	5-182-2	Storage Systems	2000 Gallon Fast Tank	1	Each
Pt. Allen	5-321-1	Sorbent	Sorbent Sweep	20	Bale
Pt. Allen	5-144-1	Skimmer	Kaiser AG OELA Model 3	1	Each
Pt. Allen	5-140-1	Skimmer	Skim Pack Model 4200	1	Each
Pt. Allen	5-241-1	API Separator	Versitek API Separator	1	Each
Pt. Allen	5-322-1	Sorbent	8" Sorbent Boom	20	Bale
Pt. Allen	5-323-1	Sorbent	Sorbent Pads	20	Bale
Pt. Allen	5-167-1	Boom Boat	17 Ft. Mckee Craft With O/B	1	Each
Pringle	2-130-2	Inflatable Ocean Boom	Vikoma 42" Inflatable	2000	Feet
OSRV	1-130-1	Inflatable Ocean Boom	Oil Stop 42" Auto Boom "J" Shape On Boom Reel	650	Feet
OSRV	1-150-2	Power Pack	Power Pack Control Table	1	Each
OSRV	8-294-1	Miscellaneous	Expandi Roto Pack Turn Table	1	Each
OSRV	1-150-1	Power Pack	Power Pack Control Table	1	Each
OSRV	1-149-2	Power Pack	American Marine Hydraulic Power Pack	1	Each
OSRV	1-128-1	Ocean Boom	Expandi 4300 On Boom Reel	1350	Feet
OSRV	2-161-1-681TJF	Vehicle	Ford Response Van	1	Each
OSRV	2-162-2-253TNT	Vehicle	Nissan Response P/U Truck	1	Each
OSRV	1-167-1	Boom Boat	10 Ft. Avon Boom Tender	1	Each
OSRV	1-128-2	Ocean Boom	Expandi Roto-Pack	750	Feet
OSRV	8-143-1	Skimmer	Gt 185 Ocean Skimmer	1	Each
OSRV	1-128-3	Ocean Boom	Expandi Roto-Pack	500	Feet
OSRV	1-130-2	Inflatable Ocean Boom	EFC 76" Ocean Boom "U" Shapes	110	Feet
OSRV	8-143-2	Skimmer	Gt 185 Ocean Skimmer	1	Each
OSRV	1-149-1	Power Pack	Lister Hydraulic Power Pack	1	Each
Nawiliwili	7-220-1	Package	Ppe Site Package 25 Sets	37	Sets
Nawiliwili	7-140-1	Skimmer	Skim Pack Model 4200	1	Each
Nawiliwili	7-320-1	Sorbent	Viscous Sweep/Drag Net	30	Bale
Nawiliwili	7-321-1	Sorbent	Sorbent Sweep	30	Bale
Nawiliwili	7-322-1	Sorbent	8" Sorbent Boom	30	Bale
Nawiliwili	7-167-1	Boom Boat	17 Ft. Mckee Craft With O/B	1	Each

Location	ID No.	General ID	Description	Qty	Unit
Nawiliwili	7-164-1-024KXM	Boat Trailer	Dilly Boat Trailer	1	Each
Nawiliwili	7-228-1	Package	Medium Workvest Pack 30 Sets	45	Sets
Nawiliwili	7-125-1-846KXM	Boom Trailer	Spectrum Trailer With Acme Boom	1000	Feet
Nawiliwili	7-241-1	API Separator	Versitek Api Separator	1	Each
Nawiliwili	7-323-1	Sorbent	Sorbent Pads	30	Bale
Nawiliwili	7-227-1	Package	Ppe Overpak 50 Sets	75	Sets
Nawiliwili	7-182-2	Storage Systems	2000 Gallon Fast Tank	1	Each
Nawiliwili	7-182-1	Storage Systems	2400 Gallon Fast Tank	1	Each
Nawiliwili	7-180-1	Storage Systems	5 Cu. Meter Ro-Tank - Tsbs	1	Each
Nawiliwili	7-168-1	Skiff	8 Foot Under Pier Skiff With Paddles	1	Each
Nawiliwili	7-126-1	Boom Container	Container With Boom	1000	Feet
Nawiliwili	7-190-1	Pump	Diesel Powered Php	1	Each
Nawiliwili	7-191-1	Pump	2” Gas Diaphragm Pump	1	Each
Molokai	10-322-1	Sorbent	8” Sorbent Boom	20	Bale
Molokai	10-180-1	Storage Systems	5 Cu. Meter Ro-Tank - Tsbs	1	Each
Molokai	10-220-1	Package	Ppe Site Package 25 Sets	37	Sets
Molokai	10-140-1	Skimmer	Skim Pack Model 4200	1	Each
Molokai	10-323-1	Sorbent	Sorbent Pads	20	Bale
Molokai	10-241-1	API Separator	Versitek Api Separator	1	Each
Molokai	10-125-1-226MUF	Boom Trailer	Acme Trailer With Acme Boom	1000	Feet
Molokai	10-321-1	Sorbent	Sorbent Sweep	20	Bale
Molokai	10-320-1	Sorbent	Viscous Sweep/Drag Net	20	Bale
Molokai	10-228-1	Package	Small Workvest Pack 30 Sets	45	Each
Molokai	10-167-1	Boom Boat	17 Ft. Mckee Craft With O/B	1	Each
Molokai	10-164-1-918WDE	Boat Trailer	Calkins Boat Trailer	1	Each
Molokai	10-190-1	Pump	Diesel Powered Php	1	Each
MCBH-Kaneohe	1-234-1	Package	20' Containerized Bird Hospital	1	Each
Maui Marriot Hotel	4-233-1	Package	Hotel Zone Control Package	1	Each
Lanai	11-144-1	Skimmer	Kaiser Ag Oela Model 3	1	Each
Lanai	11-241-1	API Separator	Versitek Api Separator	1	Each
Lanai	11-228-1	Package	Small Workvest Pack 30 Sets	45	Each
Lanai	11-180-1	Storage Systems	5 Cu. Meter Ro-Tank - Tsbs	1	Each
Lanai	11-167-1	Boom Boat	16.5 Ft. Boston Whaler With O/B	1	Each

Location	ID No.	General ID	Description	Qty	Unit
Lanai	11-140-1	Skimmer	Skim Pack Model 4200	1	Each
Lanai	11-323-1	Sorbent	Sorbent Pads	20	Bale
Lanai	11-125-1	Boom Trailer	Acme Trailer With Acme Boom	1000	Feet
Lanai	11-321-1	Sorbent	Sorbent Sweep	20	Bale
Lanai	11-220-1	Package	Ppe Site Package 25 Sets	37	Sets
Lanai	11-320-1	Sorbent	Viscous Sweep/Drag Net	20	Bale
Lanai	11-190-1	Pump	Diesel Powered Php	1	Each
Lanai	11-191-1	Pump	2” Gas Diaphragm Pump	1	Each
Lanai	11-164-1-595KXB	Boat Trailer	Foothill Boat Trailer	1	Each
Lanai	11-322-1	Sorbent	8” Sorbent Boom	20	Bale
Kawaihae	6-241-1	API Separator	Versitek Api Separator	1	Each
Kawaihae	6-167-1	Boom Boat	17 Ft. Boston Whaler With O/B	1	Each
Kawaihae	6-190-1	Pump	Diesel Powered Php	1	Each
Kawaihae	6-140-1	Skimmer	Skim Pack Model 4200	1	Each
Kawaihae	6-182-1	Storage Systems	2400 Gallon Fast Tank	1	Each
Kawaihae	6-126-1	Boom Container	Container With Boom	1600	Feet
Kawaihae	6-180-1	Storage Systems	5 Cu. Meter Ro-Tank - Tsbs	1	Each
Kawaihae	6-182-2	Storage Systems	2000 Gallon Fast Tank	1	Each
Kawaihae	6-191-1	Pump	2” Double Diaphragm Pump W/ 25' Hose	1	Each
Kawaihae	6-168-1	Skiff	8 Foot Under Pier Skiff With Paddles	1	Each
Kawaihae	6-164-1-370WDA	Boat Trailer	Calkins Boat Trailer	1	Each
Kawaihae	6-320-1	Sorbent	Viscous Sweep/Drag Net	20	Bale
Kawaihae	6-321-1	Sorbent	Sorbent Sweep	20	Bale
Kawaihae	6-125-1-641HYE	Boom Trailer	Acme Trailer With Acme Boom	1000	Feet
Kawaihae	6-228-1	Package	Small Workvest Pack 20 Sets	30	Each
Kawaihae	6-220-1	Package	Ppe Site Package 25 Sets	37	Sets
Kawaihae	6-322-1	Sorbent	8” Sorbent Boom	20	Bale
Kawaihae	6-323-1	Sorbent	Sorbent Pads	20	Bale
Kahului	4-182-1	Storage Systems	2400 Gallon Fast Tank	1	Each
Kahului	4-182-2	Storage Systems	2000 Gallon Fast Tank	1	Each
Kahului	4-126-2	Boom Container	Container With Boom	1700	Feet
Kahului	4-167-1	Boom Boat	17 Ft. Mckee Craft With O/B	1	Each
Kahului	4-320-1	Sorbent	Viscous Sweep/Drag Net	30	Bale
Kahului	4-321-1	Sorbent	Sorbent Sweep	30	Bale
Kahului	4-322-1	Sorbent	8” Sorbent Boom	30	Bale

Location	ID No.	General ID	Description	Qty	Unit
Kahului	4-164-1-719MUE	Boat Trailer	Calkins Boat Trailer	1	Each
Kahului	4-242-1	API Separator	Acme Floating Separator	1	Each
Kahului	4-241-1	API Separator	Versitek Api Separator	1	Each
Kahului	4-126-1	Boom Container	Container With Boom	1000	Feet
Kahului	4-323-1	Sorbent	Sorbent Pads	30	Bale
Kahului	4-144-1	Skimmer	Kaiser Ag Oela Model 3	1	Each
Kahului	4-125-1-455MUC	Boom Trailer	Spectrum Trailer With Acme Boom	1000	Feet
Kahului	4-180-1	Storage Systems	5 Cu. Meter Ro-Tank - Tsbs	1	Each
Kahului	4-191-1	Pump	2” Double Diaphragm Pump W/ 25' Hose	1	Each
Kahului	4-220-1	Package	Ppe Site Package 25 Sets	37	Sets
Kahului	4-191-2	Pump	2” Gas Diaphragm Pump	1	Each
Kahului	4-168-1	Skiff	10 Foot Aluminum John Boat With Oars	1	Each
Kahului	4-140-1	Skimmer	Skim Pack Model 4200	1	Each
Kahului	4-228-1	Package	Medium Workvest Pack 30 Sets	45	Each
Kahului	4-190-1	Pump	Diesel Powered Php	1	Each
Kahului	4-227-1	Package	Ppe Overpack 50 Sets	75	Sets
Kahe Power Plant	1-146-1	Skimmer	Vikoma Mini Fast Flow Skimmer	1	Each
Kahe Power Plant	2-168-2	Skiff	9 Foot Under Pier Skiff With 4hp Outboard	1	Each
Kahe Power Plant	2-125-6	Boom Trailer	Container W/ 1000' 44” Acme Ocean Boom	1	Each
Kahe Power Plant	2-125-7	Boom Trailer	Container W/ 1000' 44” Acme Ocean Boom	1	Each
Honolulu Harbor	2-167-3	Boom Boat	14 Ft. Under Pier Boat	1	Each
Honolulu Harbor	2-169-1	Boom Boat	24 Fast Response Boom Boat	1	Each
Honolulu Harbor	2-127-1	Boom Reel	Reel With Harbor Boom	1700	Feet
Honolulu Harbor	2-127-2	Boom Reel	Reel With Harbor Boom	800	Feet
Honolulu Harbor	2-170-1	OSRV	Large On-Water Skimming Platform	1	Each
Hilo	3-126-1	Boom Container	Container With Boom	1000	Feet
Hilo	3-169-1	Boom Boat	21 Fast Response Boom Boat	1	Each
Hilo	3-125-1-	Boom Trailer	Spectrum Trailer With Acme Boom	1000	Feet

Location	ID No.	General ID	Description	Qty	Unit
	340HGY				
Hilo	3-167-1	Boom Boat	14 Ft. Nearshore Boom Boat	1	Each
Hilo	3-194-1	Pump	Acme Floating Washdown Pump	1	Each
Hilo	3-191-2	Pump	2” Gas Diaphragm Pump	1	Each
Hilo	3-182-2	Storage Systems	2000 Gallon Fast Tank	1	Each
Hilo	3-182-1	Storage Systems	2400 Gallon Fast Tank	1	Each
Hilo	3-323-1	Sorbent	Sorbent Pads	30	Bale
Hilo	3-322-1	Sorbent	8” Sorbent Boom	30	Bale
Hilo	3-321-1	Sorbent	Sorbent Sweep	30	Bale
Hilo	3-320-1	Sorbent	Viscous Sweep/Drag Net	50	Bale
Hilo	3-180-1	Storage Systems	5 Cu. Meter Ro-Tank - Tsbs	1	Each
Hilo	3-144-1	Skimmer	Kaiser Ag Oela Model 3	1	Each
Hilo	3-140-1	Skimmer	Skim Pack Model 4200	1	Each
Hilo	3-191-1	Pump	2” Double Diaphragm Pump W/ 25' Hose	1	Each
Hilo	3-168-1	Skiff	10 Foot Aluminum John Boat With Oars	1	Each
Hilo	3-241-1	API Separator	Versitek Api Separator	1	Each
Hilo	3-190-1	Pump	Diesel Powered Php	1	Each
Hilo	3-242-1	API Separator	Acme Floating Separator	1	Each
Hilo	3-164-1-628WDN	Boat Trailer	Calkins Boat Trailer	1	Each
Hilo	3-228-1	Package	Medium Workvest Pack 30 Sets	45	Each
Hilo	3-227-1	Package	Ppe Overpack 50 Sets	75	Sets
Hilo	3-220-1	Package	Ppe Site Package 25 Sets	37	Sets
Hilo	3-224-1	Package	Large Shade Station	1	Each
Hilo	3-164-2-421HYH	Boat Trailer	Easy Loader Trailer	1	Each
Barge Nu'uanu	2-128-3	Ocean Boom	Expandi Roto-Pack	750	Feet
Barge Noho Hele	2-128-4	Ocean Boom	Expandi Roto-Pack	600	Feet
Barge Hui Mana	2-128-2	Ocean Boom	Expandi Roto-Pack	650	Feet
Barge Holokai	2-128-1	Ocean Boom	Expandi Roto-Pack	650	Feet
Barber's Pt.	9-220-1	Package	Ppe Site Package 25 Sets	37	Sets
Barber's Pt.	9-140-1	Skimmer	Skim Pack Model 4200	1	Each
Barber's Pt.	9-190-1	Pump	Diesel Powered Php	1	Each
Barber's Pt.	9-168-1	Skiff	8 Foot Under Pier Skiff With Paddles	1	Each
Barber's Pt.	9-228-1	Package	Medium Workvest Pack 30 Sets	45	Each

Location	ID No.	General ID	Description	Qty	Unit
Barber's Pt.	9-241-1	API Separator	Versitek Api Separator	1	Each
Barber's Pt.	9-126-1	Boom Container	Container With Boom	1000	Feet
Barber's Pt.	9-125-1-615WDN	Boom Trailer	Spectrum Trailer With Acme Boom	1000	Feet
Barber's Pt.	9-167-1	Boom Boat	21 Ft. Boston Whaler With Twin O/B's	1	Each
Barber's Pt.	9-320-1	Sorbent	Viscous Sweep/Drag Net	20	Bale
Barber's Pt.	9-321-1	Sorbent	Sorbent Sweep	20	Bale
Barber's Pt.	9-322-1	Sorbent	8” Sorbent Boom	20	Bale
Barber's Pt.	9-323-1	Sorbent	Sorbent Pads	20	Bale
Barber's Pt.	9-182-2	Storage Systems	2400 Gallon Fast Tank	1	Each

3.6.3 National Response Corporation Environmental Services

NRC ENVIRONMENTAL SERVICES

20500 Richmond Beach Drive NW
Seattle, Washington 98177
1-800-337-7455

NATIONAL RESPONSE CORPORATION

January 3, 2012

Kirk Tomita
Sr. Environmental Scientist
Hawaiian Electric Co. Inc.
PO Box 2750
Honolulu, HI 96840-0001

RE: OSRO Coverage for Hawaiian Electric Company, Maui Electric Company, and Hawaii Electric Light Comany Facilities

RESPONSE CONTRACTOR CERTIFICATION

This letter confirms that National Response Corporation (NRC) has a Facility Standby Services Agreement, Number 4279, with Hawaiian Electric and Light Co. Inc. This Agreement provides OSRO services for the Hawaiian Electric Company, Maui Electric Company, and Hawaii Electric Light Company facilities located in the state of Hawaii. These facilities are authorized to reference NRC resources and certifications in its state and/or federal contingency and response planning documents pursuant to terms of the Agreement which provides for spill response equipment and personnel within 60 hours.

