Appendix C: Pacific Missile Range Facility - Oil and Hazardous Substance Spill Contingency Plan

This page intentionally left blank.

REGULATORY CROSS-REFERENCE MATRIX

EPA'S CRITERIA FOR STATE, LOCAL AND REGIONAL OIL REMOVAL CONTINGENCY PLANS (40 CFR PART 109)

Regulatory citation(s)		OHS Contingency Plan Section
109.5	Development and implementation criteria for State, local and regional oil removal contingency plans.	
	(a) Definition of the authorities, responsibilities and duties of all persons, organizations or agencies which are to be involved in planning or directing oil removal operations	Sections 1.6, 1.7, 2.3; Appendices A.1, A.3, B.1, G.2, G.3
	(b) Establishment of notification procedures for the purpose of early detection and timely notification of an oil discharge including:	
	(1) The identification of critical water use areas to facilitate the reporting of and response to oil discharges.	Appendices C.1, J.2.6, J.8
	(2) A current list of names, telephone numbers and addresses of the responsible persons (with alternates) and organizations to be notified when an oil discharge is discovered	Sections 1.4, 1.6, 1.7, 1.8, 2.1, 2.5, 2.8; Appendices A.1-A.4
	(3) Provisions for access to a reliable communications system for timely notification of an oil discharge, and the capability for interconnection with the communications systems established under related oil removal contingency plans, particularly State and National plans (e.g., NCP)	Appendices A.6, A.7
	(4) An established, prearranged procedure for requesting assistance during a major disaster or when the situation exceeds the response capability of the State, local or regional authority	Core Plan, Appendices A.3, A.4, A.6
	(c) Provisions to assure that full resource capability is known and can be committed during an oil discharge situation including:	
	(1) The identification and inventory of applicable equipment, materials and supplies which are available locally and regionally	Appendix B
	(2) An estimate of the equipment, materials and supplies which would be required to remove the maximum oil discharge to be anticipated.	Appendix B
	(3) Development of agreements and arrangements in advance of an oil discharge for the acquisition of equipment, materials and supplies to be used in responding to such a discharge	Section 1.6; Appendix B
	(d) Provisions for well-defined and specific actions to be taken after discovery and notification of an oil discharge including:	
	(1) Specification of an oil discharge response operating team consisting of trained, prepared and available operating personnel.	Appendices B.1, G.1, G.2, G.3
	(2) Predesignation of a properly qualified oil discharge response coordinator who is charged with the responsibility and delegated commensurate authority for directing and coordinating response operations and who knows how to request assistance from Federal authorities operating under existing national and regional contingency plans	Section 1.7: Appendices A.1, A.3, G.2
	(3) A preplanned location for an oil discharge response operations center and a reliable communications system for directing the coordinated overall response operations.	Appendix B.1
	(4) Provisions for varying degrees of response effort depending on the severity of the oil discharge	Core Plan, Appendix G
	(5) Specification of the order of priority in which the various water uses are to be protected where more than one water use may be adversely affected as a result of an oil discharge and where response operations may not be adequate to protect all uses	Appendices C.1, J.2.6, J.8
	(e) Specific and well defined procedures to facilitate recovery of damages and enforcement measures as provides for by State and local statutes and ordinances	Appendices J.8, J.9

This page intentionally left blank.

PACIFIC MISSILE RANGE FACILITY
BARKING SANDS
KAUAI, HI

OIL AND HAZARDOUS SUBSTANCE SPILL CONTINGENCY PLAN

June 2022

Prepared By:

PCCI
Marine and Environmental Engineering

300 N. Lee Street, Suite 201
Alexandria, Virginia 22314
703.684.2640

This Page Intentionally Left Blank.

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF FORMS

This Page Intentionally Left Blank.

RECORD OF REVIEW AND UPDATE

Per Chapter 39, Section 3.2, of OPNAV M-5090.1, Oil and Hazardous Substance Spill Contingency Plans shall be reviewed and updated annually. Each plan shall be updated and resubmitted as required by regulations or, at a minimum, every 5 years or after any major spill event.

RECORD OF ANNUAL REVIEW		
Reviewed By	**Date Reviewed**	**Remarks**
Justin Wilson PCCI, Inc.	June 2016	Complete review of all sections (see record of update).
Justin Wilson PCCI, Inc	June 2022	Complete review of all sections (see record of update).

This Page Intentionally Left Blank.

RECORD OF UPDATE				
Change Number	**Page(S) Affected**	**Abstract**	**Date**	**Author's Initials**
1	Whole Plan	General administrative update of the plan. To include (but not limited to): • Names • Phone numbers • Notification and reporting procedures • Response procedures • Response personnel roster • Response equipment inventory • Hazardous substance inventory • Aboveground storage tank inventory • Hazard analysis • Port Allen spill strategies	September 2016	J.W.
2	Appendix K	Created new appendix, "UST Release Response Actions" that addresses the state required response actions for releases from USTs.	August 2020	J.W
2	Table of Contents	Updated table of contents to include new Appendix K.	August 2020	J.W.
3	Whole Plan	General administrative update of the plan. To include (but not limited to): • Names • Phone numbers • Notification and reporting procedures • New notification flowchart • Area of responsibility • Added base map • Response procedures • Response personnel roster • Response equipment inventory • Response contractors • Mutual aid • HS response procedures • Hazardous substance inventory • POL tank inventory (ASTs & USTs) • Hazard analysis • Port Allen spill strategies • New safety data sheets (App. I) • New evacuation appendix • New building POC appendix • New Evacuation Appendix	June 2022	J.W.