NRC is a California State approved Oil Spill Response Organization (OSRO), a Primary Response Contractor (PRC) in Washington and Oregon, and has been rated by the U.S. Coast Guard as an OSRO meeting all classification ratings for Rivers/Canals, Inland and Oceans environments, as well as providing Shoreline response capabilities. NRC is capable of beginning mobilization of response efforts within one hour of a spill notification.

If you have any questions, or if I can be of further assistance, please don't hesitate to contact me either by phone at 206-730-3993 or by e-mail at sbarton@nrces.com. For spill response notification call:

1-800-337-7455 (1-800-33 SPILL)

Sincerely,

Stephanie Barton

Stephanie Barton
Director, Emergency Response Programs
NRC Environmental Services Inc.

NRC Equipment List by Location

RECOVERY RESOURCES

EQUIPMENT	QUANTITY	LOCATION	BBLS / 24 HR
Vikoma Cascade	1	Honolulu, HI	5,520
Vicoma Sea 50	1	Honolulu, HI	1,509
Action Petroleum Drum/Disc/Brush	1	Honolulu, HI	1,234
Elastec Sea Skater	2	Honolulu, HI	5,486
Total Available 36 Hours (20% derated)			**13,749**
Morris/MI-30	2	Seattle, WA	1,988
AquaGuard RBS-10	1	Seattle, WA	662
Desmi Wier Skimmer	2	Seattle, WA	6,034
Cascade 5465	1	Seattle, WA	5,465
Marco /1C	2	Seattle, WA	7,176
Total Available 60 Hours (20%derated)			**35,074**

CONTAINMENT RESOURCES

EQUIPMENT	STORAGE	LOCATION	FEET
Inflatable 43"	20' Container	Kapolei, HI	2,000
Harbor Boom 8x12"	28' Containers (2)	Kapolei, HI	4,500
Harbor Boom 8x12"	28' Containers (2)	Honolulu, HI	4,500
Harbor Boom 8x12"	40' Container	Kapolei, HI	5,000
Harbor Boom 8x12"	40' Container	Kapolei, HI	6,000
Harbor Boom 8x12"	40' Container	Kapolei, HI	4,000
Ocean Boom 42"	45' Containers (4)	Kapolei, HI	8,000
Harbor Boom 8x12"	20' Container (2)	Seattle, WA	6,000
Total Available 36 Hours			**40,000**
Contractor Boom, 8" x 12"	20' Container	Astoria, OR	2,000
Contractor Boom, 8" x 12"	40' Container	Portland, OR	4,400
Ocean Boom 42"	20' Container	Long Beach, CA	2,000
Contractor Boom, 8" x 12"	20' Container	Alameda, CA	3,000
Total Available 60 Hours			**51,400**

STORAGE RESOURCES

EQUIPMENT	QUANTITY	LOCATION	BBLS
Dracone/Bladder	2	Kapolei, HI	200
No 'eau	1	Honolulu, HI	15,000
Namoku	1	Honolulu, HI	18,500
Noho Hele	1	Honolulu, HI	18,500
Bladder Tank	3	Seattle, WA	714
Dracone/Bladder	2	Long Beach, CA	200
Total Available 36 Hours			**53,114**
Holokai	1	Honolulu, HI	15,000
Hui Mana	1	Honolulu, HI	20,000
Nu'uanu	1	Honolulu, HI	20,000
Total Available 60 Hours			**108,114**

THIS PAGE INTENTIONALL LEFT BLANK

3.7 TRAINING AND DRILLS

3.7.1 Response Training

Training is designed to improve safety awareness and response capability to minimize potential health effects, environmental impact and property damage, as well as to comply with applicable regulations.

In the event of a major incident, volunteers from the community may wish to participate in the cleanup. Volunteers will report to the appropriate Field Supervisor or Contractor. However, it must be noted that Occupational Safety and Health Administration (OSHA) Section 1910.120 requires that a minimum amount of training in hazardous material handling be done before any work is performed. HECO may consider utilization of properly trained volunteers, but cannot commit to providing the required training to volunteers.

HECO's training program will be based on the Training Reference for Oil Spill Response, and will incorporate those portions which apply to operations and spill response activities at the Kahe Generating Station.

Training for Qualified Individuals

In response to the Oil Pollution Act of 1990 (OPA 90), HECO has identified a Qualified Individual (QI) who will act as the point of contact between the federal government and the facility. The responsibilities of the QI go far beyond that of a mere intermediary. As defined in OPA, the QI is that person identified in a response plan having “full authority to implement removal actions" on behalf of the plan holder. The QI must have the authority to commit the financial resources of the company to prevent or clean up a spill.

Although the QI is not expected to be a technical expert in vessel salvage, clean-up technology, or pipeline repair, the QI must be familiar enough with HECO's response plan to know what measures must be taken under the circumstances. The QI must ensure adequate steps are taken to mitigate the situation and should know the capabilities of any oil spill removal organization (OSRO) which is contracted to respond on behalf of HECO. The QI should be thoroughly familiar with procedures to activate and contract with HECO's OSROs.

Training for Spill Management Teams

The function of the spill management team is to assist or relieve the Qualified Individual in the actual response to an oil spill. The team staffs the organizational structure HECO has identified to manage response plan implementation. The team may also provide the operational oversight of field response personnel.

Although the size and qualifications of the spill management team have not been federally mandated, the team must be adequately staffed to ensure a credible response depending on the size of the spill. The number of members will be expected to grow if the situation warrants 24 hour per day operations and a cast of several thousand clean-up personnel. A well-structured response organization will be able to accommodate changes in the size of the spill management team and rapidly integrate additional members.

The response management organization is built around five major management activities:

- Command;
- Operations;
- Planning;
- Logistics; and
- Administration and Finance.

The key to training spill management team members is to train them according to their functional role within the response organization. Members staffing an operations center need to be trained differently from members whose primary function is logistics. Many of HECO's personnel will be able to draw upon skills they use and training they have obtained in everyday activities of facility operations. Personnel designated to administer the financial duties of spill response and cost documentation are especially likely to have such experience. Other personnel will be asked to fill roles which they may only perform in a crisis situation; therefore, due to the infrequency of an actual crisis, these personnel would need extra periodic training to perform crisis functions.

If the individual will always fill the same spill management team function, training requirements will be narrowed in scope. If HECO desires greater flexibility in use of their personnel and redundancy in available knowledge in case key personnel are unavailable, HECO may choose to add to the curricula presented to team members. The goal is to train these personnel so that the team can function as a coordinated unit and direct the cleanup activities or preventative measures in an efficient and timely manner.

Training for Facility Personnel

Facility personnel are trained in response actions to be carried out under the plan to ensure the safety of the facility and to mitigate or prevent discharges. Facility personnel are responsible for performing specific procedures to mitigate or prevent a discharge or potential discharge.

Table 3.7-1 provides suggested elements which HECO will consider for incorporation into the training program for the QIs, spill management team and facility personnel. The material should not be considered as mandatory training nor should it be considered all-inclusive. A training program which provided all of the suggested training elements would certainly be very comprehensive. Team members receiving this training would have an excellent educational foundation to help them play a highly pro-active role in HECO's response organization. HECO will determine the actual role of team members in their organization and customize the training programs accordingly.

Table 3.7-1
Suggested Training Elements

✓	Captain of the Port (COTP) Zones or Environmental Protection Agency (EPA) Regions in which the facility is located.
✓	Notification procedures and requirements for facility owners or operators; internal response organizations; federal and state agencies; and contracted oil spill removal organizations (OSROs) and the information required for those organizations.
✓	Communication system used for the notifications.
✓	Information on the materials transferred, stored, or used by the facility, including familiarity with the material safety data sheets, special handling procedures, health and safety hazards, spill and fire fighting procedures.
✓	Procedures the facility personnel may use to mitigate or prevent any discharge or a substantial threat of a discharge of oil resulting from facility operational activities associated with internal or external transfers, storage, or use.
✓	Facility personnel responsibilities, and procedures for use of facility equipment which may be used to mitigate an oil discharge.
✓	Operational capabilities of the contracted OSROs to respond to the following: ➢ Average most probable discharge (small spill); ➢ Maximum most probable discharge (medium spill); and ➢ Worst case discharge.
✓	Responsibilities and authorities of the Qualified Individual as described in the facility response plan and company response organization.
✓	The organizational structure that will be used to manage the response actions, including: ➢ Command and control ➢ Public information ➢ Safety ➢ Liaison with government agencies ➢ Spill response operations ➢ Planning ➢ Logistics support ➢ Finance
✓	The responsibilities and duties of each oil spill management team member within the organizational structure.
✓	The drill and exercise program to meet federal and state regulations as required under OPA'90.
✓	The role of the Qualified Individual in the post discharge review of the plan to evaluate and validate its effectiveness.
✓	Area Contingency Plan (ACP) for the area in which the facility is located.

Table 3.7-1 (*Continued*)
Suggested Training Elements

✓	The National Contingency Plan (NCP).
✓	Roles and responsibilities of federal and state agencies in pollution response.
✓	Available response resources identified in response plan.
✓	Contracting and ordering procedures to acquire oil spill removal organization resources identified in the response plan.
✓	(OSHA requirements for worker health and safety (29 CFR 1910.120).
✓	Incident Command System/Unified Command System
✓	Public affairs.
✓	Crisis management.
✓	Procedures for obtaining approval for dispersant use or in-situ burning of the spill.
✓	Oil spill trajectory analyses.
✓	Sensitive biological areas.

Training Records

The HECO Environmental Department maintains records of the training received by facility personnel, and will make these records available for inspection upon request by the Administrator of the EPA or PHMSA. These records are maintained at the facility for three years.

3.7.2 Levels of Training

Incident Command System Training

All member of the Spill Management Team assigned to Command Post duties should receive at least 4 hours of ICS training. At a minimum, the training should cover the following:

- Primary Management Functions
- Organization
- Management by Objectives
- Features of a Unified Command
- Organizational Flexibility
- Common Terminology

- Resource Accountability and Management
- Communications
- Development of the Incident Action Plan
- The Planning Cycle

Those specifically assigned to Chief and Unit Leader positions in the Operations and Planning Sections should also receive an additional 2 hours of position specific training.

Hazwoper Training

As specified in the Section 2200 of the HACP, all field responders are required to have 4-24 hours of Hazwoper training, depending on their assignment. Supervisors must have 40 +8 hours of Hazwoper training. The following is an excerpt from the HACP for Beach Cleaning Operations:

Direct Beach Cleaning Operations

Permanent employees of oil spill response contractor.. 24 hrs
Permanent employees of operating (oil) companies' HAZMAT teams including the PRP
(Potential Responsible Party)..24 hrs
Supervisory and managerial staff of oil spill response contractors .... 40 + 8 hrs
Supervisory and managerial staff of operating oil companies including the PRP......... 40 + 8 hrs *
Team members from oil spill response cooperatives... 40 + 8 hrs *
....24 hrs #
Operators of contracted heavy equipment (tractors, graders, etc.) ....4 hrs @
Casual day labor force .... 4 hrs
Any of the above required to distribute biological agents ....24 hrs
On-scene Incident Commander...24 hrs
Federal Response Personnel (EPA, FWS, NOAA, USCG).. 40 hrs

* - If engaged in supervising the cleanup operation on site.
\# - If performing cleanup operation (direct from supervising those operations).
@ - Refer to 29 CFR 1910.120(q)(4), Safety and Health criteria.

The majority of HECO personnel would require 4-24 hours of training.

For the complete list of training requirements, refer to Section 2200 of the HACP.

3.7.3 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 HECO personnel are sufficiently trained for oil spill response. The HECO 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.

The Senior Supervisor is responsible for ensuring that drills are completed and documented as required. Drills for the Kahe Generating Station, and Kahe Pipeline include the following:

Quarterly Notification Drill

The purpose of the quarterly notification drill is to ensure that the Primary or Alternate QI or designee, as designated in the Facility Spill Response Plan (FSRP) 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 FSRP, and confirmation must be received to satisfy the requirements of this exercise.

The quarterly notification drill will be initiated by a qualified Shift Supervisor at the direction of the Senior Supervisor. The drill will be documented using the form provided in Figure 3.7-1. Federal and state agencies do not need to be included in the quarterly notification drill.

At least once a year, the quarterly notification exercise should be conducted during non-business hours.

Annual Spill Management Team Tabletop Drill

Section 3.3 of the FSRP identifies the spill management team. This spill management team will conduct an annual tabletop exercise, in accordance with the NPREP guidance document. The FSRP 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 shall 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. The tabletop exercise will be documented on the Form provided on Figure 3.7-2.

Triennial Cycle

Every 3 years all 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 plan 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

1. Discharge control;

2. Assessment of discharge;
3. Containment of discharge;
4. Recovery of spilled material;
5. Protection of sensitive areas; and
6. Disposal of recovered material and contaminated debris.

Response Support

1. Communications;
2. Transportation;
3. Personnel support;
4. Equipment maintenance and support;
5. Procurement; and
6. Documentation.

HECO will evaluate the components that are applicable from the list above, and add or delete other components as appropriate. HECO 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. HECO is responsible for documenting the components completed in the exercise.

In the triennial cycle, the following exercises must be conducted:

- Twelve (12) Qualified Individual notification exercises;
- Three (3) spill management team tabletop exercises - one must involve a worst case discharge scenario;
- Three (3) unannounced exercises - any of the exercises, with the exception of the QI notification exercise, if conducted unannounced, would satisfy this requirement; and
- Equipment deployment exercises (as described below).

Deployment Drills

Deployment drills are intended to meet objectives including spill containment, environmental protection actions, product recovery and waste storage. Facility-owned response equipment is limited to sorbent materials and personal protective equipment (PPE) as listed in Section 3.5. Facility-owned response equipment is inspected monthly using the checklist provided in Section 3.1. Contracted oil spill response equipment is tested and maintained by OSROs as described in Section 3.6. OSROs are responsible for conducting deployment drills as required and providing documentation of these drills to HECO.

Drill Records

HECO ensures that records sufficient to document drills for facility personnel and the spill management team are maintained for 5 years following completion of drills. Proper documentation for self-certification should include, as a minimum, the following information:

- The type of exercise.
- Date and time of the exercise.
- A description of the exercise.
- The objectives met in the exercise.
- The components of the response plan exercised.
- Lessons learned.

The documentation must be in writing and signed by a Qualified Individual. Records of drills will be maintained on file by the HECO Environmental Department and made available to the EPA or PHMSA.

Figure 3.7-1
QI Notification Exercise

1. Date performed: ____
2. Exercise or actual response? ____________________________________
3. Facility initiating drill: ____
4. Name of person notified: ______________________________________

   Is this person identified in your response plan as QI or designee?

   ____
5. Time initiated: ____

   Time QI or designee responded: __________________________________
6. Method used to contact:

   _____ Telephone

   _____ Pager

   _____ Radio

   _____ Other ____
7. Description of notification procedure:

   ____

   ____

   ____
8. Identify which of the 15 core components of the FSRP were exercised during this particular exercise.

   ____

   ____

   ____

____

Certifying Signature

Retain this form for a minimum of five years

Figure 3.7-2
Spill Management Team (SMT) Tabletop Exercise

1. Date(s) performed: ______________________________

2. Exercise or actual response? ______________________________

   Exercise, announced or unannounced? ______________________________

3. Location of tabletop: ______________________________

4. Time started: ______________________________

   Time completed: ______________________________

5. Response plan scenario used (check one):

   _____ Average Most Probable Discharge

   _____ Maximum Most Probable Discharge

   _____ Worst Case Discharge

   Size of (simulated) spill ________ bbls/gals

6. Described how the following objectives were exercised:

   a) SMT's knowledge of oil-spill response plan:

   ____
   ____
   ____
   ____
   ____
   ____

   b) Proper notifications:

   ____
   ____
   ____
   ____
   ____
   ____

Figure 3.7-2 (Continued)
Spill Management Team Tabletop Exercise

c) Communications system:

____
____
____
____
____
____

d) SMT's ability to access contracted OSRO(s):

____
____
____
____
____
____

e) SMT's ability to coordinate spill response with FOSC, SOSC and applicable agencies:

____
____
____
____
____
____

f) SMT's ability to access sensitive site and resource information in the Area Contingency Plan:

____
____
____
____
____
____

Figure 3.7-2 (Concluded)
Spill Management Team Tabletop Exercise

7. Identify which of the 15 core components of the response plan were exercised during this particular drill:

____
____
____
____
____
____

8. Attach "lesson(s) learned" and person(s) responsible for follow-up of corrective measures.

____

Certifying Signature

Retain this form for a minimum of five years

3.8 Response Planning Standards, and Scenarios

This section identifies response planning levels and describes discharge scenarios for a small spill, medium spill and worst case discharge from the Kahe Generating Station. Worst case discharge calculations for the Kahe Pipeline are presented in Appendix D.