RECORD OF UPDATE				
Change Number	Page(S) Affected	Abstract	Date	Author's Initials

ACRONYMS

ACP	Area Contingency Plan
ATSDR	Agency for Toxic Substances and Disease Registry
AOR	Area of Responsibility
AST	Aboveground Storage Tanks
ATG	Automatic Tank Gauging System
BASH	Bird-Aircraft Strike Hazard
BOA	Basic Ordering Agreement
BOS	Base Operating Support
CDO	Command Duty Officer
CFR	Code of Federal Regulations
COMPACFLT	Commander, U.S. Pacific Fleet
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CNO	Chief of Naval Operations
CNRH	Commander Navy Region Hawaii
CO	Commanding Officer
CST	Civil Support Team
DFM	Diesel Fuel Marine
DLA	Defense Logistics Agency
DoD	Department of Defense
DOH	Department of Health
DOT	Department of Transportation
DLA	Defense Logistics Agency
EC	Environmental Coordinator
ECC	Emergency Command Center
ECP	Entry Control Points
EEC	Emergency Evacuation Team
EHS	Extremely Hazardous Substance
EM	Emergency Management
EMI	Emergency Management Institute
EMS	Emergency Medical Services
EMWG	Emergency Management Working Group
EMO	Emergency Management Officer
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
ESI	Environmental Sensitivity Index Map
ETA	Estimated Time of Arrival
EV	Environmental
FEMA	Federal Emergency Management Agency
FOSC	Federal On-Scene Coordinator
FRT	Facility Response Team
HAR	Hawaii Administrative Rules
HAZCOM	Hazard Communication
HAZMAT	Hazardous Material
HAZMIN	Hazardous Waste Minimization
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEER	Hazard Evaluation and Emergency Response
HI	Hawaii

HW	Hazardous Waste
IAP	Incident Action Plan
IC	Incident Commander
ICP	Integrated Contingency Plan
ICS	Incident Command System
IMH	Incident Management Handbook (USCG)
IMT	Incident Management Team
IRFNA	Inhibited Red Fuming Nitric Acid
JIC	Joint Information Center
KEMA	Kauai County Emergency Management Agency
KTF	Kauai Training Facility
LEL	Lower Explosive Limit
LEPC	Local Emergency Planning Committee
MAF	Mixed Amine Fuel
MDSU	Mobile Diving Salvage Unit
MLA	Marine Logistics Agency
MPC	Multi-Purpose Craft
MSDS	Material Safety Data Sheet
MSO	Maritime Support Office
NAVFAC	Naval Facilities Engineering Command
NAVSAFENVTRACEN	Naval Safety and Environmental Training Center
NCP	National Contingency Plan
NEHC	Navy Environmental Health Center
NEX	Navy Exchange
NFESC	Naval Facilities Engineering Service Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRAD	Naval Research and Development
NIMS	National incident Management System
NO	Nitric Oxide
NOSC	Navy On-Scene Coordinator
NTO	Nitrogen Tetroxide
NRC	National Response Center
NRDA	Natural Resources Damage Assessment
NRT	National Response Team
NWCF	Navy Working Capital Fund
NWHI	Northwest Hawaiian Islands
OHS	Oil and Hazardous Substance
OPA 90	Oil Pollution Act of 1990
OPREP	Operational Reports
OPS	Operations
OSHA	Occupational, Safety and Health Administration
OSRO	Oil Spill Response Organization
O&M	Operation & Maintenance
PAO	Public Affairs Officer
PENCO	Pacific Environmental Corporation
PMRF	Pacific Missile Range Facility
POL	Petroleum, Oils, and Lubricants
PPE	Personal Protective Equipment
PREP	Preparedness for Response Exercise Program
RIB	Rigid Inflatable Boat

ROC	Regional Operations Center
RQ	Reportable Quantity
RRT	Regional Response Team
SEPTAR	Seaborne Power Target
SERC	State Emergency Response Commission
SCP	State Contingency Plan
SITREP	Situation Report
SMT	Spill Management Team
SOSC	State On-Scene Coordinator
SPCC	Spill Prevention, Control, and Countermeasure (Plan)
SRT	Spill Response Team
SSC	Scientific Support Coordinator
SSR	Site Summary Report
SUPSALV	Supervisor of Salvage
TCP	Traffic Control Points
TRB	Torpedo Recovery Boat
TSDF	Treatment, Storage, and Disposal Facility
TWR	Torpedo Weapon Retriever
UC	Unified Command
UDMH	Unsymmetrical Dimethylhydrazine
UEL	Upper Explosive Limit
USFWS	United States Fish and Wildlife Service
USCG	United States Coast Guard
UST	Underground Storage Tank

This Page Intentionally Left Blank.

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This Oil and Hazardous Substance Spill Contingency Plan (OHS Plan) serves as a mechanism to ensure that the Pacific Missile Range Facility Barking Sands (PMRF) is adequately prepared to respond to a release of oil or hazardous substances that require an emergency response.

1.2 PLAN FORMAT

This OHS Plan uses the Integrated Contingency Plan (ICP) format developed by the National Response Team (NRT). This format was developed specifically for emergency response plans and is comprised of three parts: the Introduction, Core Plan and Appendices. The Introduction provides information on the purpose, scope, and format of this OHS Plan; including information on the geographic area of responsibility, facility information, and details on the Facility Commander. The Core Plan contains the immediate procedures to be carried out by facility personnel once a discharge is detected or emergency incident is reported. It is designed as a stand-alone document, which can be reproduced and distributed among the various emergency planning and response teams.

The Appendices contain supporting information and reference material required for responding to an OHS discharge. Included are appendices that provide information on; notifications and reporting requirements, response personnel and equipment, hazard analysis, recommended spill actions and cleanup, response strategies for Port Allen, substantial harm certification, response management, exercises, drills, and training, environmental protection, and safety data sheets.

1.3 GEOGRAPHIC AREA OF RESPONSIBILITY

The Area of Responsibility (AOR) for the Commanding Officer, PMRF, encompasses the Base installation and outlying areas including but not limited to the Makaha Ridge, Kamokala Magazines, Port Allen, and Kokee (See Figure 1.1). In the event of a spill that exceeds local response capabilities, the CNRH Navy On-Scene Commander (NOSC) Representative must be notified, and assistance requested.

1.4 PLAN MAINTENANCE AND USE

The master copy of this OHS Plan will be maintained by the Environmental Department at PMRF and the NOSC Representative. For additional information on this OHS Plan please contact:

Mr. Gordon Willson-Naranjo
NAVFAC Hawaii
Pacific Missile Range Facility
Barking Sands, Kauai, 96752-0128
Phone: 335-4942

1.5 GENERAL FACILITY INFORMATION

1.5.1 Mission

The mission of PMRF is to facilitate Training, Tactics Development, and Test & Evaluations for air, surface, and sub-surface weapons systems and Advanced Technology Systems. PMRF provides instrument range support, including; radar, underwater instrumentation, telemetry,

electronic warfare, target remote command & control, communications, target launching facilities, data display, data processing and target/weapon launching and recovery facilities.