3.8.1 Small Spill Size of the Spill

Drum Rupture

A small discharge at the Kahe Generating Station is a planning volume of 55 gallons and occurs when a drum falls from a pallet, while being carried by a forklift, and ruptures. The incident occurs during normal business hours and is immediately detected by the operator during the loading and unloading process. For the purpose of this scenario it is assumed that the entire contents of the drum (55 gallons) is spilled.

Proximity to Downgradient Wells, Waterways and Drinking Water Intakes

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

[redacted]

Likelihood that the Discharge Will Travel Offsite

Due to close supervision, the discharged material is contained within the boundaries of the facility. It is unlikely that spilled material from this scenario would travel offsite.

Location of the Spilled Material

The spilled material drains from the drum onto the paved area and is effectively contained. Barriers are used to cover facility storm drains to prevent spilled material from entering the storm drains. Recovery operations would begin following an assessment of personnel safety.

Material Discharged

The material discharged is Low Sulfur Fuel Oil (Group 4, persistent oil), biofuel, lubricating oil or solvent.

Weather Conditions

The temperature is 85° F. Trade Winds are out of the northeast at 15 mph.

Available Remediation Equipment

HECO maintains an inventory of sorbent materials for the clean up of small spills. For a spill of this volume, it is probable that a contractor (e.g., PENCO) may be called upon to provide additional remediation equipment and assistance.

Probability of a Chain Reaction of Failures

A chain reaction of failures under this scenario is unlikely.

Direction of Spill Pathway

The spill occurs on a paved area and spreads horizontally until effectively contained by facility response personnel using sorbent materials maintained at the facility. The direction of flow follows the contour of the paved area but containment is provided quickly and efficiently.

Stilling Basin Release

A release occurs when a transformer or cooling water pump located in the stilling basin area leaks due to corrosion or failure. The incident occurs during normal business hours and detected by the operator during their hourly rounds. For the purpose of this scenario it is assumed that the entire contents (<55 gallons) of the transformer or pump is released.

Proximity to Downgradient Wells, Waterways and Drinking Water Intakes

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

[redacted]

Likelihood that the Discharge Will Travel Offsite

Due to location of drains in the area it is likely that if the transformer or pump released its entire volume of oil, the discharge would enter the cooling water system and be discharged into the ocean. Hourly rounds would detect smaller leaks prior before they enter the drains and significant leaks may be detected by operational failures of critical equipment.

Location of the Spilled Material

The spilled material drains from the transformer onto the paved area and is effectively contained. Barriers are used to cover facility storm drains to prevent spilled material from entering the storm drains. Recovery operations would begin following an assessment of personnel safety.

Material Discharged

The material discharged is mineral oil or lube oil.

Weather Conditions

The temperature is 85° F. Trade Winds are out of the northeast at 15 mph.

Available Remediation Equipment

HECO maintains an inventory of sorbent materials for the clean up of small spills. For a spill of this volume, it is probable that a contractor (PENCO) may be called upon to provide additional remediation equipment and assistance.

Probability of a Chain Reaction of Failures

A chain reaction of failures under this scenario is unlikely.

Direction of Spill Pathway

The spill occurs on a paved area and spreads horizontally until effectively contained by facility response personnel using sorbent materials maintained at the facility. The direction of flow follows the contour of the paved area but containment is provided quickly and efficiently.

Fueling Release

A small discharge occurs when an operator overfills a vehicle (forklift or pool car) during refueling. The incident occurs during normal business hours and is immediately detected by the operator during the fueling process. For the purpose of this scenario it is assumed that less than 55 gallons is spilled.

Proximity to Downgradient Wells, Waterways and Drinking Water Intakes

(b) (7)(F), (b) (3)
[redacted]

Likelihood that the Discharge Will Travel Offsite

Due to close supervision, the discharged material is contained within the boundaries of the facility. It is unlikely that spilled material from this scenario would travel offsite.

Location of the Spilled Material

The spilled material flows onto the paved area and is effectively contained. Barriers are used to cover facility storm drains to prevent spilled material from entering the storm drains. Recovery operations would begin following an assessment of personnel safety.

Material Discharged

The material discharged is unleaded gasoline or diesel.

Weather Conditions

The temperature is 85° F. Trade Winds are out of the northeast at 15 mph.

Available Remediation Equipment

HECO maintains an inventory of sorbent materials for the clean up of small spills. For a spill of this volume, it is probable that a contractor (PENCO) may be called upon to provide additional remediation equipment and assistance.

Probability of a Chain Reaction of Failures

A chain reaction of failures under this scenario is unlikely.

Direction of Spill Pathway

The spill occurs on a paved area and spreads horizontally until effectively contained by facility response personnel using sorbent materials maintained at the facility. The direction of flow follows the contour of the paved area but containment is provided quickly and efficiently.

3.8.2 Medium Spill Size of the Spill

Pipeline Release

A medium discharge for the Kahe Generating Station is a planning volume of less than 36,000 gallons, and occurs when piping in the vicinity of the switchyard ruptures. The incident occurs in the evening and is detected and shut down by operating personnel after approximately 10 minutes.

Proximity to Downgradient Wells, Waterways and Drinking Water Intakes

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

[redacted]

Likelihood that the Discharge Will Travel Offsite

A spill of this magnitude in the vicinity of the K5 and 6 switchyard would likely enter the facility storm drains and be discharged to the Discharge Structures. The material would likely be contained within the confines of the Discharge Structures.

Location of the Spilled Material

The oil is spilled from piping adjacent to the switchyard and spreads to underlying soil and the nearby paved areas.

Material Discharged

The material discharged is Low Sulfur Fuel Oil (LSFO) or biofuel, Group 4, persistent oil.

Weather Conditions

The temperature is 85° F. Trade Winds are out of the northeast at 15 mph.

Available Remediation Equipment

HECO maintains an inventory of sorbent materials for the clean up of small spills, as well as materials such as sand bags, plastic sheeting and plywood sheeting which can be used to cover storm drains and construct temporary berms for spill containment.

For a spill of this volume, it is likely that Clean Islands Council (CIC) and other OSROs would be called upon to provide additional manpower as well as containment and remediation equipment.

Probability of a Chain Reaction of Failures

A discharge of this magnitude is expected to be detected fairly rapidly. The unit receiving fuel oil from the affected piping may need to be shut down temporarily while repairs are made.

Direction of Spill Pathway

Under this scenario, fuel oil would flow over the ground surface and enter the facility storm drains. Storm drains from this area discharge to the Discharge Structures where spilled oil would be contained.

Loading/Unloading Release

A release occurs when the tanker truck delivering product ruptures. The incident occurs during normal business hours and is detected by operating personnel immediately. For the purpose of this scenario it is assumed that approximately 5000 gallons of oil is released.

Proximity to Downgradient Wells, Waterways and Drinking Water Intakes

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

[redacted]

Likelihood that the Discharge Will Travel Offsite

A spill of this magnitude near Unit 1 would likely enter the facility sump and trench system where it would be contained. A spill near the blackstart units would be contained by curbing and is unlikely to migrate offsite. Spills near Unit 3-6 may flow towards the facility stormdrains that discharge to the ocean but since there are stormdrain blocking mats located near each of these drains, facility personnel would likely seal the stormdrain before the oil flows into them.

Location of the Spilled Material

The oil is spilled from the tanker and onto paved areas and spreads to sumps, trenches, stormdrains or unpaved areas.

Material Discharged

The material discharged is lube oil or diesel.

Weather Conditions

The temperature is 85° F. Trade Winds are out of the northeast at 15 mph.

Available Remediation Equipment

HECO maintains an inventory of sorbent materials for the clean up of medium spills, as well as materials such as sand bags, plastic sheeting and plywood sheeting which can be used to cover storm drains and construct temporary berms for spill containment.

For a spill of this volume, it is likely that Clean Islands Council (CIC) and other OSROs would be called upon to provide additional manpower as well as containment and remediation equipment.

Probability of a Chain Reaction of Failures

A discharge of this magnitude is expected to be detected fairly rapidly and unlikely to cause a chain reaction.

Direction of Spill Pathway

Under this scenario, fuel oil would flow over the ground surface and enter the facility storm drains.

Station or Switchyard Transformer Release

A release occurs when a station or switchyard transformer ruptures. The incident occurs during normal business hours and is detected by operating personnel immediately. For the purpose of this scenario it is assumed that approximately 5000-10,000 gallons of oil is released.

Proximity to Downgradient Wells, Waterways and Drinking Water Intakes

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

[redacted]

Likelihood that the Discharge Will Travel Offsite

A spill of this magnitude from the station transformer would likely enter the facility oil/water separators where it would be contained. A release from the Unit 1-4 switchyard would probably infiltrate into the ground before migrating off-site. If a release were to migrate off-site, it would likely enter the stormdrain system that discharged to the north swale. Unless it is raining during the release, the oil would be contained either in the stormdrain system or behind the sand plug in the north swale. A release for the Unit 5-6 switchyard would also infiltrate into the ground before migrating off-site. For a release to migrate off-site it would have to enter a perforated drainage pipe, overfill a small drainage sump, flow down the driveway and enter a stormdrain that discharged to the cooling water outfall. Unless it is raining during the release, it is unlikely that any transformer release would migrate off-site.

Location of the Spilled Material

The oil is spilled from the transformer and onto sumps, trenches, unpaved areas or stormdrains.

Material Discharged

The material discharged is transformer oil (mineral oil).

Weather Conditions

The temperature is 85° F. Trade Winds are out of the northeast at 15 mph.

Available Remediation Equipment

HECO maintains an inventory of sorbent materials for the clean up of medium spills, as well as materials such as sand bags, plastic sheeting and plywood sheeting which can be used to cover storm drains and construct temporary berms for spill containment.

For a spill of this volume, it is likely that Clean Islands Council (CIC) and other OSROs would be called upon to provide additional manpower as well as containment and remediation equipment.

Probability of a Chain Reaction of Failures

A discharge of this magnitude is expected to be detected fairly rapidly and unlikely to cause a chain reaction.

Direction of Spill Pathway

Under this scenario, fuel oil would flow over the ground surface and enter the facility storm drains.

3.8.3 Worst Case Discharge Size of the Spill

(b) (7)(F), (b) (3) [redacted] This represents the volume of the largest single tank (Tank 13) at the facility plus the combined capacity of the tanks lacking adequate secondary containment (all the tanks at the facility have adequate containment). While it is extremely unlikely that a tank failure resulting in the loss of the entire storage capacity would occur, HECO recognizes this procedure as a planning tool. The failure of secondary containment is also unlikely and secondary containment drain valves are sealed to prevent unauthorized draining.

This spill scenario occurs during the evening hours, and adverse weather conditions. The tank and associated secondary containment fail simultaneously

Proximity to Downgradient Wells, Waterways and Drinking Water Intakes

(b) (7)(F), (b) (3) [redacted]

Likelihood that the Discharge Will Travel Offsite

This scenario assumes simultaneous failure of the tank and associated secondary containment.

A discharge of this volume would almost certainly travel offsite. It is anticipated that spilled oil under this scenario would flow across the ground surface and enter the facility storm drains. It is possible that spilled oil would also enter the swale to the north of the facility. Surface water discharge from the swale is normally restrained by a sand plug at the mouth of the swale. During periods of heavy rain however, the sand plug can breach and surface water from the swale will discharge to the Pacific Ocean.

Location of the Spilled Material

The spill originates from Tank 13 and the associated secondary containment. Tank 13 is located in the northeastern portion of the Plant.

Material Discharged

The material discharged is Low Sulfur Fuel Oil (LSFO) or biofuel, Group 4, persistent oil.

Weather Conditions

The temperature is 80° F. Kona (storm) Winds are out of the south at 25 - 30 mph.

Available Remediation Equipment

A spill of this magnitude would initiate immediate notification of Clean Islands Council (CIC) and their support contractors as well as NRC Environmental for containment and cleanup. A listing of equipment available through CIC and other OSROs is provided in Section 3.6.

Probability of a Chain Reaction of Failures

There is a potential for subsequent shutdown of generators following an event of this nature at the Kahe Generating Station. However, the entire plant may not need to be shut down as a result of this type of spill. The plant's intake structures would require immediate protection, but under adverse weather conditions with winds from the south, the slick would likely move in a northerly direction, away from the intake structures.

Direction of Spill Pathway

The spilled fuel oil would likely flow over the ground surface following drainage patterns, and be discharged into the swale north of the facility as well as into the facility storm drains. Assuming that the sand plug at the mouth of the swale were breached, spilled oil would flow downstream with the current and eventually into the Pacific Ocean. Upon entering the ocean, the oil will spread on the water's surface and be influenced by the effects of wind and tide until contained. Because this scenario considers adverse weather conditions, Kona, or storm winds from the south would tend to move the slick in a northerly direction. The slick is anticipated to move north along the coast as far as Kaena Point (approximately 20 miles) before moving out to sea.

Calculation of the Worst Case Discharge (WCD) Planning Volume

The following calculations are based on Part A, Appendix D, 40 CFR Part 112. The Kahe Generating Station is a multiple tank facility. There are no tanks which are permanently manifolded together. (b) (7)(F), (b) (3) [redacted]

The planning worksheet is presented in Table 3.8-1.

Daily Recovery Rates

(b) (7)(F), (b) (3) [redacted]s. Additional information on CIC, NRC Environmental, and other OSROs is listed in Section 3.6.

Additional resources, not under contract, can be obtained from MSRC in Honolulu.

Inventory of Equipment

Based on the equipment available from CIC and NRC Environmental, and other OSROs under contract, the Kahe Generating Station has sufficient containment boom and on-water recovery capability to meet the daily Response Capability Caps. A listing of CIC's and other contract OSRO's equipment is provided in Section 3.6. This equipment is appropriate for the geographic area and type of oil handled.

Additional response resources are identified in the Hawaiian Area Contingency Plan (HACP).

Table 3.8-1
Worksheet to Plan Volume of Response Resources for EPA Worst Case Discharge (WCD): Group 4 Oil

PART I BACKGROUND INFORMATION

Step (A) Calculate WCD: [redacted] (based on largest Group 4 oil storage tank; none of the tanks are permanently manifolded together; all tanks have adequate secondary containment)

Step (B) Oil Group: **Group 4 (LSFO or biofuel)**

Step (C) Operating Area: **Nearshore**

Step (D) Percentages of Oil:

(D1) Lost to Natural Dissipation: [redacted]

(D2) Recovered Floating Oil:

(D3) Oil Onshore

Step (E1) On-Water Oil Recovery [Step (A) x (D2)] [redacted]

Step (E2) Shoreline Recovery [Step (A) x (D3)]

Step (F) Emulsification Factor [redacted]

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

(G1) - Tier 1	(G2) - Tier 2	(G3) - Tier 3
0.15	**0.25**	**0.40**

Part II On-Water Oil Recovery Capacity (barrels/day) [Step (E1) x (F) x (G)]

Tier 1	Tier 2	Tier 3
[redacted]		

Part III Shoreline Cleanup Volume [Step (E2) x (F)] [redacted]

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

Tier 1	Tier 2	Tier 3
12,500	**25,000**	**50,000**

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
2,982 bbls	**803 bbls**	**NA**

APPENDIX A

SITE HEALTH AND SAFETY PLAN

THIS PAGE INTENTIONALLY LEFT BLANK

Section 2200 - Health and Safety

This Section provides guidance in the preparation of a proper Site Safety and Health Plan, and the protecting of personnel from serious risks to their physical safety and health while responding to a marine discharge.

Responder Training

Responders may be called upon to fulfill a variety of roles under changing conditions during a response. Some of these roles will involve working on vessels at or nearby the source or the spill, while others will be concerned primarily with longer-term shoreline cleanup operations. Additional personnel could be involved in "defensive-type" preparatory activities on the shoreline following a marine oil spill but prior to the actual deposition of oil on that section of the coast.

Many of these roles have different training needs. Appropriate response strategies are also required under changing conditions to safeguard the health and safety of personnel while responding quickly and effectively to limit the impact of the spill on the environment.

The cleanup of a spill or discharge should always be undertaken by personnel trained as Hazardous Materials Technicians in accordance with 29 Code of Federal Regulations (CFR) 1910.120. This operational phase of the response is often characterized by changing conditions at and near the spill site. Accordingly, these oil spill responders are trained to recognize and monitor hazard conditions and implement standard operating procedures and response strategies to protect themselves while effectively responding to the emergency. A short-form Site Safety and Health Plan (typically a pre-formatted document only a few pages in length) is appropriate should the response extend beyond a single shift.

The operational phase of a response frequently requires substantial numbers of personnel but is characterized by limited, stable and readily identifiable hazard conditions. In such conditions, where the site has been fully characterized and a detailed Site Safety and Health Plan prepared by a qualified person approved by the On-Scene Coordinator, it is not usually necessary that all personnel involved have prior training to the Hazardous Materials Technician level. Instead, this category of responder must receive specific safety and health training for the hazards and control measures identified in the Site Safety and Health Plan, together with the job skills and procedures appropriate to their role in the cleanup operations.