1.5.2 Location

The headquarters and primary operation center of PMRF occupies approximately 1800 acres and is located on the western shore of the island of Kauai. The nearest town, Kekaha, is eight miles to the south and east. Supporting instrumentation sites at Makaha Ridge, Kokee, Kamokala Ridge, and Niu Ridge overlook the vast ocean range areas to the west and north Kauai. The range encompasses 42,000 sq. miles of sea and air space and has minimal encroachments. The underwater tracking range extends over a 1000 sq. miles area.

1.6 FACILITY COMMANDER

The Facility Commander has the authority to obligate funds and implement complete emergency response actions at PMRF. The Facility Commander or his Executive Officer shall be notified of any actual or imminent spills, releases, or discharges of oil or hazardous substances from PMRF. Table 1.1 provides information on the Facility Commander and Executive Officer.

TABLE 1-1: FACILITY COMMANDER

Facility Commander	Name	Timothy H. Young
	Position/Title	CAPT, USN Commanding Officer PMRF
	Address	Kauai, HI
	Work Phone	335-4251
	24-Hour Phone	651-6402 (CDO)
Executive Officer	Name	Rich Schmaeling
	Position/Title	CDR, USN, Executive Officer PMRF
	Address	Kauai, HI
	Work Phone	335-4252
	24-Hour Phone	651-6402 (CDO)

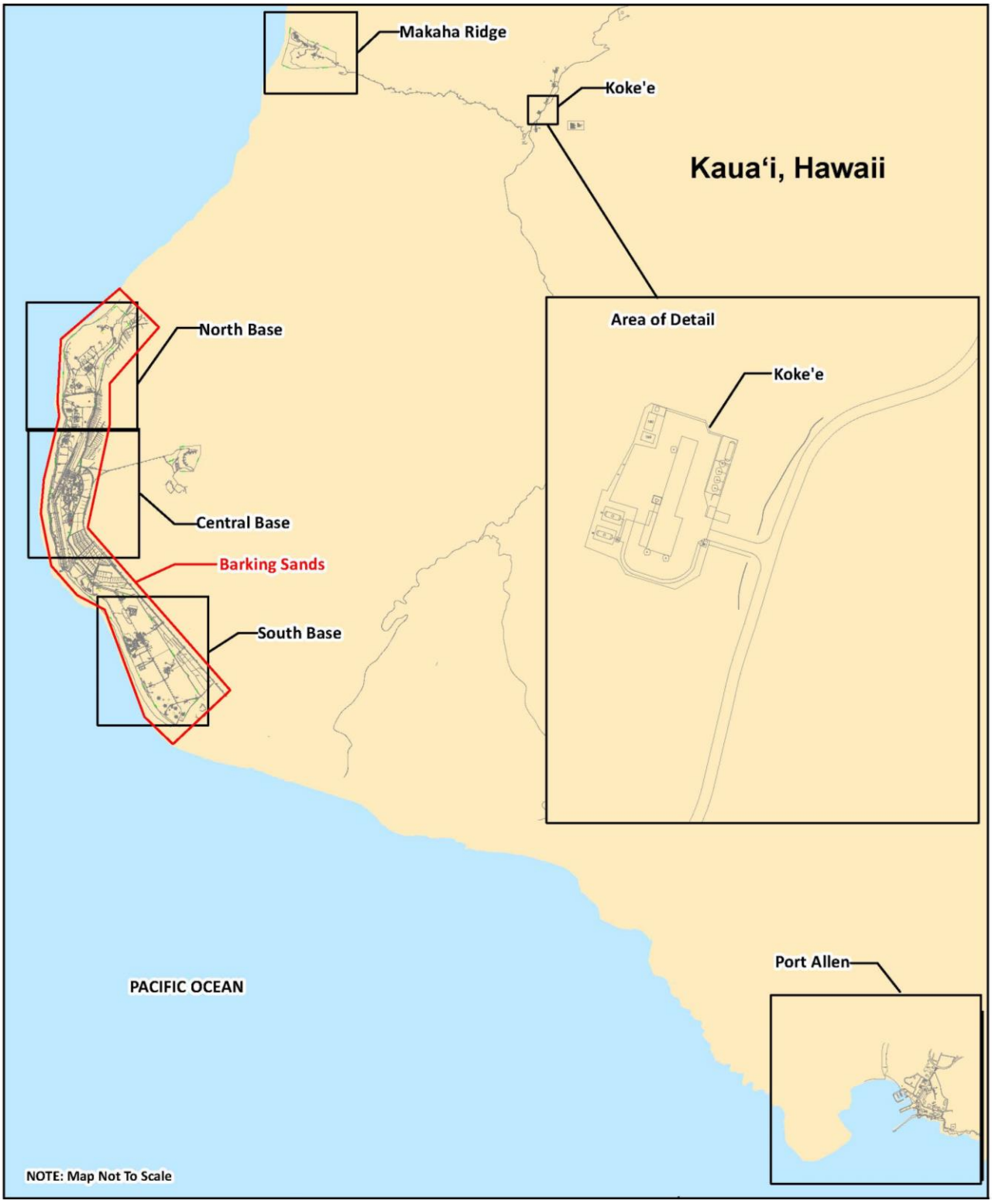
1.7 INCIDENT COMMANDER

The Facility Commander has assigned the role of Incident Commander (IC) to the PMRF Fire Chief. For spills beyond the response capabilities of PMRF the CNRH NOSC Representative will assume the role of Incident Commander. See Appendix A for contact information.

1.8 EMERGENCY NOTIFICATION PHONE LIST

Upon discovery of a spill, facility personnel are to contact Emergency Dispatch (335-4333) who will in turn notify the Fire Department. The Fire Chief, or most senior officer on duty, will assume the duties as the Incident Commander during the emergency phase of the spill. Refer to Appendix A for detailed notification lists, including information on reporting requirements for OHS spills.

FIGURE 1-1: BASE MAP



This Page Intentionally Left Blank.