This Section recognizes that the safety and health training needs for some of those categories of personnel extend beyond that which might be narrowly defined as "hazardous materials handling." It also recognizes that some aspects of 29 CFR 1910.120 "Hazardous Waste Operations and Emergency Response" (and its counterpart in the State of Hawaii, HAR Chap. 12-99) are imprecise in relation to marine oil spills, and thus open to interpretation from time to time in specific situations.

All training records should reflect that OSHA/State of Hawaii Department of Labor, Occupational Safety and Health Division (HIOSH) requirements have been satisfied. Contractors are responsible for certifying the training of their employees.

Volunteer Training

This Section also recognizes that public-interest volunteers and special interest groups will frequently seek to contribute to, and be actively involved in, mitigating the adverse effects on the environment. While in a strict legal sense the provisions of 29 CFR 1910.120 may not in general apply to such volunteers, there is a responsibility for the Safety and Health Training Plan to address such personnel as well.

Accordingly, this Section is guided by the fundamental objective of the Occupational Safety Health Act of 1970 (OSHA) and subordinate regulations - to protect "workers" from unreasonable risks to their physical safety and health in the performance of their duties. This plan provides a practical and thus achievable means of providing such training for each of the multiple categories of personnel identified, recognizing the unique circumstances which can exist immediately following a significant discharge of oil or hazardous materials.

OSHA has recognized the need to remove oil from the environment and has empowered the OSHA Regional Response Team (RRT) representative to reduce the training requirement for certain post emergency response workers to four hours, as referenced in the De Minimis criterion of OSHA instruction CPL 2-2.51. Such reduced training requirements apply to all Coast Guard personnel and private workers, particularly in shoreline cleanup operations.

The Area Committee has determined that pre-spill training of prospective volunteers with the four-hour course will greatly benefit any oil spill response effort. This includes shoreline cleanup operations. The reduced training applies to all Coast Guard personnel and private workers. This information is referenced in the De Minimus Criteria of OSHA instruction CPL 2-2.51. The level of training depends on the risk of exposure. It is important to fully characterize the spill site and determine the health and safety risks before determining the required level of training. This is to be conducted by a qualified person as approved by the On-Scene Coordinator.

See Section 2420 Volunteer Program

Site Control

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

[redacted]

Site Safety

The role of the safety officer is to assess the site, determine the safety and health hazards present, and determine if OSHA regulations apply. If an OSHA field compliance officer is on scene, they should be consulted to determine the applicability of OSHA regulations.

The individual making the site characterization should communicate the hazards associated with the spill, and provide recommendations for the protection of workers' health and safety through a Site Safety and Health Plan.

The responsibility for the health and safety of personnel supporting a pollution response mission rests with the On-Scene Coordinator.

Training Requirements

This section specifies the level of training required for response workers (grouped by category) potentially involved in response activities, Section 2210 contains recommended curriculum outlines.

Direct Beach Cleaning Operations

Permanent employees of oil spill response contractor....................................24 hrs

Permanent employees of operating (oil) companies' HAZMAT teams including the PRP (Potential Responsible Party) .... 24 hrs

Supervisory and managerial staff of oil spill response contractors.. 40 + 8 hrs

Supervisory and managerial staff of operating oil companies including the PRP .... 40 + 8 hrs *

Team members from oil spill response cooperatives......................... 40 + 8 hrs *
....24 hrs #

Operators of contracted heavy equipment (tractors, graders, etc.) .... 4 hrs @

Casual day labor force ....4 hrs

Any of the above required to distribute biological agents ....24 hrs

On-scene Incident Commander..24 hrs

Federal Response Personnel (EPA, FWS, NOAA, USCG)..........................40 hrs

Offshore Cleaning Operations

Employees involved in direct cleaning operations ....24 hrs

Vessel crewmembers not involved with direct cleanup............................4 hrs @

Any of the above required to perform dispersant spraying...........................24 hrs

Beach-Cleaning Support Services

Perimeter Security personnel (police or contractors).. Nil

Heavy transport drivers
(i.e., removal of contaminated sand, etc.).. Nil

Paramedics at site EMT post.
(Municipal, commercial operators or first-aid volunteers)........................ Nil

Site refreshment services (food and drink)
(Could be commercial operators or nonprofit agencies) .... Nil

Workers at staging areas handling heavy loads with forklifts and cranes. (Loading and unloading of vessels and over the road trucks) .... 4 hrs

Shoreline Assessment Cleanup

SCAT Course .... 1 day

Field Experience .... 1-2 days

Specialist Services

Industrial hygienists for site characterization and monitoring. .... 24 hrs

Public Interest Volunteers

Wildlife rescue and recovery (Both on the beach and in the water - wading and in small boats.) .... 4 hrs

Wildlife cleaning at staging areas outside the "hot zone" .... 4 hrs

Beach cleanup (especially the cleaning of oil-affected stones, etc.) .... 4 hrs

Visitors to the "Hot Zone"

Other USCG staff .... **

PRP senior management (not involved in supervising on site operations) .... Awareness

Politicians .... Awareness

Specialist professional staff from public agencies (e.g., government monitoring of activities, Publics Affairs, Media) .... 24 hrs

Specialist professional staff from independent consultants. .... 24 hrs

Representatives of special interest groups .... Awareness

Notes:

*   If engaged in supervising the cleanup operation on site.

If performing cleanup operation (direct from supervising those operations).

@   Refer to 29 CFR 1910.120(q)(4), Safety and Health criteria.

** USCG personnel should have received awareness level of training.

Personal Protective Equipment and Heat Stress

Besides training and development of a Site Safety and Health Plan, appropriate selection and use of Personal Protective Equipment (PPE) is essential for worker safety. An appropriate reference must be used to determine the appropriate PPE required for each response. For oil spill situations requiring worker respiratory protection, full compliance with 29 CFR 1910 is required.

The Site Safety and Health Supervisor shall generally be guided by the American Conference of Governmental Industrial Hygienists Guidelines in determining work/rest periods, heat stress reduction strategies, and fluid intake. It is recognized by the Committee that Personal Protective Equipment (PPE) suitable to protect a worker from being exposed to either oil or chemicals, by design, will restrict the body's natural ability to control its core temperature. Wearing full PPE in a hot and humid work environment will cause heat stress. To effectively deal with heat stress issues requires a comprehensive approach that includes full understanding and implementation of all heat stress reduction strategies. These measures include but are not limited to the following.

- Proper application of a program to supply water to site workers in a controlled manner that prevents ingestion of oil or chemicals but, supplies adequate quantities to satisfy OSHA standards.
- Measures to insure that workers are in good health and can withstand the normal levels of heat stress that may be required of certain tasks.
- Work/Rest periods that consider temperature, humidity, acclimatization, wind, and required PPE must be made.
- Proper selection of PPE to minimize heat stress while still protecting the site worker from oil exposure as needed.

These Heat Stress reduction measures should be fully outlined in the Site Safety and Health Plan.

Additional specific heat stress reduction strategies may be mandated by the Site Safety and Health Supervisor and should be included in the Site Safety and Health Plan.

References

The following references are useful for the development of site safety and health plans:]

- OSHA 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response
- National Institute for Occupational Safety and Health (NIOSH), Occupational Safety
- Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), Environmental Protection Agency (EPA), Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985)(USCG)
- Memorandum of understanding (NIOSH), (OSHA), (EPA), Guidance for Worker Protection During Hazardous Waste Site Investigations and Cleanup and Hazardous Substances
- EPA, Field Standard Operating Procedure, Decontamination of Response Personnel, Publication No. 7, (1984); Preparation of A Site Safety Plan, Publication No. 9 (1984); Standard Operating Safety Guidelines, (1988); Hazardous Materials Emergency Planning Guide, (1987)
- U.S. Department of Health and Human Services (DHHS), Personal Protective Equipment for Hazardous Material Incidents: A Selection Guide, (1984); Pocket Guide to Chemical Hazards, PUB No. 90-117 (1990)
- American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values and Biological Exposure Indices
- U.S. Department of Transportation (DOT) Emergency Response Guidebook
- Chemical Manufactures Association (DOT), Site Emergency Response Training (1986)
- National Fire Protection Association (NFPA), Standard 471- Recommended Practice For Responding to Hazardous Materials Incidents
- National Fire Protection Association (NFPA), Standard 472, Standard for Professional Competence of Response to Hazardous Material Incidents
- Training Reference For Oil Spill Response (Joint document approved by DOT, EPA and Department of the Interior; published by (USCG), (1994)

Note: Information on the above topics can be obtained through the Coast Guard's appointed site safety and health officer.

This Page Intentionally Blank

Site Safety and Health Plan

Incident Name: ______	Operational Period
Location: ______	From: Date: ______ Time: ______
Group/Division ______	To: Date: ______ Time: ______

This is a ☐ New Plan ☐ Revised Plan

On-Scene Commander

Name *company/organization* *phone/radio* *operational area*

Site Safety Officer

Name *company/organization* *phone/radio* *operational area*

Site Operating Companies

Company name *Field supervisor* *phone/radio* *operational area*

Description of Site ______

Locations of Site ______

Description of Surrounding Area ______

Description of Surrounding Population ______

Health and PPE Requirement *(matrix on reverse side)*

☐ Outer Gloves	☐ Face Shield	☐ Site Characterization	☐ Prework Medical	☐ Zone Control
☐ Inner Gloves	☐ Sun Hat	☐ Air Purifying Resp.	☐ 40 Hr. HAZWOPER	☐ Security
☐ Rubber Boots	☐ Sun tan Lotion	☐ Supplied Air Resp.	☐ 24 Hr. HAZWOPER	☐ C/S Ent. Permit
☐ 2/3 Body Cover	☐ Taped Leg Joints	☐ Safety Glasses	☐ First Aid Station	☐ Personnel Decon
☐ Full Body Cover	☐ Hard Hat	☐ Heat Stress Program	☐ Shade Station	☐ USCG Life Vest

Personal Protective Equipment and Heat Stress

Besides training and development of a Site Safety and Health Plan, appropriate selection and wearing of Personal Protective Equipment (PPE) is essential for worker safety. The following matrix is provided to assist the Site Safety Supervisor in using his hazard analysis to determine appropriate PPE and work procedures. No attempt is made to address respiratory protection; normally oil spills do not require use of a respirator.

	SHORELINE								VESSEL					
PPE Decision Matrix **KEY** **R = Required** **S = Suggested**	Sun Exposure	HI Heat Stress Redux	Non Splashing Oil	Splashing Oil	LO Energy Surf Zone	HI Energy Surf Zone	Crane / Rigging Work		Sun Exposure	HI Heat Stress Redux	Non Splashing Oil	Splashing Oil	Working on Vessel	Crane/Rigging Work
High Gauntlet Gloves			R	R		R	R				R	R		
Inner Gloves			S	S		S	S				S	S		
Sun Hat	R		R	R		R	R		R		R	R		
Sun Screen	R		R	R		R	R		R		R	R		
Sun Glasses	S		S	S		S	S		S		S	S		
Rubber Boots			R	R		R	R				R	R		
Saranex/Vinyl Coverall Bottom			R	R		R	R				R	R		
Saranex / Vinyl Jacket				R								R		
Steel Toe Shoes							S							S
Goggles or Face Shield				R								R		
Work Vest Type PFD					R		R					R	R	
Hard Hat							R							R
HEAT STRESS PLAN IN THE CAN														
The automatic Heat Stress Reduction Program														
to be implemented when people wear PPE														
2/3's PPE Coverage *		R	R							R	R			
Cold Water Always Available		R								R				
Shade Stations		R								R				
Sun Protection		R								R				
Bathroom Facilities		S								S				

* 2/3's PPE Coverage would be as shown in the shaded column.

Personal Protective Equipment and Heat Stress Reduction

Site Safety Supervisors need to review the Site Safety and Health Plan with concern for heat stress reduction considerations. The Hawaii Area Planning Committee, Worker Health and Safety Subcommittee, has recommended that, in the absence of splashing oil, a 2/3 PPE configuration should be worn. In addition, the moment personnel are required to wear PPE as recommended under the matrix, an automatick Heat Reduction Program shall be implemented. This program is called the **Heat Stress Plan in the Can**. It is described in the bottom section of the matrix and essentially includes 2/3 PPE, cold water always available, shade stations, sun protection and bathroom facilities as soon as possible. It is the intention of the committee that these minimum basic heat stress reduction measures be automatically implemented whenever personnel begin to wear protective covering. Personal water bottles have been approved for use within the hot zone given they need not be opened by an individual with oily hands.

Potential Heat Stress Factors

The provided matrix assumes a normal Ahawaii work force under normal circumstances. Site Safety Supervisors should consider additional heat stress reduction control measures if extraordinary Heat Stress Factors exist. The Worker Health and Safety Subcommittee has identified a number of factors that should be considered when revi3ewing a given heat stress reduction program. These include but are not limited to the following.

- Unknown contracted work force.
- Unacclimated work force.
- Unusually not weather.
- Character of the work load.
- Longer distances from support.
- Duration of the work shift.

Heat Stress Factors such as these may require the use of additional Heat Stress Control Tools to ensure the heat stress reduction program adequately protects the work force during extraordinary circumstances.

Potential Additional Heat Stress Control Tools

If additional Heat Stress Factors indicate that the heat stress reduction program needs to be enhanced, listed below are some additional Heat Stress Control Tools that may be beneficial. They are not listed by priority, rather, any or all of them may be beneficial under varying circumstances.

- Personal water bottles.
- Work break periods.
- First aid/EMT water intake and heat stress monitoring.
- Wet and Dry Bulb humidity and temperature monitoring.
- Cool water pump srayer teams for cooling hats
- Risk specific "Heat Stress" safety meetings.
- Cooling vests, hats or kerchiefs.
- Cool zone fans.

Operational Objectives

Site Control

Site Control Description

Site Control Map (Reference Sketch)

Site Security

Requirements

Site Characterization and Monitoring

Exposure Potential:

Required Characterization Testing:

Exposure Limits:

Reading for LEL (Lower Explosive Limit) must be less than 10%

Reading for H2S must be less than 10 PPM

Reading for Benzene (TBX) must be less than 1 PPM

Required Monitoring:

Field Site Characterization Checklist

Date:	Time:
Location:	
Type of Petroleum Involved:	

Personal Protection Equipment

☐ Outer Gloves	☐ Face Shield	☐ Site Characterization	☐ Prework Medical	☐ Zone Control
☐ Inner Gloves	☐ Sun Hat	☐ Air Purifying Resp.	☐ 40 Hr. HAZWOPER	☐ Security
☐ Rubber Boots	☐ Sun tan Lotion	☐ Supplied Air Resp.	☐ 24 Hr. HAZWOPER	☐ C/S Ent. Permit
☐ 2/3 Body Cover	☐ Taped Leg Joints	☐ Safety Glasses	☐ First Aid Station	☐ Personnel Decon
☐ Full Body Cover	☐ Hard Hat	☐ Heat Stress Program	☐ Shade Station	☐ USCG Life Vest

Monitoring Equipment

Lower Exposure Limit (LEL)

LEL =

Hydrogen Sulfide (H2S)

H_2S =

Benzene (TBX)

PPM =

Near Site Emergency Response resources
When a person is injured, the Site Safety Officer or other qualified personnel must ...
Standard Procedures for Reporting Emergencies
When calling for assistance in an emergency, provide the following information …
Ambulance
Fire Department
Oil Spill Response
Hospital / Emergency Medical
Hazard Reduction Procedures

Thermal Stress Reduction Program	
Operational Requirements:	
Contacts List	
Important numbers:	
Notification and Distribution	
Who should receive a copy of this plan:	
Plan Approvals	
Plan Prepared by	*Date*
Responsible Party's Representative	*Date*
U.S. coast guard's Representative	*Date*
State of Hawaii's Representative	*Date*

This Page Intentionally Blank

APPENDIX B

MATERIAL SAFETY DATA SHEETS

THIS PAGE INTENTIONALLY LEFT BLANK

Material Safety Data Sheet

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

CHEVRON LSFO 0.5 S

PRODUCT NUMBER(S): CPS283150

COMPANY IDENTIFICATION

Chevron USA Products Company
Environmental, Safety, and Health
Room 2900
575 Market St.
San Francisco, CA 94105-2856

EMERGENCY TELEPHONE NUMBERS

HEALTH (24 hr): (800)231-0623 or (510)231-0623 (International)
TRANSPORTATION (24 hr): CHEMTREC (800)424-9300 or (202)483-7616

PRODUCT INFORMATION: MSDS Requests: (415) 894-8855
Environmental, Safety, & Health Info: (415) 894-1899
Product Information: (510) 242-2736

2. COMPOSITION/INFORMATION ON INGREDIENTS

100.0 % CHEVRON LSFO 0.5 S

CONTAINING

COMPONENTS	AMOUNT	LIMIT/QTY	AGENCY/TYPE
FUEL OIL, NO. 6 Chemical Name: FUEL OIL, NO. 6 CAS68553004	100.0%	NONE	NA
INCLUDING			
CAT CRACKED CLARIFIED OIL Chemical Name: CLARIFIED OILS, CATALYTIC CRACKED CAS64741624		NONE	NA

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	PEL - Permissible Exposure Limit
C - Ceiling Limit	CAS - Chemical Abstract Service Number
A1-5 - Appendix A Categories	() - Change Has Been Proposed

3. HAZARDS IDENTIFICATION

************************* **EMERGENCY OVERVIEW** *************************

Black liquid.

- **COMBUSTIBLE**
- **HEATING MAY RELEASE HIGHLY TOXIC AND FLAMMABLE HYDROGEN SULFIDE (H2S) GAS**
- **CANCER SUSPECT AGENT**
- **PROLONGED OR REPEATED SKIN CONTACT MAY INCREASE THE RISK OF SKIN CANCER**

****

POTENTIAL HEALTH EFFECTS

EYE:
This substance is not expected to cause prolonged or significant eye irritation. This hazard evaluation is based on the data from similar materials.

SKIN:
Expected to cause no more than minor skin irritation, but prolonged or frequently repeated skin contact may be harmful. If absorbed through the skin, this substance is considered practically non-toxic to internal organs. This hazard evaluation is based on data from similar materials.

INGESTION:
If swallowed, this substance is considered practically non-toxic to internal organs. This hazard evaluation is based on data from similar materials.

INHALATION:
Prolonged breathing of vapors can cause central nervous system effects. This substance contains sulfur compounds which may form hydrogen sulfide. The rotten eggs odor of hydrogen sulfide is unreliable as an indicator of concentration. The U.S. Occupational Safety and Health Administration (OSHA) considers an atmophere containing concentrations of H2S greater than 100 ppm to be Immediately Dangerous to Life and Health (IDLH). This hazard evaluation is based on data from similar materials.

SIGNS AND SYMPTOMS OF EXPOSURE:
INHALATION: Central nervous system effects may include one or more of following: headache, dizziness, loss of appetite, weakness and loss of coordination.

CARCINOGENICITY:
This product contains a mixture of petroleum hydrocarbons called middle distillates (which means they boil between approximately 350F and 700F). Because of this broad description, many products are considered middle distillates yet they are produced by a variety of different petroleum refining processes. Toxicology data developed on some middle distillates found that they caused positive responses in some mutagenicity tests and caused skin cancer when repeatedly applied to mice over their lifetime. This product may contain some middle distillates found to cause those adverse effects.

This product may contain significant amounts of polynuclear aromatic hydrocarbons (PAH's) which have been shown to cause skin cancer after prolonged and frequent contact with the skin of test animals. Brief or intermittent skin contact with this product is not expected to have serious effects if it is washed from the skin. While skin cancer is unlikely to occur in human beings following use of this product, skin contact and breathing of mists or vapors should be reduced to a minimum.

4. FIRST AID MEASURES

EYE:
No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.
SKIN:
Remove contaminated clothing. Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this document occur. Discard contaminated non-waterproof shoes and boots. Wash contaminated clothing.
INGESTION:
If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.
INHALATION:
If any signs or symptoms as described in this document occur, move the person to fresh air. If any of these effects continue, see a doctor. If there are signs or symptoms as described in this document due to breathing hydrogen sulfide, move the person to fresh air. If breathing has stopped, apply artificial respiration. Call a doctor.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:
FLASH POINT: (P-M) 180F (82C) Min.
AUTOIGNITION: NDA
FLAMMABILITY LIMITS (% by volume in air): Lower: NDA Upper: NDA
EXTINGUISHING MEDIA:

CO2, dry chemical, foam and water fog.

NFPA RATINGS: Health 0; Flammability 2; Reactivity 0.

FIRE FIGHTING INSTRUCTIONS:

Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85 F.

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

COMBUSTION PRODUCTS:

Normal combustion forms carbon dioxide, water vapor and may produce oxides of sulfur. Incomplete combustion can produce carbon monoxide.

---

6. ACCIDENTAL RELEASE MEASURES

CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (202)483-7616

ACCIDENTAL RELEASE MEASURES:

Eliminate all sources of ignition in vicinity of spill or released vapor.

Clean up spills immediately, observing precautions in Exposure Controls/ Personal Protection section. This material is considered to be a water pollutant and releases of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems.

U.S.A. regulations require reporting spills of this material that could reach any surface waters. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

---

7. HANDLING AND STORAGE

DO NOT USE OR STORE near flame, sparks or hot surfaces. USE ONLY IN WELL VENTILATED AREA. Keep container closed. DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

Toxic quantities of hydrogen sulfide (H2S) may be present in storage tanks and bulk transport vessels which contain or have contained this material. Persons opening or entering these compartments should first determine if H2S is present. See Exposure Controls/Personal Protection section. DO NOT ATTEMPT RESCUE WITHOUT WEARING APPROVED SUPPLIED-AIR OR self-contained breathing equipment.

---

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS
Use this material only in well ventilated areas.

PERSONAL PROTECTIVE EQUIPMENT
EYE/FACE PROTECTION:
No special eye protection is usually necessary.
SKIN PROTECTION:
Avoid contact with skin or clothing. Skin contact should be minimized by wearing protective clothing including gloves.
RESPIRATORY PROTECTION:
No special respiratory protection is normally required. However, if operating conditions create high airborne concentrations, the use of an approved respirator is recommended. Note: If any of the applicable hydrogen sulfide standards are likely to be exceeded, positive supplied-air respiratory protection must be used. The ACGIH TWA for hydrogen sulfide is 10 ppm. The OSHA STEL is 15ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION:
Black liquid.

pH:	NDA
VAPOR PRESSURE:	NDA
VAPOR DENSITY (AIR=1):	NDA
BOILING POINT:	NDA
FREEZING POINT:	NDA
MELTING POINT:	NA
SOLUBILITY:	Soluble in hydrocarbon solvents; insoluble in water.
SPECIFIC GRAVITY:	0.99 @ 15.6/15.6C (Min.)
VISCOSITY:	5.6 cSt @ 100C (Min.)

10. STABILITY AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
Heating this material may produce hydrogen sulfide.
CHEMICAL STABILITY:
Stable.
CONDITIONS TO AVOID:
No data available.
INCOMPATIBILITY WITH OTHER MATERIALS:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:
The Draize Eye Irritation Score (range, 0-110) in rabbits is 4.0-7.3/110.
SKIN EFFECTS:
The dermal LD50 in rabbits is greater than 5 ml/kg. The Draize Skin Primary Irritation Score (range 0-8) for a 4-hour exposure (rabbits) is 0.2-1.5.
ACUTE ORAL EFFECTS:
The oral LD50 in rats is greater than 5 ml/kg.
ACUTE INHALATION EFFECTS:
No product toxicology data available. The hazard evaluation was based on data from similar materials.
CHRONIC EFFECTS/CARCINOGENICITY:
Residual (heavy) fuel oils were reviewed by the International Agency for Research on Cancer (IARC) in their Monograph Volume 45 (1989). Evidence for causing cancer was considered inadequate in humans and sufficient in animals. IARC placed this material in Category 2B, considering it possibly carcinogenic to humans.

This material contains the high-boiling fraction of catalytically cracked oils. The International Agency for Research on Cancer (IARC) in Monograph 33 (1984) and Supplement 7 (1987) included these oils in their definition of Untreated and Mildly-Treated Oils. IARC considers these oils to be Group 1, or human, carcinogens.

This material contains Cat Cracked Clarified Oil. Tests have shown it to cause skin cancer, liver and thymus damage, anemia, fetal death and birth defects in laboratory animals. These effects were observed after prolonged and repeated skin contact. It must be assumed that these effects could also occur in humans after prolonged or repeated skin contact, therefore, appropriate skin protection is essential when handling this material.

ADDITIONAL TOXICOLOGY INFORMATION:
The data above is obtained from studies sponsored by the American Petroleum Institute (API).

---

12. ECOLOGICAL INFORMATION

ECOTOXICITY:
The 96-hour LC50 in Atlantic silverside (Menidia menidia) is 130 mg/l.
The 96-hour EC50 in diatom (Skeletonema costatum) is 160 mg/l.
ENVIRONMENTAL FATE:
No data available.

---

13. DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by USEPA under RCRA (40CFR261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

14. TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT SHIPPING NAME: GAS OIL
DOT HAZARD CLASS: COMBUSTIBLE LIQUID
DOT IDENTIFICATION NUMBER: UN1202
DOT PACKING GROUP: III

15. REGULATORY INFORMATION

SARA 311 CATEGORIES:	1.	Immediate (Acute) Health Effects:	YES
	2.	Delayed (Chronic) Health Effects:	YES
	3.	Fire Hazard:	YES
	4.	Sudden Release of Pressure Hazard:	NO
	5.	Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01=SARA 313	11=NJ RTK	22=TSCA Sect 5(a)(2)
02=MASS RTK	12=CERCLA 302.4	23=TSCA Sect 6
03=NTP Carcinogen	13=MN RTK	24=TSCA Sect 12(b)
04=CA Prop 65-Carcin	14=ACGIH TWA	25=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	26=TSCA Sect 8(d)
06=IARC Group 1	16=ACGIH Calc TLV	27=TSCA Sect 4(a)
07=IARC Group 2A	17=OSHA PEL	28=Canadian WHMIS
08=IARC Group 2B	18=DOT Marine Pollutant	29=OSHA CEILING
09=SARA 302/304	19=Chevron TWA	30=Chevron STEL
10=PA RTK	20=EPA Carcinogen	

The following components of this material are found on the regulatory lists indicated.

CLARIFIED OILS, CATALYTIC CRACKED
  is found on lists: 06,
FUEL OIL, NO. 6
  is found on lists: 08,

16. OTHER INFORMATION

NFPA RATINGS: Health 0; Flammability 2; Reactivity 0;
(Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT:
This revision updates Section 3 (Hazards Identification).

****

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Material Safety Data Sheet

- Click on the product name to go to the Salesfax description sheet.
- Click on the grade to go to the Salesfax typical test data sheet.

Chevron LS Diesel 2 (only grade)

MSDS: 5556 **Revision #:** 7 **Revision Date:** 06/03/95

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

CHEVRON LS DIESEL 2

PRODUCT NUMBER(S): CPS270005 CPS271006 CPS272093 CPS272125
CPS272593 CPS272693 CPS272793 CPS272893

COMPANY IDENTIFICATION

CHEVRON USA PRODUCTS COMPANY
ENVIRONMENTAL, SAFETY, AND HEALTH
ROOM 2900
575 MARKET ST.
SAN FRANCISCO, CA 94105-2856

EMERGENCY TELEPHONE NUMBERS

HEALTH (24 hr): (800)231-0623 or
(510)231-0623 (International)
TRANSPORTATION (24 hr): CHEMTREC
(800)424-9300 or (202)483-7616

PRODUCT INFORMATION: MSDS REQUEST: (415) 894-2783
ENVIRONMENTAL, SAFETY & HEALTH INFO.: (415) 894-1899
Product Information: (510) 242-5357

---

2. COMPOSITION/INFORMATION ON INGREDIENTS

100.0 % CHEVRON LS DIESEL 2

CONTAINING

COMPONENTS	AMOUNT	LIMIT/QTY	AGENCY/TYPE
DIESEL FUEL NO. 2			
Chemical Name: FUELS, DIESEL, NO. 2			
CAS68476346	100.0%	NONE	NA
INCLUDING			
HDS DISTILLATE, MIDDLE			
Chemical Name: DISTILLATES, HYDRODESULFURIZED MIDDLE			
CAS64742809		NONE	NA
GAS OIL, LIGHT			
Chemical Name: DISTILLATES, STRAIGHT RUN MIDDLE			
CAS64741442		NONE	NA
KEROSENE			
Chemical Name: KEROSINE			
CAS8008206		NONE	NA

HYDRODESULFURIZED KEROSINE

Chemical Name: KEROSINE, HYDRODESULFURIZED

CAS64742810	NONE	NA

CAT CRACKED DISTILLATE, LIGHT

Chemical Name: DISTILLATES, LIGHT CATALYTIC CRACKED

CAS64741599	NONE	NA

TOTAL SULFUR

<500.0PPM

COMPOSITION COMMENT:

All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	PEL - Permissible Exposure Limit
C - Ceiling Limit	CAS - Chemical Abstract Service Number
A1-5 - Appendix A Categories	() - Change Has Been Proposed

---

3. HAZARDS IDENTIFICATION

************************ EMERGENCY OVERVIEW ************************

Pale yellow liquid.

- COMBUSTIBLE
- HARMFUL OR FATAL IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE
- CAUSES SKIN IRRITATION
- MAY CAUSE CANCER BASED ON ANIMAL DATA

****

POTENTIAL HEALTH EFFECTS

EYE:

This substance is not expected to cause prolonged or significant eye irritation.

SKIN:

This substance is a moderate skin irritant so contact with the skin could cause prolonged (days) injury to the affected area. The degree of injury will depend on the amount of material that gets on the skin and the speed and thoroughness of the first aid treatment. If absorbed through the skin, this substance is considered practically non-toxic to internal organs.

INGESTION:

If swallowed, this substance is considered practically non-toxic to internal organs. Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause severe injury to the lungs and death.

INHALATION:

Prolonged breathing of vapors can cause central nervous system effects. This hazard evaluation is based on data from similar materials.

SIGNS AND SYMPTOMS OF EXPOSURE:

INHALATION: Central nervous system effects may include one or more of following: headache, dizziness, loss of appetite, weakness and loss of coordination. SKIN: May include pain or a feeling of heat, discoloration, swelling, and blistering.

CARCINOGENICITY:

This product contains a mixture of petroleum hydrocarbons called middle distillates (which means they boil between approximately 350F and 700F). Because of this broad description, many products are considered middle distillates yet they are produced by a variety of different petroleum refining processes. Toxicology data developed on some middle distillates found that they caused positive responses in some mutagenicity tests and caused skin cancer when repeatedly applied to mice over their lifetime. This product may contain some middle distillates found to cause those adverse effects.

---

4. FIRST AID MEASURES

EYE:

No first aid procedures are required. However, as a precaution flush eyes with fresh water for 15 minutes. Remove contact lenses if worn.

SKIN:

Remove contaminated clothing. Wash skin thoroughly with soap and water. See a doctor if any signs or symptoms described in this document occur. Discard contaminated non-waterproof shoes and boots. Wash contaminated clothing.

INGESTION:

If swallowed, give water or milk to drink and telephone for medical advice. DO NOT make person vomit unless directed to do so by medical personnel. If medical advice cannot be obtained, then take the person and product container to the nearest medical emergency treatment center or hospital.

INHALATION:

If any signs or symptoms as described in this document occur, move the person to fresh air. If any of these effects continue, see a doctor.

NOTE TO PHYSICIANS:

Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

---

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT: (P-M) 125F (52C) Min.

AUTOIGNITION: NDA

FLAMMABILITY LIMITS (% by volume in air): Lower: 0.6 Upper: 4.7

EXTINGUISHING MEDIA:

CO_2, Dry Chemical, Foam and Water Fog.

NFPA RATINGS: Health 0; Flammability 2; Reactivity 0.

FIRE FIGHTING INSTRUCTIONS:

Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85 F.

For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment. This may include self-contained breathing apparatus to protect against the hazardous effects of normal products of combustion or oxygen deficiency. Read the entire document.

COMBUSTION PRODUCTS:

Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

---

6. ACCIDENTAL RELEASE MEASURES

CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (202)483-7616

ACCIDENTAL RELEASE MEASURES:

Eliminate all sources of ignition in vicinity of spill or released vapor.

Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.

U.S.A. regulations require reporting spills of this material that could reach any surface waters. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

7. HANDLING AND STORAGE

DO NOT USE OR STORE near flame, sparks or hot surfaces. USE ONLY IN WELL VENTILATED AREA. Keep container closed.

DO NOT weld, heat or drill container. Replace cap or bung. Emptied container still contains hazardous or explosive vapor or liquid.

CAUTION! Do not use pressure to empty drum or drum may rupture with explosive force.

WARNING! Not for use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Use this material only in well ventilated areas.

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION:

No special eye protection is usually necessary.

SKIN PROTECTION:

Avoid contact with skin or clothing. Skin contact should be minimized by wearing protective clothing including gloves.

RESPIRATORY PROTECTION:

No special respiratory protection is normally required. However, if operating conditions create high airborne concentrations, the use of an approved respirator is recommended.

---

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION:

Pale yellow liquid.

pH:	NDA
VAPOR PRESSURE:	0.04 PSIA @ 40C
VAPOR DENSITY (AIR=1):	NDA
BOILING POINT:	176 - 370C (348-698F)
FREEZING POINT:	NDA
MELTING POINT:	NA

SOLUBILITY:	Soluble in hydrocarbon solvents; insoluble in water.
SPECIFIC GRAVITY:	0.84 @ 15.6/15.6C (Typical)
EVAPORATION RATE:	NDA
VISCOSITY:	1.9 cSt @ 40C (Min.)
PERCENT VOLATILE (VOL):	NDA

---

10. STABILITY AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:

NDA.