2.0 CORE PLAN

2.1 OHS SPILL FLOWCHART

This flowchart is for spills that exceed the spiller's capability to safely respond to and clean up. For spills which the spiller has been properly trained to handle and it's safe to do so, follow the building or facility site-specific response plan.

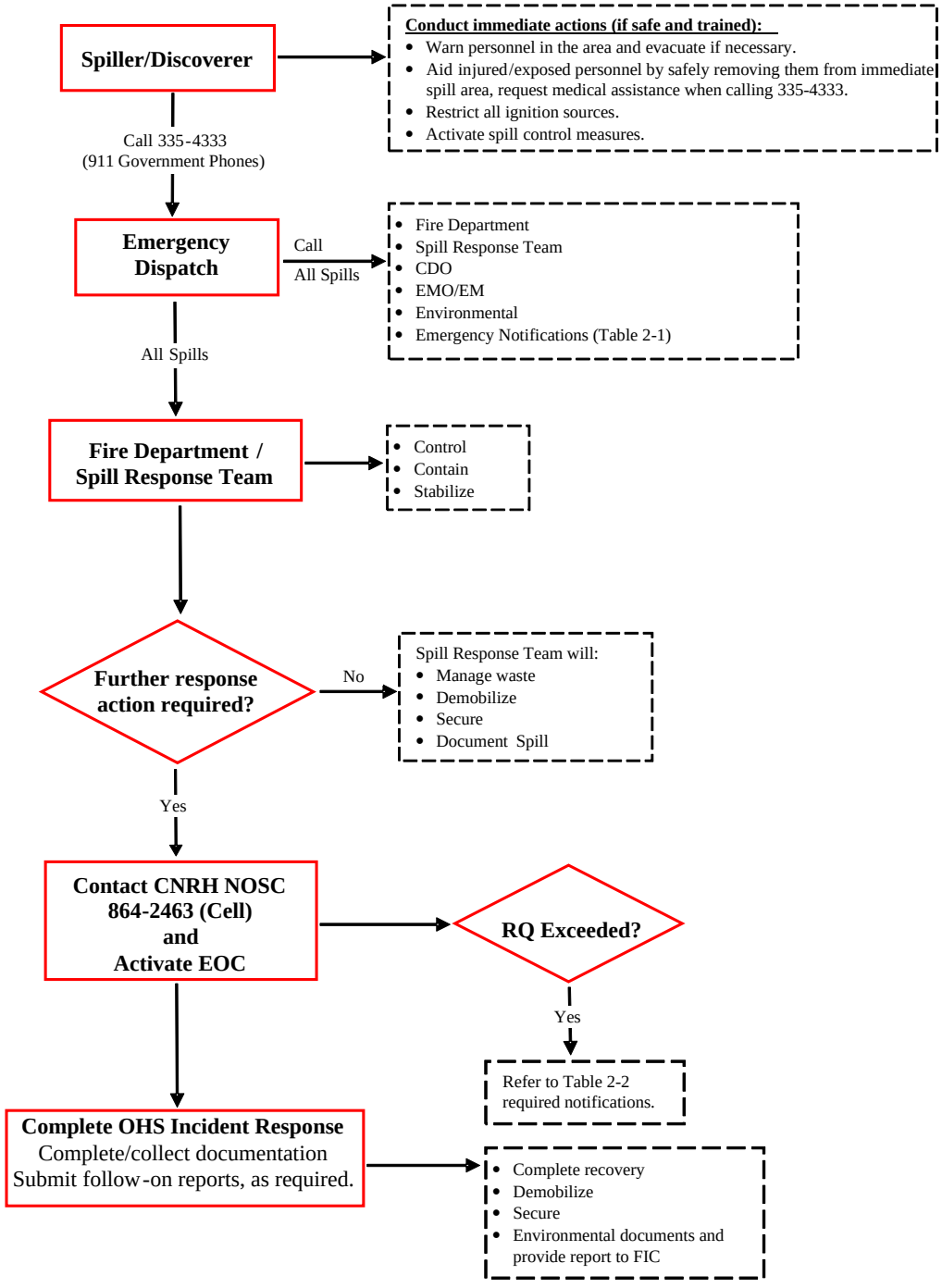


FIGURE 2-1: OIL AND HAZARDOUS SUBSTANCE (OHS) SPILL FLOWCHART

This Page Intentionally Left Blank.

2.2 EMERGENCY NOTIFICATION PHONE LIST

Upon discovery of a spill, facility personnel are to contact Emergency Dispatch (335-4333) who will in turn notify the Fire Department. The Fire Chief or most senior officer on duty will assume the duties as the Incident Commander for the emergency phase of the spill.

Table 2-1, the Emergency Notification List, identifies the names and phone numbers of individuals that may require immediate notification in the event of an OHS spill.

TABLE 2-1: EMERGENCY NOTIFICATION LIST

Name/Organization	Telephone Number*	Notify When
Emergency Dispatch	335-4333 911 (Government Phones)	All Incidents
Commnad Duty Officer	651-6402 (Cell)	All Incidents
Fire Department	335-4333	All Incidents
Fire Chief	335-8288 652-3317 (Cell)	All Incidents
Spill Response Team Coordinator	335-4556, 972-489-5977 (Cell)	All incidents
Environmental Personnel	335-4942/335-4064 541-914-3809 (Cell)	All Incidents
Emergency Management Officer	335-4535 342-9272 (Cell)	All Incidents
NOSC Representative	473-8689 864-2463 (24/7)	When incident exceeds response capabilities of PMRF
Watch Commander	651-3185	All Incidents
PMRF Public Works	335-4213	All Incidents
Fuel Farm	634-0274/635-8750	Fuel Farm/Tank Truck Spills
PMRF Launch/Ordnance	335-4201, (435) 255-2342	Liquid Propellent/Otto Fuel
PMRF Marine Systems Engineer	335-5080 (Port Allen)	Port Allen (Harbor/land) Spills
O&M Marine Systems Supervisor	634-9816	Port Allen (Harbor/land) Spills
Kokee Site	779-4256	Spills at Kokee
Makaha Ridge Site	335-4315	Spills at Makaha Ridge
Public Works Officer	335-4635	As Directed
O&M OSOT Coordinator	335-4119, 482-0029 (Cell)	As Directed
Security	335-4119, 482-0029 (Cell)	As Directed
Project Manager	335-4298, 651-9850 (Cell)	As Directed
Public Affairs	335-4740	As Directed
Emergency Operations Center (EOC)	335-4258	As Directed
Supply Officer/COR	(401) 749-9792 (Cell)	Logistical Support Requirements
Harbor Masters	335-8400 (Port Allen) 241-3110 (Nawiliwili) 335-8400 (Kikiaola)	Reportable spills in harbor

*All phone numbers are a 422 extension from base phones.