CHEMICAL STABILITY:

Stable.

CONDITIONS TO AVOID:

No data available.

INCOMPATIBILITY WITH OTHER MATERIALS:

May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

HAZARDOUS POLYMERIZATION:

Polymerization will not occur.

---

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:

Minimal effects clearing in less than 24 hours.

SKIN EFFECTS:

Moderate irritation at 72 hours. (Moderate erythema). The dermal LD50 in rabbits is >5 ml/kg. This material was not a skin sensitizer in the Buehler Guinea Pig Sensitization Test.

ACUTE ORAL EFFECTS:

The oral LD50 in rats is > 5 ml/kg.

ACUTE INHALATION EFFECTS:

The 4-hour inhalation LC50 in rats is greater than 5 mg/l.

SUBCHRONIC EFFECTS:

The data above is obtained from studies sponsored by the American Petroleum Institute (API).

REPRODUCTION AND BIRTH DEFECTS:

Whole diesel engine exhaust was reviewed by the International Agency for Research on Cancer (IARC) in their Monograph 46 (1989). Evidence for causing cancer was considered sufficient in animals and limited in humans. IARC placed diesel exhaust in category 2A, considering it probably carcinogenic to humans.

The National Institute of Occupational Safety and Health (NIOSH) has recommended that whole diesel exhaust be regarded as potentially causing cancer. This recommendation was based on test results showing increased lung cancer in laboratory animals exposed to whole diesel exhaust. The excess risk of cancer for people exposed to diesel exhaust has not been determined as studies on exposed workers have been inconclusive. It is recommended that exposure to diesel exhaust be minimized to reduce the potential cancer risk.

---

12. ECOLOGICAL INFORMATION

ECOTOXICITY:

No data available.

ENVIRONMENTAL FATE:

No data available.

---

13. DISPOSAL CONSIDERATIONS

This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by USEPA under RCRA (40CFR261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

---

14. TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT SHIPPING NAME: GAS OIL

DOT HAZARD CLASS: COMBUSTIBLE LIQUID

DOT IDENTIFICATION NUMBER: UN1202

DOT PACKING GROUP: III

---

15. REGULATORY INFORMATION

SARA 311 CATEGORIES:		
	1. Immediate (Acute) Health Effects:	YES
	2. Delayed (Chronic) Health Effects:	YES
	3. Fire Hazard:	YES
	4. Sudden Release of Pressure Hazard:	NO
	5. Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01=SARA 313	11=NJ RTK	22=TSCA Sect 5(a)(2)
02=MASS RTK	12=CERCLA 302.4	23=TSCA Sect 6
03=NTP Carcinogen	13=MN RTK	24=TSCA Sect 12(b)
04=CA Prop 65-Carcin	14=ACGIH TWA	25=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	26=TSCA Sect 8(d)

06=IARC Group 1	16=ACGIH Calc TLV	27=TSCA Sect 4(a)
07=IARC Group 2A	17=OSHA PEL	28=Canadian WHMIS
08=IARC Group 2B	18=DOT Marine Pollutant	29=OSHA CEILING
09=SARA 302/304	19=Chevron TWA	30=Chevron STEL
10=PA RTK	20=EPA Carcinogen	

The following components of this material are found on the regulatory lists indicated.

KEROSINE

is found on lists: 02,10,11,

---

16. OTHER INFORMATION

NFPA RATINGS: Health 0; Flammability 2; Reactivity 0; (Least-0, Slight-1, Moderate-2, High-3, Extreme-4). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT:

This revision updates Section 1 (Chemical Product and Company ID).

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Toxicology and Health Risk Assessment Unit, CRTC, P.O. Box 4054, Richmond, CA 94804

****

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

NDA - No Data Available NA - Not Applicable

****

THIS IS THE LAST PAGE OF THIS MSDS.

****

APPENDIX C

WASTE DISPOSAL PLAN

THIS PAGE INTENTIONALLY LEFT BLANK

Section 3240 - Disposal

This section identifies storage and disposal options for oily waste generated by a significant oil release.

It is the goal of the Area Committee to have oil removed from impacted areas as soon as possible and to ultimately treat or dispose of the oily waste in the most efficient and environmentally sound manner.

Waste Types Expected

The following wastes may be generated during the response to an oil spill:

- Oil (petroleum product, crude or refined)
- Oil and seawater mixture
- Oil and freshwater mixture
- Oil saturated booms/absorbent pads
- Oil-contaminated debris, e.g. palm fronds, plant, etc.
- Petroleum contaminated soils, i.e. sand
- Oil contaminated wildlife (dead)

Quantities of each will vary depending on location of spill, size, and type of petroleum product.

Waste Handling and Disposal Instructions

Waste disposal procedures must be followed closely. Documentation of waste volumes and oil recovered is very important.

Oil, Oil and Seawater, Oil and Freshwater

1. Collect material with vacuum truck
2. Transport to location of bulk storage tank
3. Document volumes of oil and water recovered (tank gauging)

Oily Booms and Absorbent Pads, Oil-Contaminated Debris

1. Place oiled materials into plastic bags and then into visqueen-lined roll-offs or dumpsters
2. Transport to central storage area
3. Scale all loads into central storage area (indicate type of waste on scale ticket, obtain tare weight after off-loading waste)

Oily Soil

1. Place into visqueen-lined dump trucks
2. Decontaminate equipment used to excavate soil.
3. Transport to central storage area
4. Scale all loads into central storage area

Dead Wildlife

The recovery of oiled wildlife is the responsibility of the Wildlife Branch of the Operations Section. Before removing oiled wildlife get specific guidance from the Wildlife Branch. In general …

1. Collect in plastic bags
2. Label: date, time animal found, location found, and person finding animal (name and phone number)
3. Put on ice (chill) do not freeze

Special Instructions

Label all containers (roll-offs, dumpsters, etc.) with:

1. Type of material (soiled boom, absorbent pads, etc.)
2. Location (waste generation site)
3. Date
4. Name and phone number of contact person
5. Include the statement Recovered oil type contaminated material

Inland Storage of Oil-Water Mixtures and Oil

Either Chevron, Tesoro, or Hawaiian Electric may provide at least one bulk storage tank during a worst-case scenario. Tank selection will be based on the most available tank, e.g. tank with the lowest amount of stored product. Bulk storage tanks can handle between 176,000 and 300,000 barrels each.

Tesoro Hawaii Corporation

91-325 Komohana St.
Kapolei, Hawaii 96707
VP Refining: Alan R. Anderson
Phone: 808-547-3282

Chevron USA Hawaiian Refinery

91-480 Malakole St.
Kapolei, Hawaii 96707
Contact: Dave Rogers
Phone: 808-682-5711

Hawaii Electric Company

841 Ward Avenue
Honolulu, Hawaii
Contact: Plant Manager
Phone: 808-543-4474

Temporary Storage of Oil Saturated Sorbents and Debris

The Department of Health has agreed upon minimum standards necessary for shoreside temporary storage of oily waste. For specific guidance and concurrence of Solid Waste Management, call DOH at 586-4240. The primary objective of a cleanup activity is to remove the oiled debris from the impacted shoreline. Hawaiian Electric has stated it will be able to handle between 50 and 100 tons of oiled material on a daily basis, however, if its capabilities are exceeded or transportation problems necessitate temporary storage, then the following applies:

The primary method of storage should be in roll off dumpsters. These dumpsters should be lined and covered as is the standard industry practice.

If sufficient dumpsters can not be obtained, then an alternative method is to prepare an area by lining it with two layers of 6 mil plastic. If there is a significant amount of oil that may drip from the material, then the plastic should be covered with sorbent rug.

The area must be secured and access must be restricted.

Ingress and egress areas for heavy equipment must be maintained in a fashion which does not compromise the integrity of the liner.

Consideration must be given to covering the material to prevent excessive rain water from accumulation in the bermed area. This may also be required if the debris may be blown by strong winds.

Pre-Designated Areas

Temporary storage areas will be situated on the shore area near the impacted area. These area will be designated as satellite storage area where the waste will be staged prior to transfer to either disposal or centralized storage. Department of Health personnel will assist in locating the appropriate area taking into consideration access and other concerns. As soon as possible after the shoreline area has been cleaned and no further impact is expected, the oily waste should be moved to the centralized storage area.

Centralized Temporary Storage Areas

Areas on Oahu have been identified for centralized storage. These areas are identified due to their accessibility, convenience to disposal facilities and security. The same storage standards as outlined in "Temporary Storage of Oil Saturated Sorbents and Debris" should be followed for centralized temporary storage. When arranging to identify specific areas for storage at the following sites contact:

Department of Transportation

Kalaeloa Deep Draft Harbor
POC: Davis Yogi
Phone: 808-587-1928

Agreements are being coordinated with each County, Department of Public Works to utilize closed landfills on each island for centralized storage in an emergency. Contact the DOH, HEER office at 586-4249 for assistance.

Offshore Storage

Various barges and oil-response vessels are available.

Disposal Options

It is the policy of the Area Committee that oily waste should be disposed of in the most efficient and environmentally sound manner.

Disposal On or Near Oahu.

Incineration at H-Power is the preferred site for oily waste disposal on or near Oahu. Capacity or operational constraints may limit disposal of oily waste at H-Power.

The ACP recognizes that geographic locations outside of Oahu may not have timely access to H-Power and there are circumstances and waste types which are not conducive to incineration at H-Power. The State On-Scene Coordinator (SOSC) in charge of disposal should take the following factors into consideration:

- quantity of waste
- capacity of treatment/disposal options
- adequacy of temporary storage
- time requirements of treatment/disposal options
- effectiveness of treatment/disposal
- costs

The Area Committee has established the following hierarchy for disposal of oily waste:

- Incineration at H-Power (Oahu spills)
- Landfilling
- Bioremediation at Off-Site Facilities
- In-Situ Burning
- Refining

Incineration at H-Power (Oahu spills)

It has been agreed that H-Power will accept oily waste as a result of an emergency situation. See attached protocol and agreement for specific details regarding the approval (Enclosure 3240(A) -- *H-Power Disposal Agreement*). H-Power can process approximately 50 to 100 tons of oily waste per day. The following types of oily waste can be handled …

- Oil absorbent polypropylene material (cut into three foot segments and removal of all metal parts
- Litter and other small debris (small debris are generally anything less than 3"x4"x36")

Contact the following for incineration:

H-Power
Honolulu Resource Recovery Venture

91-174 Hanua Street
Kapolei, HI

Phone: 808-682-2099

Landfilling

For debris which is not acceptable for burning at Hawaiian Electric or other means of treatment, in a reasonable time and cost, it is agreed these materials may be disposed of at a lined landfill:

- Litter
- Green waste
- Bulky materials

Enclosure (D) of this section is a list of the *Hawaiian Landfills*.

Bioremediation at Off-Site Facilities

For sands and soils which are contaminated with gasoline or diesel, the material may be sent to PVT LANDFILL, POC: Mary Josue, Ph: 668-4561, www.pvtland.com. Landfarming of petroleum contaminated soils exists at private land in Nanakuli. This facility treats petroleum contaminated soils by adding moisture and turning the soils.

In-Situ Burning

In-situ burning of debris on shore is the final option besides "no-response". Burns shall be subject to the following conditions and approved by the State On-Scene Coordinator:

- wind speed>5kts
- wind direction away from the islands
- day-light hours
- thermal inversion considerations
- visual monitoring required

Weather conditions may be obtained by calling the National Weather Service 808-836-1831.

Refining

Both Chevron and Tesoro have the capabilities of re-refining recovered product. However, Chevron and Tesoro have conditions that must be met prior to acceptance of the product for re-refining. These conditions include …

- Age of the oil or oil-water mixture
- Identity of responsible party (owner of oil)
- Other potential contaminants.
- Volume

Decanting Policy

Decanting is the process of draining off recovered water from portable tanks, internal tanks, collection wells or other storage containers to increase the available storage capacity of recovered oil. When decanting is conducted properly most of the water can be removed from the collected petroleum.

Background

It is recognized that decanting of oily water mixtures is a common procedure used during a spill response incident. Hawaii understands the value of decanting as a disposal consideration. Oily water mixtures collected by Oil Spill Response Vessels (OSRV) utilize installed holding tanks for gravity separation of oil from water. Water recovered by this method can then be discharged back into a containment area.

Vacuum trucks are routinely used for oil recovery along shorelines and in shallow water. Prior to using an uncleaned vacuum truck for the collection of oil, with subsequent decanting of water, a check of the containment tank is required to ensure there are no contaminants from previous activities and that the water decanted is safe to discharge back into the environment. A chlorine test will be used for this purpose. A record of the test will be retained as part of the incident disposal file.

Goals

During spill response operations, mechanical recovery of oil is often restricted by a number of factors, including the recovery system's oil/water recovery rate, the type of recovery system employed and the amount of tank space available on the recovery unit to hold recovered oil/water mixtures. In addition, the longer oil remains on or in the water, the more it mixes to form an emulsified mousse or highly mixed oily/water liquid, which sometimes contains as much as 70% water and 30% oil, thus consuming significantly more storage space.

In many cases, the separation of oil and water and discharge of excess water is necessary for skimming operations to be effective in maximizing the amount of oil recovered and in minimizing overall environmental damages. Such actions should be considered and in appropriate circumstances authorized by the FOSC and/or the SOSC because the discharged water will be less harmful to the environment than allowing the oil to remain in the water and be subject to spreading and weathering.

Policy

During a response, it will likely be necessary for response contractors or a responsible party to **request from the Federal and/or State OSC** authority to decant while recovering oil so that response operations do not cease or become impaired. FOSC authorization is required in all cases and in addition SOSC authorization is required for decanting activities in state waters.

Expeditious review and approval, as appropriate, of such requests is necessary to ensure rapid and efficient recovery operation. The request, decision and permission to decant **must be documented**.

The Federal and State OSCs will consider each request for decanting on a case-by-case basis. Prior to approving decanting, the OSCs should evaluate the potential effects of weather including the wind and wave conditions, the quantity of oil spilled and the type of oil as well as available storage receptacles. The OSC should also take into account that recovery operations as enhanced by decanting will actually reduce the overall quantity of pollutants in a more timely and effective manner to facilitate cleanup operations.

The FOSC and/or SOSC will review and provide directions and authorization as appropriate to requests to wash down vessels, facilities and equipment to facilitate response activities.

Other activities related to possible oil discharges associated with an oil spill event such actions to save a vessel or protect human life which may include such actions as pumping bilges on a sinking vessel are not covered by this policy.

Criteria

The following criteria should be considered when determining whether decanting is applicable, unless circumstances dictate otherwise:

(1) All decanting should be done in a designated "Response Area" within a collection area, vessel collection well, recovery belt, weir area, or directly in front of a recovery system.

(2) Vessels employing sweep booms with recovery pumps in the apex of the boom should decant forward of the recovery pump.

(3) All vessels, motor vehicles and other equipment not equipped with an oil/water separator should allow retention time for oil held in internal or portable tanks before decanting commences.

(4) A containment boom will be deployed around the collection area to minimize loss of the decanted oil or entrainment.

(5) Visual monitoring of the decanting area shall be maintained so that

discharge of oil in the decanted water is detected promptly.

(6) Prior to using an uncleaned vacuum truck for the collection of oil, with subsequent decanting of water, a check of the containment tank is required to ensure there are no contaminates from previous activities and that the water is safe to discharge back into the environment. A chlorine test will be used for this purpose. A record of the test results will be retained as part of the incident disposal file.

Disposal Plan

As a help in writing an incident disposal plan, two sets of forms have been developed:

- Enclosure (B) of this section is the *Waste Management and Disposal Plan* and,
- Enclosure (C) of this section is the *Waste Management and Disposal Plan Update* (this form set is used to make changes to the original plan).

PROTOCOL & AGREEMENT FOR THE DISPOSAL OF
NON-HAZARDOUS ABSORBENT MATERIAL CONTAMINATED WITH UNUSED
PETROLEUM PRODUCTS OR CRUDE OIL
AT H-POWER

INTRODUCTION

This protocol and agreement is for the disposal of non-hazardous absorbent material contaminated with unused petroleum products or crude oil, hereafter referred to as oily absorbent material (OAM), as a result of an unused petroleum product or crude oil spill cleanup (e.g., sweeps, booms, absorbent pads, and pom poms). A list of pre-approved absorbent material is provided at the end of this agreement.

In general, it is agreed that the disposal of OAM at H-Power is the preferred disposal alternative, particularly for OAM generated on Oahu. Furthermore, the City and County of Honolulu agrees to accept OAM for disposal at H-Power from Oahu generators, as well as from neighbor island generators.