This Page Intentionally Left Blank.

2.3 OHS SPILL CHECKLIST

NOTE: The following spill checklist is suggested guidance and is not meant to replace existing checklists, instructions, or operating procedures.

2.3.1 Spiller/Discoverer

☐ If trained and safe to do so, stop the spill

☐ Discontinue operations (if applicable)

- Activate emergency shutdown procedures if safe to do

☐ Warn people in the area of hazards

- Direct personnel to move well clear of the release in an upwind direction

☐ Prevent ignition

- Exclude ignition sources from the area
- Do not start electrical equipment or other engines in area

☐ Spills beyond spiller's capability call:

- Call Emergency Dispatch @ 335-4333 and provide the following:
  - The time and location of the incident
  - Whether there is any injuries to personnel
  - The type and amount of oil or hazardous substance spilled
  - The status of the source
- If the spill is from a bulk storage tank or fuel tank truck call:
  - Fuel Farm @ 335-4477 (Office); 634-0274 (Cell)
  - Supply Officer/COR (401) 749-9792 (Cell)

☐ If the spill meets or exceeds the reportable quantity (RQ), immediately notify:

- Environmental @ 335-4942 (Office); 541-914-3809 (Cell)
- NOSC Rep. @ 864-2463 (24 Hrs.)
- National Response Center (NRC)
  - 800-424-8802 or 202-267-2675 (Direct #)
  - http://www.nrc.uscg.mil
  - Obtain NRC report number for Navy spill message
- State Emergency Response Commission (SERC)
  - 586-4249 (Office)
  - 236-8200 (After-hours)
  - Obtain report number for Navy spill message

- Kauai Local Emergency Planning Committee (LEPC)
  - 241-1800 (Office)
  - 241-1711 (After-hours)

☐ Contain the spill, if trained and safe to do so

☐ Notify facility operator (if applicable)

☐ Provide information to the first responders when they arrive

- Complete Spill Information Log (Form 2-1, Page 2-9)

☐ Within 24 hours, complete and send Navy spill message

☐ Within 30 days, complete and send written follow-up notification to SERC and LEPC with copy to NOSC Rep. and PMRF Environmental

2.3.2 PMRF Fire Department

☐ Assumes role as IC

☐ Site assessment & zone control

- Complete Initial Site Assessment and Safety Plan (Form 2-2, Page 2-11)

☐ Source Control

☐ Air Monitoring

☐ Containment

☐ Contact Spill Response Team for cleanup @ 335-4556 (Office)

2.3.3 PMRF Spill Response Team

☐ Site assessment & zone control

☐ Source Control

☐ Air Monitoring

☐ Containment

☐ Spill Cleanup

☐ DECON

2.3.4 PMRF Marine Department (Oil Spills on Water at Port Allen)

- ☐ Conduct initial site assessment
  - o Complete Initial Site Assessment and Safety Plan (Form 2-2, Page 2-11)
- ☐ Implement booming strategies (see Appendix E)
- ☐ Containment and remove oil
- ☐ Make arrangements to dispose contaminated debris
- ☐ Notify Port Allen Harbor Master @ 335-8400 (office)
- ☐ Ensure spiller conducts proper notification and obtain
  - o NRC report number
  - o SERC report number

2.3.5 Facility Operator (If Applicable)

- ☐ Verify Safety of Personnel
- ☐ Assess the situation
  - o Source and extent of release
  - o Status of operations shutdown
  - o Number of injured and their condition
  - o Probable direction of vapors
  - o Estimate quantity of release
  - o Wind and weather conditions
  - o Direction of movement of the release
  - o Status of ignition sources
- ☐ Notify shift supervisor of the incident
- ☐ Implement site-specific response strategies (if applicable)
  - o Block storm drains
- ☐ Document all actions

2.3.6 NOSC Representative (For Spills Beyond the Capabilities of PMRF)

- ☐ Receive report of the spill
  - o Ascertain nature and severity of spill
- ☐ Activates CNRH Regional Operations Center (ROC)
  - o Recalls ROC Incident Management Team (IMT)

- NOSC Rep. briefs IMT on the status of the incident

☐ Responds to PMRF

☐ Assume role of Incident Commander

☐ Establish command center and staging area

☐ Document all actions

☐ Ensure all required notifications have been made

☐ Submit reports as required

Note: See Appendix A for detailed notification lists.

2.4 SPILL INFORMATION LOG / INITIAL SITE ASSESSMENT AND SAFETY PLAN

This section contains the Spill Information Log (Form 2.1) and the Initial Site Assessment and Safety Plan (Form 2.2). Both forms should be filled out as soon as possible after the initial emergency response actions and notifications have taken place.

FORM 2-1: SPILL INFORMATION LOG		
Section 1 – Initial Release Information		
Spiller:	POC:	
Incident Description:		
Date of Spill:	Time of Spill:	
Spill Location (bldg. no./pier/tank no./etc.):		
Spilled Product:		
Total Amount Spilled (specify units-gals, lbs., etc.):		
How Much On Land:	How Much in Water:	How Much Entering Storm Drain:
Spill Description (size/color/fumes/slick in water/puddle on pavement/etc.):		
Spill Environment: Weather (clear, overcast, partly-cloudy): _____ Prevailing wind at scene: Direction _____ Speed _____ Air Temperature: _____ Tide (high, low, ebb, flood): _____		
Section 2 – Release Information Details		
Source and Cause of Incident:		
Spill Source/Cause:		
Operations(s) Under Way When Spill Occurred:		

FORM 2-1: SPILL INFORMATION LOG	
Response Actions:	
Actions Taken to Stop Release:	
Containment Method Planned/Used:	
Clean-Up Method Planned/Used:	
Parties Performing Spill Containment/Clean-Up: Samples Taken: Yes ____ No_____ Volume of Product Recovered (in gallons):	
Impact/Health Threats:	
Number of Injuries:	Number of Deaths:
Describe Any Evacuations Including Number Evacuated:	
Describe Any Property Damaged:	
Description of Environmental and Health Threats Including Areas Threatened:	
Notifications: NOSC Rep.: Yes ___ No ____ Date: _____ Time: _____ NRC: Yes ___ No ___ Date:_____ Time:_____ Report No._____ SERC: Yes ___ No ___ Date:_____ Time:_____ Report No._____ LEPC: Yes ___ No ___ Date:_____ Time:_____ **Other Notification:** Department/Command/Agency Date Time Phone POC	

FORM 2-2: INITIAL SITE ASSESSMENT AND SAFETY PLAN

Initial Site Assessment		
Date and Time:	Name of Initial Incident Commander:	
Wind Direction	□ Toward your position □ Away from your position	
Are people injured/endangered?	YES	NO
Are there persons requiring rescue?	YES	NO
Is the incident scene secure?	YES	NO
Is the evacuation of nearby areas required?	YES	NO

Initial Hazard Assessment			
Are there any signs of potential hazards from:	Electrical lines down or overhead or buried gas or electrical lines	YES	NO
	Hazardous liquids or solids	YES	NO
	Visible or suspected vapors	YES	NO
	Unusual smells or odors	YES	NO
	Fire/explosions (Flammable vapors or dusts, fire or sparks from nearby ignition sources)	YES	NO
	Falling Objects	YES	NO
	Difficult Access or Egress	YES	NO
	Manholes, pits, stairways, caverns, deep ditches, cliffs, unsafe structures or other fall hazards present	YES	NO
	Local vehicular or pedestrian traffic	YES	NO

Describe any labels, warning placards, color coded placards, or danger signs present at the spill site:	
Describe the spill location and its topography (such as rocky, cliff or bluff, sandy beach, docks, wetlands, paved area, inside building, inside pit or trench, confined space, etc.):	
List any potentially hazardous weather/environmental conditions (wet surfaces, high winds, cold, heat):	
List any other special site hazards (noise, bees/hornets, poison plants, thorns/nettles, biological infectious hazards, dust/sand or cut/abrasion/puncture wound hazards):	
Make an initial assessment of the flammability of vapors and the level of oxygen present.	% LEL: %O:

FORM 2-2: INITIAL SITE ASSESSMENT AND SAFETY PLAN

Additional Support/Equipment	
Evaluate need for additional support/equipment.	Security:
	Special Support (Air OPS, EOD, etc.):
	Hazardous Materials Technicians/Specialists (identification/monitoring/source control):
	Regional Spill Response Support:
	Equipment Needed to Control Spill:
	Other:

Material Hazard Assessment

Information on spilled material – attach additional sheets if more than one material is present at spill site:

CHEMICAL NAME: OTHER NAME(S):

ID NUMBERS (UN OR CAS): DOT HAZARD CLASS:

SOLID ( ) LIQUID ( ) GAS ( ) MIXTURE ( ) QUANTITY SPILLED

MATERIAL SOURCE: DRUM ( ) PIPE ( ) TANK ( ) BOX ( ) VESSEL ( ) A/C ( ) OTHER

	NO	YES	UNK	COMMENTS
Spill Source Secured?				
SDS? (Attach copy)				
Fire Or Explosion Hazard?				LEL ___ UEL ___ (obtain from SDS)
Reactivity Hazard?				Note if water reactive. Note any other incompatible materials.
Inhalation Hazard?				Established exposure limit (i.e. PEL, TLV, STEL, IDHL) (note type of exposure limit and units):
Skin/Dermal Hazard?				
Other Special Hazards?				Note type of hazard:

FORM 2-2: INITIAL SITE ASSESSMENT AND SAFETY PLAN

Personnel Protection

Indicate if air monitoring/sampling is required and describe type of monitoring program:

Indicate PPE required for each response zone:

Zone/Crew	Level of Protection	Description (type of respiratory protection, gloves, protective clothing, etc.)

Indicate decontamination procedures to be used:

Other precautions:

UPDATE AND COMMENTS

Note any comments or changes here. For changes, also note the item number that changed and the time of change:

This Page Intentionally Left Blank.

2.5 SPILLER NOTIFICATION CHECK-OFF LIST

If you are the spiller of an OHS spill which equals or exceeds the regulatory reportable quantity:

- Complete the notifications in the Spiller Notification Check-Off List (Table 2-2) below. Provide copy to the NOSC Representative.

TABLE 2-2: SPILLER NOTIFICATION CHECK-OFF LIST

CONTACT	PHONE NO.	NOTIFIED
NOSC Representative	473-4689 (Office) 864-2463 (24-Hrs.)	Person Notified: _____ Date / Time Notified: _____
National Response Center (NRC)	800-424-8802 (24-Hrs.) 202-267-2675 (Direct #)	Person Notified _____ Date / Time Notified: _____ Report No: _____
Hawaii State Emergency Response Commission (HSERC) Provide follow-up written notification within 30 days of initial notification, see Appendix A.	586-4249 (Office) 236-8200 (After-hours) 586-7537 (Fax)	Person Notified: _____ Date Notified: _____ Time Notified: _____ Report No.: _____
Kauai Local Emergency Planning Committee (LEPC) Provide follow-up written notification within 30 days of initial notification, see Appendix A.	241-1800 (Office) 241-1711 (After-hours) 241-1860 (Fax)	Person Notified: _____ Date / Time Notified: _____ Report No. (as applicable): _____
Provide follow-up navy message within 24-hours of discovery	See Appendix A	See Appendix A

This Page Intentionally Left Blank.

2.6 LIQUID PROPELLANTS SPILL CHECKLIST

The following are emergency procedure specifically for a propellant spill. A propellant spill for the purposes of these procedures will be defined as free, uncontained liquid propellant. A minor spill is less than one pound, approximately one pint. A major spill will be more than one pound of propellant or a spill which poses an immediate threat to personal safety outside a 50-foot radius. Do not attempt these emergency procedures unless you are trained to respond.