The Department of Health (DOH) agrees that OAM is not by definition "used oil" (or waste oil) under 40 CFR 279. Furthermore, due to knowledge gained from past testing of OAM, the DOH agrees that OAM is not a regulated hazardous waste pursuant to 40 CFR 261 or Title 11, Chapter 261 HAR. When disposed of at H-Power, this material is considered to be solid waste by the DOH and therefore does not need to meet the used oil specification standards.

This protocol is agreed upon by the State of Hawaii Department of Health, the City and County of Honolulu, and Honolulu Resource Recovery Venture.

PROTOCOL

1. Identification. Clearly establish and identify the petroleum products(s). OAM contaminated with only products of :
Jet A,
Crude oil,
Diesel fuel,
Fuel oil,
Lube oil, and
Hydraulic oil

may be disposed of at H-power without sampling in accordance with item #2. OAM contaminated with gasoline, waste oil, or unknown products should be individually sorted and tested, unless sufficient knowledge is provided to DOH substantiate that the specific OAM does not exhibit hazardous waste characteristics.

2. Sampling. Take a representative sample of any suspect material to determine if it meets the criteria for hazardous waste. Any material which may be contaminated with something other than an unused petroleum product or crude oil, and either salt water or fresh water should be tested for hazardous waste constituents prior to disposal.

3. Preparation. OAM material should not contain any free liquids. Petroleum products and water should be removed from the OAM as much as possible. Cut boom into sections no longer than three (3) feet and remove all metal pieces.

4. Disposal. If the waste material is prepared according to item #3 and determined to be non-hazardous, then the OAM may be taken to H-Power for disposal. Inform the operator about the nature of the material.

5. Record keeping. For any suspect material to be analyzed, results of the analysis shall be forwarded to H-Power prior to delivery. At a minimum records shall be kept by the generator which includes verification of the sampling date, the date of analysis, laboratory results, and the date and amount of material delivered to H-Power.

PRE-APPROVED ABSORBANT MATERIAL

1. Polypropylene
2. Cotton cloth

This agreement is hereby entered into the parties below.

(*Signed*) 3/27/96
BRUCE S. ANDERSON Date
Deputy Director for
Environmental Health

(*Signed*) 4/12/96
KEN SPRAGUE, Chief Engineer Date
City and County of Honolulu
Department of Public Works

(*Signed*) 5/9/96
John M. Klett, EVP Date
Honolulu Resource Recovery Venture

Oahu Waste Energy Recovery, Inc. - General Partner
Ogden Projects of Hawaii, Inc. - General Partner

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	Estimated Volumes(s)
☐ Oiled Natural Inorganic (Sand, Pebbles, Etc.)		
☐ Oiled Natural Organic (Driftwood, Seaweed, Etc.)		
☐ Man-Made Materials (PPE, Sorbents, Etc.)		
☐ Unoiled Solids		
☐ Other		

Suspected Hazardous Waste? .... ☐ Yes ☐ No

Determination by Generator Knowledge? .... ☐ Yes ☐ No

Hazardous Waste Code(s): ______________________________

____

Comments: ______________________________

____

____

____

Liquids

Type	Description	Estimated Volumes(s)
☐ Oil/Water Mixtures	______	______
	______	______
	______	______
☐ Uncontaminated Petroleum Products	______	______
	______	______
	______	______
☐ Waste Water	______	______
	______	______
	______	______
☐ Spent Solvents/Dispersants and Fuels	______	______
	______	______
	______	______
☐ Other	______	______
	______	______
	______	______

Suspected Hazardous Waste? .... ☐ Yes ☐ No

Determination by Generator Knowledge? .... ☐ Yes ☐ No

Hazardous Waste Code(s): ______________________________

Comments: ______________________________

Temporary Waste Storage

Storage Type	Estimated Capacity/Number Required

Preferred Location(s): ______________________________

Permit Required for Temporary Storage: ______________________________

Ground/Runoff Protection Required for Storage Area? ...... ☐ Yes ☐ No

Liners/Cover Protection Required for Storage? .... ☐ Yes ☐ No

Comments: ______________________________

Waste Transportation

Waste Type/Description	Proposed Transport Method

Permit Required for Temporary Transportation: ______________________________

Liners/Cover Protection Required for Storage? .... ☐ Yes ☐ No

Comments: ______________________________

Disposal Method(s)

Method	Waste Type/Description	Available	Selected
Natural Degradation/Dispersion	______________ ______________	☐	☐
Wastewater Treatment Plant	______________ ______________	☐	☐
Landfill	______________ ______________	☐	☐
Land Farm	______________ ______________	☐	☐
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	Resources(s)

Permit(s) Required for Disposal: ____________________

Comments: ____________________

Health and Safety Procedures

Waste Type/Description

Heath and Safety Plan Attached? .... ☐ Yes ☐ No

Comments:

Additional Comments

Contacts and Approvals

Contact for Further Information:

Approved By: Time/Date:

Comments:

Waste Management and Disposal Plan Update

Incident Name: ______________________________

Date Prepared: ____________ Time Prepared: ____________

Updating Plan Dated: ______________________________

____

Location(s)/Division(s) Covered: ______________________________

____

Changes to Agency Information

Lead Agency: ______________________________

Agency Representative(s): ______________________________

____

Telephone(s): ______________________________

Comments: ______________________________

____

____

____

____

____

Variances

Variance(s) Obtained?.. ☐ Yes ☐ No

Date(s) Received/Expected: ______________________________

Copies Attached?.. ☐ Yes ☐ No

Comments: ______________________________

____

____

____

____

____

____

To be Used Only as Supplement to Original Waste Management and Disposal Plan

Samples

Sample(s) Analysis Received? .... ☐ Yes ☐ No

Date(s) received/Expected: ____________________

Copy of Analysis Attached? .... ☐ Yes ☐ No

Chain of Custody Form(s) Attached?................................. ☐ Yes ☐ No

Comments: ____________________

Changes to Waste Covered by Plan

Temporary Waste Storage

Storage Facility Utilized	Storage Type(s) / Capacity and Number	Location

Necessary permit(s) Received? .... ☐ Yes ☐ No

Date(s) Received/Expected: ______________________________

Copy Attached? .... ☐ Yes ☐ No

____

Ground/Runoff Protection Required for Storage Area? ...... ☐ Yes ☐ No

____

____

Liners/Cover Protection Required for Storage? .... ☐ Yes ☐ No

____

____

Comments: ______________________________

Waste Transportation

Transportation Method(s)

Waste Type/Description	Transport Method Selected	Resource/Contractor Selected

Map/Diagram of Storage and Pickup Sites Attached? .... ☐ Yes ☐ No

Necessary Permits/Licenses Received?............................ ☐ Yes ☐ No

Date(s) Received/Expected: ______________________________

Liners/Cover Protection Required for Transportation? .... ☐ Yes ☐ No

Comments: ______________________________

Changes to Disposal Methods

____
____
____
____
____
____
____

Disposal Resources Selected

Disposal Method	Resource(s)	Location

Disposal Permit Application Submitted? .... ☐ Yes ☐ No

Application(s) Approved? .... ☐ Yes ☐ No

Date(s) Received/Expected: ____

Copy Attached? .... ☐ Yes ☐ No

Comments: ____
____
____
____
____
____

Changes to Health and Safety Procedures

Updated Health and Safety Plan Attached .... ☐ Yes ☐ No

Comments: ______________________________

Additional Comments

Contacts and Approvals

Contact for Further Information: ______________________________

Approved By: ______________________________ Time/Date: ______________

Comments: ______________________________

APPENDIX D

PIPELINE RESPONSE PLAN

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX D
TABLE OF CONTENTS
PIPELINE RESPONSE PLAN

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX D PIPELINE RESPONSE PLAN

D.1 PIPELINE INFORMATION SUMMARY

This Appendix includes the information summary required by the United States Department of Transportation (US DOT), Pipeline and Hazardous Material Safety Administration (PHMSA) for the pipeline extending from the Hawaiian Electric Barbers Point Tank Farm to the HECO Kahe Generating Station. A cross-reference to PHMSA Facility Response Plan requirements found in this Facility Spill Response Plan is presented in the Introduction Section of this FSRP.

The Kahe Pipeline supplies the Kahe Generating Station storage tanks with low sulfur fuel oil (LSFO) from the Hawaiian Electric Barbers Point Tank Farm. Biofuel with physical properties similar to LSFO may also be transported through the pipeline. The pipeline is owned by Hawaiian Electric, and operated by Chevron. Normally, the Kahe pipeline system operates on a continuous basis. The pumping rate varies between 350 and 1000 barrels per hour (bph) depending on the power plant's need. The rate is normally specified by the Operations Coordinator. (b) (7)(F), (b) (3) [redacted] Discharge detection should occur within less than five minutes. With the assistance of Chevron, HECO will take the lead for response, abatement, and cleanup of pipeline discharges.

Information to address the requirements of the Department of Transportation's Pipeline and Hazardous Material Safety Administration (PHMSA) is presented in this appendix of the FSRP.

The pipeline is approximately five miles long and is located in Honolulu County, comprising a single response zone. The pipeline routing is shown on Figure D-1.

The line is an 8.625 inch (outside diameter), grade X-42, schedule 40, with a wall thickness of 0.322 inches, corrosion coated with a mixture of Fusion Bonded Epoxy and conventional tape wrap, and has 2" of urethane foam insulation under a HDPE jacket for the first 2,962 feet. At certain locations (i.e., waterways, railroads, etc.) the wall thickness is 0.500 inches. The pipeline is also cathodically protected. The total line displacement is 1,700 bbls. A (b) (7)(F), (b) (3) [redacted]

The majority of the pipeline is buried. Pipeline cover varies along its length, averaging four feet. The pipeline was laid in 1958, partially rerouted in 1982 and partially rerouted again in 2004. It was constructed and has been repaired and/or replaced in accordance with applicable regulations, specifications and recommended practices. There are no breakout tanks in the line. The maximum operating pressure is 1,315 psig at normal operating temperature (190° F to 200° F).

Additional information and operating procedures are presented in the *Pipeline Operation and Maintenance Manual*.

THIS PAGE INTENTIONALLY LEFT BLANK

Figure D-1

Pipeline Routing Map

THIS PAGE INTENTIONALLY LEFT BLANK

This Facility Spill Response Plan (FSRP) is designed to provide guidance for the emergency response to spills associated with the operation of the Kahe pipeline. It is intended to be used in coordination with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and the Hawaiian Area Contingency Plan (HACP). Periodic revisions to the plan will be made to achieve consistency with the NCP and HACP, and will be conducted in accordance with the procedures outlined in Sections 3.4 and D.5.2.

The operators and responders are English speaking, and therefore a second language translation of this FSRP is not required at this time.

Name and Address of Owner

Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, HI 96840-0001
(808) 548-2508

Name and Address of Operator

Chevron U.S.A. Products Company
91-480 Malakole Street, A
Kapolei, Hawaii 96707
(808) 682-4711 (24-hour emergency number)

Description of Response Zone

The pipeline is located within a single response zone which extends from the Barbers Point Tank Farm to the Hawaiian Electric Kahe Generating Station. The response zone is located in Honolulu County in the State of Hawaii.

Name and Phone Number of the Qualified Individual

The primary Qualified Individual is:
Anthony Ramelb - Senior Shift Supervisor, Kahe Generating Station
(808) 543-4140 - Office
(b) (6) [redacted] – Mobile

To ensure that a QI is available 24 hours a day, the following alternate QIs have been designated.

Teddy Canterbury
Kahe Operations Superintendent
(808) 543-4100 - Office
(b) (6) [redacted] - Mobile

Anthony Taparra
Waiau Operations Superintendent
(808) 543-4321 - Office
(b) (6) [redacted] Mobile

List of Line Sections

Section D.5 includes pipeline drawings which show the route of the pipeline.

Determination of Substantial Harm

The Kahe pipeline may cause substantial harm to the environment in the event of a release due to its close proximity to waters of the United States. Sensitive environments exist off the coast along the pipeline route. However, the pipeline does not meet the definition in 49 CFR194.103(c) for significant and substantial harm because the total length is less than the 10 - mile criteria.

Type of Oil

The product transported through the Kahe pipeline is low sulfur fuel oil (LSFO) for use by the Kahe Generating Station. Diesel is occasionally transported through the pipeline as a displacement medium. Biofuel (e.g., crude palm oil) may also be transported through the pipeline. A Material Safety Data Sheets (MSDS) for LSFO and diesel are provided in Appendix B of this FSRP.

Volume of Worst Case Discharge

(b) (7)(F), (b) (3) [redacted]

D.1.1 Certification

Hawaiian Electric Company, Inc. certifies that the necessary personnel and equipment will be available to respond, to the maximum extent practicable, to a worst case discharge or a substantial threat of such a discharge as described in Sections D.3 and 3.6.

D.2 NOTIFICATION

Notification procedures are presented in Section 1.2

D.2.1 DOT Liquid Pipeline Accident Report

An accident report is required under 49 CFR 195.50 for each failure in a pipeline system subject to this part in which there is a release of the hazardous liquid or carbon dioxide transported resulting in any of the following:

(a) Explosion or fire not intentionally set by the operator.
(b) Release of 5 gallons (19 liters) or more of hazardous liquid or carbon dioxide, except that no report is required for a release of less than 5 barrels (0.8 cubic meters) resulting from a pipeline maintenance activity if the release is:
    (1) Not otherwise reportable under this section;
    (2) Not one described in §195.52(a)(4);

(3) Confined to company property or pipeline right-of-way; and
(4) Cleaned up promptly;

(c) Death of any person;
(d) Personal injury necessitating hospitalization;
(e) Estimated property damage, including cost of clean-up and recovery, value of lost product, and damage to the property of the operator or others, or both, exceeding $50,000.

This report must be filed with DOT within 30 days after discovery of the accident using DOT Form 7000-1.

D.2.2 Communication Methods

The primary means of communication between the Kahe Generating Station and the pipeline operators at the Chevron refinery and the oil spill response resources is by telephone. Secondary communication method between the Kahe Generating Station and the Chevron refinery is two-way radios. An inter-island communication system is also available which is separate from the public telephone system.

D.3 PIPELINE WORST CASE DISCHARGE

The worst case discharge (WCD) volume was calculated for the Kahe pipeline according to the requirements in 49 CFR 194.105. The pipeline 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, release times, shutdown response times and line drainage volume under adverse weather conditions.

A maximum release (detector) time of two hours is used which represents the longest time that operations would continue in the event that communications between the Kahe Generating Station and the Chevron Refinery were interrupted. However, as described in Section 1.6.3, there are several other monitoring and control systems, in place which allow rapid detection of abnormal pipeline operations.

Therefore, the actual release time would probably be substantially less than two hours.

(b) (7)(F), (b) (3)
[redacted]

This WCD is significantly less than the WCD calculated for the facility according to EPA protocol. Previous sections demonstrate Hawaiian Electric's and their response resources' capability to respond to this much larger WCD within the required tiered response times. Therefore, the available response resources will be more than sufficient to address a pipeline WCD.

D.4 RECOGNIZING ABNORMAL OPERATING CONDITIONS

Any situation or condition that deviates from normal operating procedures but does not result in pipeline failure is considered an incident, or an abnormal operating condition. This section describes the proper incident recognition, response, and notification procedure for technical and supervisory personnel to address the substantial threat of a worst case discharge.

All operating and maintenance personnel must be capable of recognizing and reporting any conditions or incidents that are abnormal and that could cause the pipeline to operate outside of its design limits resulting in the substantial threat of a discharge. The following sections identify what conditions constitute abnormal operating conditions. It is important that all field personnel understand the importance of these abnormal conditions. For this reason, the following sections also describe what effect the conditions may ultimately have on the pipeline.

Unintended Valve Closure

Any unintended closure of a valve on an active portion of the pipeline is considered an abnormal condition. The unintended closure of a valve could cause an increase in pressure within the pipeline above the MOP.

Unintended Shut-Down

Any unintended shut-down of the pipeline is considered an abnormal condition. The unintended shut-down of the pipeline could cause abnormally low or high pressures in other portions of the pipeline.

Increase in Pressure above Normal Operating Limits

Any increase in pressure above the normal operating limits of the pipeline is considered an abnormal condition. The increase in pressure could indicate the unintended closure of a valve within the pipeline.

Decrease in Pressure below Normal Operating Limits

Any decrease in pressure below the normal operating limits of the pipeline is considered an abnormal condition. The decrease in pressure could indicate a line rupture downstream, the unintended shut-down of a pumping unit up stream, etc.

Increase in Flowrate above Normal Operating Limits

Any increase in flowrate above the normal operating limits of the pipeline is considered an abnormal condition. The increase in flowrate could indicate a line rupture downstream, the unintended opening of a valve into another portion of the pipeline, etc.

Decrease in Flowrate below Normal Operating Limits

Any decrease in the flowrate below the normal operating limits of the pipeline is considered an abnormal condition. The decrease in flowrate could indicate the unintended closure of a downstream valve, the unintended shut-down of a pumping unit, etc.