2.6.1 In Case Of a Propellant Spill

☐ IMMEDIATELY REPORT spill to the EMERGENCY COORDINATOR listed below:

Title	Telephone
Launch Ordnance Officer	335-4201 or (435) 255-2342 (Cell)
Ordnance Safety Specialist	335-4119
Ordnance Supervisor	335- 4373

☐ IF NO CONTACT is made, REPORT SPILL IMMEDIATELY to:

Emergency Dispatch	335-4333

☐ KEEP IGNITION SOURCES AWAY from the spill area

2.6.2 Minor Spills (Less than one pound, approximately one pint).

☐ Use full splash gear including gloves, goggles, and boots and the “buddy system” then approach the spill from upwind

☐ Use appropriate fuel or oxidizer Interscan toxic vapor monitor (or equivalent) to detect the presence of any toxic vapors. If toxic vapors are detected, spill response personnel should use full face respirators supplied with breathing air. Threshold limit value for immediate hazard to unprotected personnel is 0.5 ppm for Unsymmetrical Dimethylhydrazine (UDMH) or 1.0 ppm of NO_2 for Nitrogen Tetroxide (NTO) at a point no more than 50 feet downwind from the spill. See Appendix I for the Safety Data Sheets (SDSs) for UDMH and NTO.

☐ If possible, determine the cause of the spill and stop further spillage

☐ Place catch pans/buckets and dike spill with absorbent socks or diatomaceous earth to contain the spill as necessary. Prevent runoff into streams or sewers. Prevent any contact between fuel and oxidizer with dikes or any other appropriate method.

☐ Dilute spilled propellant with water to reduce the flammability hazard and the emission of toxic vapors

☐ Absorb spill with proper absorbent material and place absorbent and other contaminated disposables into separate fuel and oxidizer contaminated material drums. Double bag contaminated tools to be decontaminated later.

2.6.3 Major Spills (More than one pound of propellant or a spill which poses an immediate threat to personal safety outside a 50-foot radius)

☐ The PMRF Safety Officer must determine wind speed and direction and alert and evacuate personnel in downwind areas, on-site and off-site, as required.

☐ Should anyone in the immediate vicinity be unable to evacuate due to a suspected propellant vapor cloud between them and the escape path, they should seek shelter upwind of the spill and contact the Emergency Dispatch 335-4333 as quickly as possible.

☐ As soon as possible, the names of any persons who cannot be accounted for must be reported to the PMRF Safety Officer who will direct efforts to locate them.

☐ Notify the emergency response personnel of the nature and location of the spill

☐ EMERGENCY RESPONSE PERSONNEL SHOULD AUTOMATICALLY REPORT TO THE LAUNCH OPERATIONS BUILDING UNLESS DIRECTED OTHERWISE

☐ KEEP IGNITION SOURCES AWAY from the spill area and any downwind areas that may have propellant vapors

☐ Use full splash gear including gloves, goggles, boots and full face respirator and the “buddy system” then approach the spill from upwind

☐ As the spill is approached, use the appropriate fuel or oxidizer Interscan toxic vapor monitor (or equivalent) to detect the presence of any toxic vapors. If toxic vapor concentrations above the threshold limit value (UDMH – 0.5ppm, NTO measured as NO2 – 1.0 ppm) at a point no more than 50 feet downwind from the spill is detected, or if propellant is continuing to leak or spill, spill response personnel should don the ILC Dover Chemturion protective suit (or equivalent). See Appendix I for the SDSs for UDMH and NTO.

☐ As soon as possible, apply a water spray to the spill from as far away as practical. The spray will dilute the propellant to reduce the flammability hazard and toxic vapor emissions.

☐ If possible, determine the cause of the spill and stop further spillage

☐ Place catch pans/buckets and dike spill with absorbent socks or diatomaceous earth to contain the spill as necessary. Prevent runoff into streams, storm drains or sewers. Prevent any contact between fuel and oxidizer with dikes or any other appropriate method.

☐ Absorb spill with proper absorbent material and place absorbent and other contaminated disposables into drums. If the quantity is large, 5-25 gallons, use the appropriate fuel or oxidizer aspirator to vacuum up the spill. Double bag contaminated tools to be decontaminated later.

2.6.4 Special Instructions

- The diluted/neutralized propellant must be prevented from running off into storm drains, sewers, streams, and other areas by building dikes with absorbent and/or inert materials or spill pillows
- Do not mix fuel and oxidizer brushes or other decontamination tools. ALL SUCH ITEMS MUST BE COLOR CODED – RED FOR UDMH AND GREEN FOR OXIDIXERS
- Fuel and oxidizer contaminated materials will not be decontaminated in the decontamination areas at the same time to prevent any possibility of spontaneous combustion

This Page Intentionally Left Blank.

2.7 EMERGENCY RESPONSE PROCEDURES FOR FUEL RELATED FACILITIES

This section describes the emergency response procedures to be taken for oil spills or the threat of oil spills from fuel related facilities at PMRF. Emergency response procedures for hazardous substances are discussed in Appendix D, Section D.3.

These emergency procedures are for the most likely spill scenarios and cover the following:

NOTE: The following response procedures are suggested guidance for the most likely emergency spill scenarios and are not meant to replace existing checklists, instructions, or operating procedures.

This Page Intentionally Left Blank.

2.7.1 Immediate Actions for Day Tank Overfill

During Transfers

- ☐ Shut down pump
- ☐ Slowly close dispensing valve to stop fuel flow into tank, AFTER SHUTTING OFF PUMP
- ☐ If spill is into containment ensure containment discharge outlet is closed. Verify containment of spill within secondary containment
- ☐ Secure all sources of ignition and spill area
- ☐ If spill escapes secondary containment, or spill is not into secondary containment use sorbent pads, sheets or rolls to contain spill
- ☐ Cover or block storm water drains and sewer manholes or block drainage ditches as necessary
- ☐ Notify Emergency Dispatch @ 335-4333

This Page Intentionally Left Blank.