Loss of Communication

Any loss of data or voice communication is considered an abnormal condition. If the communication of critical operating control data is out for more than 15 minutes, the Senior Shift Supervisor or Utility Operators have the choice of shutting down the affected portion of the pipeline, or requesting that additional operating personnel man the facilities to adequately and safely operate the system.

Operation of any Safety Device: Alarm or Shut-Down

Any operation of a safety device, either an alarm or shut-down, on the pipeline is considered an abnormal condition. The operation of a safety device indicates that an unintended operation or malfunction of some portion of the pipeline equipment has likely occurred.

Any Malfunction of Equipment or Component

Any malfunction of equipment or component on the pipeline is considered an abnormal condition. The malfunction of any equipment or component could mean the pipeline is incapable of properly reacting to normal or abnormal operating conditions.

Deviation from Normal

Any deviation from the normal operations of the pipeline is considered an abnormal condition. Any deviation from the normal operations could indicate the failure of some portion of the pipeline, an operating error, or the miscommunication of an intended operating event. All of these events could lead to the unsafe operation of the pipeline.

Operating Error

Any operating error on the pipeline is considered an abnormal condition. Any operating error could indicate the miscommunication of an intended operating event, the lack of training of operating personnel concerning the operating procedure, or other personnel related problems.

D.4.1 Reporting and Responding to Abnormal Operating Conditions

In the event that an abnormal operating condition exist, HECO's operating personnel will report the condition by radio, or telephone, to the Shift Supervisor. If the cause of the abnormal operating condition cannot be (or has not been) immediately corrected and the integrity and safe operation of the pipeline is ensured, the Shift Supervisor will coordinate with the operating and maintenance personnel to safely shut-down the affected portion of the pipeline. Once the cause has been identified and corrected, and pipeline integrity has been confirmed, the Operations Superintendent will authorize the restart of the affect portion of the pipeline.

Section 4.0 of Chevron's "Pipeline Specific Operations Manual" discusses abnormal operations and response actions in detail.

D.5 PLAN REVIEW AND UPDATE PROCEDURES

The Facility Spill Response Plan (FSRP) will be reviewed and amended as described in this section to reflect facility changes that affect the worst case discharge, or the ability to fully implement the plan; the plan will also be revised periodically.

D.5.1 Amendments for Change Affecting Plan Implementation

The plan will be amended whenever there is a significant change that affects the implementation of the response plan. Significant changes may include:

- A change in the facility's configuration, including extension, relocation or replacement of the HECO Kahe pipeline, that materially alters the information included in the plan.
- A change in the type of oil handled, stored or transferred that materially alters the required response resources;
- A material change in capabilities or name of the oil spill removal organization(s) that provide equipment and personnel to respond to discharges of oil described in the plan;
- A material change in the facility's spill prevention and response equipment or emergency response procedures;
- A change in the qualified individual;
- A change in ownership;
- A change in the NCP or ACP that has significant impact on the equipment appropriate for response activities; and
- Any other changes that materially affect implementation of the plan.

HECO will resubmit revised portions of the response plan to EPA within 60 days and to PHMSA within 30 days of significant changes at each facility that substantially affect implementation of the Response Plan.

D.5.2 Periodic Reviews and Evaluations

A review and evaluation will be performed at least once every three years to comply with the regulatory requirements. As a result of the review and evaluation, the plan will be amended, if necessary, to include more current and effective response measures.

A review will also be conducted after an actual worst case discharge to evaluate and record the plan’s effectiveness. This review will consist of a debriefing meeting conducted by the QI or IC which addresses the following plan components:

- structure and organization
- communications
- equipment capability and response time
- adequacy of response effort

- public relations
- emergency medical services
- evacuation

Based on FSRP post incident evaluation results, improvements identified from the review will be incorporated into the FSRP when practical and economically feasible. Revisions resulting from the post-incident evaluation results will be submitted to PHMSA as discussed above.

D.5.3 FSRP Review and Amendment Documentation

Each review of and revision to the plan will be documented in the Record of Revisions (Introduction Section). Documentation shall include a summary of the review, the number, date, and plan section(s) affected by the review, and the name and signature of the person completing the review.

D.6 DIAGRAMS

Pipeline diagrams are provided on the following pages.

THIS PAGE INTENTIONALLY LEFT BLANK

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

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

[redacted]

APPENDIX E

ACRONYMS and GLOSSARY

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX E
GLOSSARY

Acronyms and Abbreviations

ACP	Area Contingency Response Plan
AMPD	Average Most Probable Discharge
ANSI	American National Standards Institute
B&S	Blending and Shipping Division
bbl	Barrel
CFR	Code of Federal Regulations
CIC	Clean Islands Council
COTP	US Coast Guard Captain of the Port
CWA	Clean Water Act
DOC	Department of Commerce
DOH	Hawaii Department of Health
DOI	Department of Interior
DOT	Department of Transportation
dwt	Dead weight ton
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FOLR	Fuel Oil Loading Rack
FOSC	Federal On-Scene Coordinator
FSRP	Facility Spill Response Plan
FWPCA	Federal Water Pollution Control Act
FWS	Fish and Wildlife Service
HACP	Hawaii Area Contingency Plan
HAZMAT	Hazardous Materials
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCS	Hazard Communication Standard
HECO	Hawaiian Electric Company, Inc.
HEPA	High Efficiency Particulate Air
HWM	Hazardous Waste Manifest
IC	Incident Commander
ICS	Incident Command System
LSFO	Low Sulfur Fuel Oil

Acronyms and Abbreviations (Continued)

MMPD	Maximum Most Probable Discharge
MSDS	Material Safety Data Sheet
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NRC	National Response Center
NRCES	National Response Corporation Environmental Services
NRDA	Natural Resource Damage Assessment
NRT	National Response Team
OPA 90	Oil Pollution Act of 1990
ORT	Onsite Response Team
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Act
OSRV	Oil Spill Response Vessel
OWS	Oil Water Separator
PFD	Personal Flotation Devices
PHMSA	Pipeline and Hazardous Material Safety Administration
PIC	Person in Charge
PPE	Personal Protective Equipment
ppm	Parts per million
QI	Qualified Individual
RCRA	Resource Conservation and Recovery Act
RRT	Regional Response Team
SARA	Superfund Amendments and Reauthorization Act
SCAT	Shoreline Cleanup Assessment Team
SCBA	Self-Contained Breathing Apparatus
SOSC	State On Scene Coordinator
SPCC	Spill Prevention Control and Countermeasure Plan
TSD	Treatment, Storage, and Disposal
TTLR	Tank Truck Loading Rack
TWA	Time Weighted Average
USC	United States Code
USCG	United States Coast Guard
WCD	Worst Case Discharge

Definitions

Terrestrial means relating to land as distinct from air or water.

33 CFR 154.105 Definitions

Except as otherwise defined by NVIC 7-92, definitions in 33 CFR 154.105 are also relevant to the plan.

Captain of the Port (COTP) means the U.S. Coast Guard officer commanding a Captain of the Port Zone described in Section 3 of this OSCP, or that person's authorized representative.

Commandant means the Commandant of the U.S. Coast Guard or an authorized representative.

Contiguous Zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone, but not extending beyond 12 miles from the baseline from which the breadth of the territorial sea is measured.

District Commander means the officer of the U.S. Coast Guard designated by the Commandant to command a U.S. Coast Guard District, as described in Section 3 of this OSCP, or an authorized representative.

Facility means either an onshore facility or an offshore facility and includes, but is not limited to, structures, equipment, and appurtenances thereto, used or capable of being used to transfer oil to or from a vessel or a public vessel. A facility includes federal, state, municipal, and private facilities.

Facility Operator means the person who owns, operates, or is responsible operation of a facility.

Mobile Facility means any facility that can readily change location, such as a tank truck or tank car, other than a vessel or public vessel.

Monitoring Device means any fixed or portable sensing device used to monitor for a discharge of oil onto the water, within or around a facility, and designed to notify operating personnel of a discharge of oil.

Officer in Charge, Marine Inspection (OCMI) means the U.S. Coast Guard officer commanding a Marine Inspection Zone described in Section 3 of this OSCP, or an authorized representative.

Offshore Facility means any facility of any kind located in, on, or under any of the navigable waters of the United States other than a vessel or a public vessel.

Person-in-Charge means an individual designated as a person in charge of oil transfer operations under §154.710 (for facilities) or §155.700 (for vessels) of this OSCP.

Tank Barge means any vessel not equipped with a means of self-propulsion.

Tank Vessel means any vessel that carries oil in bulk as cargo or in residue.

Transfer means any movement of oil to, from, or within a vessel by means of pumping, gravitation, or displacement.

Vessel Operator means a person who owns, operates, or is responsible for the operation of a vessel.

NVIC 7-92 Definitions

Adverse Weather means the weather conditions that will be considered when identifying response systems and equipment in a response plan for the applicable operating environment. Factors to consider include significant wave height, ice, temperature, weather-related visibility, and currents within the Captain of the Port (COTP) zone in which the systems or equipment are intended to function.

Average Most Probable Discharge means a discharge of the lesser of 50 barrels or 1 percent of the volume of the worst case discharge.

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

Contract or Other Approved Means includes:

(1) A written contractual agreement with a response contractor. The agreement should identify and ensure the availability of the specified personnel and equipment described under NVIC 7-92 within stipulated response times in the specified geographic areas;
(2) Certification by the facility owner or operator that the specified personnel and equipment described under NVIC 7-92 are owned, operated, or under the direct control of the facility owner or operator, and are available within stipulated times in the specified geographic areas;
(3) Active membership in a local or regional oil spill removal organization that has identified specified personnel and equipment described under NVIC 7-92 that are available to respond to a discharge within stipulated times in the specified geographic areas;
(4) A document which:
    (i) Identifies the personnel, equipment, services, capable of being provided by the response contractor within stipulated response times in specified geographic areas;
    (ii) Sets out the parties' acknowledgment that the response contractor intends to commit the resources in the event of a response;
    (iii) Permits the Coast Guard to verify the availability of the response resources identified through tests, inspections, and drills; and
    (iv) Is incorporated by reference in the response plan; or
(5) For a facility that could reasonably be expected to cause substantial harm to the environment, with the consent of the response contractor or oil spill removal organization, the identification of a response contractor or oil spill removal organization with specified

equipment and personnel which are available within stipulated response times in specific geographic areas.

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

Facility That Could Reasonably be Expected to Cause Significant and Substantial Harm means any fixed MTR onshore facility (including piping and any structures that are used for the transfer of oil between a vessel and a facility) that is capable of transferring oil, in bulk, to or from a vessel of 250 barrels or more, and a deepwater port. This also includes any facility specifically identified by the COTP under Sections 3.

Facility That Could Reasonably be Expected to Cause Substantial Harm means any mobile MTR facility that is capable of transferring oil to or from a vessel with a capacity of 250 barrels or more. This also includes any facility specifically identified by the COTP under Section 3 of Appendix A of NVIC 7-92.

Great Lakes means Lakes Superior, Michigan, Huron, Erie, and Ontario, their connecting and tributary waters, the Saint Lawrence River as far as Saint Regis, and adjacent port areas.

Higher Volume Port Area means the ports of:

(1) Boston, MA.
(2) New York, NY.
(3) Delaware Bay and River to Philadelphia, PA.
(4) St. Croix, VI.
(5) Pascagoula, MS.
(6) Mississippi River from Southwest Pass, LA. to Baton Rouge, LA.
(7) Louisiana Offshore Oil Port (LOOP), LA.
(8) Lake Charles, LA.
(9) Sabine-Neches River, TX.
(10) Galveston Bay and Houston Ship Channel, TX.
(11) Corpus Christi, TX.
(12) Los Angeles/Long Beach Harbor, CA.
(13) San Francisco Bay, San Pablo Bay, Carquinez Strait, and Suisun Bay to Antioch, CA.
(14) Straits of Juan De Fuca and Puget Sound, WA.
(15) Prince William Sound, AK.

Inland Area means the area shoreward of the boundary lines defined in 46 CFR Part 7, except in the Gulf of Mexico. In the Gulf of Mexico, it means the area shoreward of the lines of demarcation (COLREG lines) defined in §§ 80.740 - 80.850 of title 33 of the CFR. The inland area does not include the Great Lakes.

Marine Transportation-Related Facility (MTR Facility) means an onshore facility, including piping and any structure used to transfer oil to or from a vessel, subject to regulation under 33 CFR Part 154 and any deepwater port subject to regulation under 33 CFR part 150.

Maximum Extent Practicable means the planning values derived from the planning criteria used to evaluate the response resources described in the response plan to provide the on-water recovery capability and the shoreline protection and cleanup capability to conduct response activities for a worst case discharge from a facility in adverse weather.

Maximum Most Probable Discharge means a discharge of the lesser of 1,200 barrels or 10 percent of the volume of a worst case discharge.

Nearshore Area means the area extending seaward 12 miles from the boundary lines defined in 46 CFR Part 7, except in the Gulf of Mexico. In the Gulf of Mexico, it means the area extending seaward 12 miles from the line of demarcation (COLREG lines) defined in §§ 80.740 - 80.850 of title 33 of the CFR.

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

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

Non-Petroleum Oil means oil of any kind that is not petroleum-based. It includes, but is not limited to, animal and vegetable oils.

Ocean means the offshore area and nearshore area as defined in Appendix A, NVIC 7-92.

Offshore Area means the area beyond 12 nautical miles measured from the boundary lines defined in 46 CFR part 7 extending seaward to 50 nautical miles, except in the Gulf of Mexico. In the Gulf of Mexico it is the area beyond 12 nautical miles of the line of demarcation (COLREG lines) defined in §§ 80.740-80.850 of title 33 of the CFR extending seaward to 50 nautical miles.

Oil Spill Removal Organization means an entity that provides response resources.

Operating Area refers to the Rivers and canals, Inland, Nearshore, Great Lakes, or Offshore geographic location(s) in which a facility is handling, storing, or transporting oil.

Operating Environment refers to Rivers and canals, Inland, Great Lakes, or Ocean. These terms are used to define the conditions in which response equipment is designed to function.

Persistent Oil means a petroleum-based oil that does not meet the distillation criteria for a non-persistent oil. For the purposes of NVIC 7-92, persistent oils are further classified based on specific gravity as follows:

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

Qualified Individual(s) (QI) means an English-speaking representative(s) of the facility identified in the OSCP, located in the United States, available on a 24-hour basis, familiar with implementation of the facility response plan, and trained in his/her responsibilities under the OSCP.

The owner or operator should provide each QI and alternate QI identified in the plan with a document designating them as a QI and specifying their full authority to:

(1) Activate and engage in contracting with oil spill removal organization(s);
(2) Act as a liaison with the predesignated Federal On-Scene Coordinator (OSC); and
(3) Obligate funds required to carry out all necessary or directed response activities.

The owner or operator of a facility may designate an organization to fulfill the role of the QI or alternate QI. The organization should then identify a QI and at least one alternate QI in accordance with this section.

The QI is not responsible for:

(1) The adequacy of response plans prepared by the owner or operator; or
(2) Contracting or obligating funds for response resources beyond the full authority contained in their designation from the owner or operator of the facility.

Response Activities means the containment and removal of oil from the water and shorelines, the temporary storage and disposal of recovered oil, or the taking of other actions as necessary to minimize or mitigate damage to the environment.

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

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

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

<u>Substantial Threat of a Discharge</u> means any incident or condition involving a facility that may create a risk of discharge of fuel or cargo oil. Such incidents include, but are not limited to storage tank or piping failures, above ground or underground leaks, fires, explosions, flooding, spills contained within the facility, or other similar occurrences.

<u>Worst Case Discharge</u> means in the case of an onshore MTR facility, the largest foreseeable discharge in adverse weather conditions meeting the requirements of Section 5.2 of NVIC 7-92, Change 1.

(a) Where required, the response plan may use the criteria in this section to develop the worst case discharge

(b) For the MTR portion of an onshore facility, not less than--

  (1) Where applicable, the loss of the entire capacity of all in-line and breakout storage tank(s) needed for the continuous operation of the pipeline(s) used for the purposes of handling or transportation oil, in bulk, to or from a vessel regardless of the presence of secondary containment; plus

  (2) The discharge from all piping carrying oil between the marine transfer manifold and the non-transportation-related portion of the facility. The discharge from each pipe is calculated as follows: the maximum time to discover the release from the pipe in hours, plus the maximum time to shut down flow from the pipe in hours (based on historic discharge data or the best estimate in the absence of historic discharge data for the facility) multiplied by the maximum flow rate expressed in barrels per hour (based on the maximum relief valve setting or maximum system pressure when relief valves are not provided, whichever is greater) plus the total line drainage volume expressed in barrels for the pipe between the marine manifold and the non-transportation-related portion of the facility; and

(c) For a mobile facility it means the loss of the entire contents of the container in which the oil is stored or transported.