2.7.2 Immediate Actions for Day Tank or Associated Component Failure

During Transfers

- ☐ Shut down pump
- ☐ If spill is into containment ensure containment discharge outlet is closed. Verify containment of spill within secondary containment
- ☐ If spill escapes secondary containment, or spill is not into secondary containment, use sorbent pads, sheets or rolls to contain spill
- ☐ Cover or block storm water drains and sewer manholes or block drainage ditches as necessary
- ☐ Secure all sources of ignition and spill area
- ☐ If possible and safe to accomplish, close tank's flow control valves
- ☐ If the failure involves the tank, depending on the extent and location of the failure, consider pumping oil from the damaged tank to another tank to reduce spill magnitude and draw down the oil level below the failure point to stop discharge
- ☐ Notify Emergency Dispatch @ 335-4333

Under Static Conditions

- ☐ If spill is into containment, ensure containment discharge outlet is closed
- ☐ Verify containment of spill within secondary containment
- ☐ Secure all sources of ignition and spill area
- ☐ If spill escapes secondary containment, or spill is not into secondary containment, use sorbent pads, sheets or rolls to contain spill
- ☐ Cover or block storm water drains and sewer manholes or block drainage ditches as necessary
- ☐ Depending on the extent and location of the failure if it involves the tank, consider pumping oil from the damaged tank to other tanks to reduce spill magnitude and draw down the oil level below the failure point to stop discharge
- ☐ Notify Emergency Dispatch @ 335-4333

This Page Intentionally Left Blank.

2.7.3 Immediate Actions for Equipment Failures

Pump Failure

- ☐ Shut down pump
- ☐ Slowly close aligned valves, after shutting off pump, to stop transfer operation
- ☐ Secure ignition sources and spill area
- ☐ Slowly close flow control/block valves to isolate pumping equipment
- ☐ Verify spill containment in the pump sump
- ☐ Contain spill outside of containment with sorbent pads, sheets or rolls
- ☐ Notify Fuel Farm @ 335-4477 (Control Room)
- ☐ Notify Emergency Dispatch @ 335-4333

Pumping Equipment Leaks

- ☐ If unable to stop leak with available means, switch to backup pump
- ☐ If unable to bypass affected equipment, shut down pump
- ☐ Slowly close working storage and receiving tanks flow control valves, after shutting off pump, to stop transfer operation
- ☐ Slowly close flow control/block valves to isolate leaking pumping equipment
- ☐ If effective, use drip pans or other containers to collect spill
- ☐ If necessary, use sorbents to further contain and collect spill
- ☐ Contain spill outside of containment with sorbent pads, sheets or rolls
- ☐ Notify Fuel Farm @ 335-4477 (Control Room)
- ☐ Notify Emergency Dispatch @ 335-4333

Relief Valve Failure during Transfers

- ☐ Shut down transfer pump
- ☐ Slowly close nearest block or flow control valves to isolate failed relief valve, after shutting off pump
- ☐ Secure all sources of ignition and spill area
- ☐ If spill is into a containment system, verify closure of containment drainage valve or ensure drain is blocked

- ☐ If spill is onto open ground, cover or block storm drains and sewer manholes or block drainage ditches as necessary
- ☐ Use available containers to collect spill if feasible
- ☐ Contain spill outside of containment with sorbent pads, sheets or rolls
- ☐ If feasible, use a portable pump and holding tank to reduce affected pipe section pressure
- ☐ Notify Fuel Farm @ 335-4477 (Control Room)
- ☐ Notify Emergency Dispatch @ 335-4333

Relief Valve Failure during Static Conditions

- ☐ Secure all sources of ignition and spill area
- ☐ Cover or block storm drains and sewer manholes or block drainage ditches as necessary
- ☐ Verify closure of nearest flow control/block valves and isolation of leaking section of piping
- ☐ If feasible, use a portable pump and holding tank to reduce affected pipe section pressure to atmospheric pressure
- ☐ Contain spill outside of containment with sorbent pads, sheets or rolls
- ☐ Notify Fuel Farm @ 335-4477 (Control Room)
- ☐ Notify Emergency Dispatch @ 335-4333

Flow Control Valves, Flanges and Other Equipment Failure

- ☐ Stop leak where possible (e.g., by tightening bolts)
- ☐ If spill occurs during a transfer operation, shut off pumps and then slowly close nearest block or flow control valves to isolate affected equipment
- ☐ If spill occurs during static conditions, verify closure of nearest flow control/block valves and isolation of affected equipment
- ☐ Secure all sources of ignition and spill area
- ☐ Cover or block storm drains and sewer manholes or block drainage ditches as necessary
- ☐ If effective, use drip pans or other containment equipment to contain and collect the spill
- ☐ Contain spill outside of containment with sorbent pads, sheets or rolls
- ☐ Notify Fuel Farm @ 335-4477 (Control Room)
- ☐ Notify Emergency Dispatch @ 335-4333

2.7.4 Immediate Actions for Piping Failure

During Transfers

- ☐ Notify pump operator or Fuel Control Room (@ 335-4477) to cease pumping
- ☐ If spill is into a containment system, verify closure of containment drainage valve and spill containment within the secondary containment system
- ☐ If failure occurs at a piping location outside containment, cover or block storm water drains and sewer manholes or block drainage ditches as necessary
- ☐ Secure all sources of ignition and spill area
- ☐ Slowly close nearest flow control/block valve to isolate the ruptured section of piping
- ☐ Use available containers to collect spill from piping if feasible
- ☐ Contain spill outside of containment with sorbent pads, sheets or rolls
- ☐ Notify Fuel Farm @ 335-4477 (Control Room)
- ☐ Notify Emergency Dispatch @ 335-4333

Under Static Conditions

- ☐ If spill is into a containment system, verify closure of containment drainage valve and spill containment within the secondary containment system
- ☐ If failure occurs at a piping location outside containment, cover or block storm water drains and sewer manholes or block drainage ditches as necessary
- ☐ Secure all sources of ignition and spill area
- ☐ Verify closure of nearest block or flow control valves to isolate failed section of piping
- ☐ Use available containers to collect spill from piping if feasible
- ☐ Contain spill outside of containment with sorbent pads, sheets or rolls
- ☐ Notify Fuel Farm @ 335-4477 (Control Room)
- ☐ Notify Emergency Dispatch @ 335-4333

This Page Intentionally Left Blank.

2.7.5 Immediate Actions for Tank Truck Overfill

During Transfers

- ☐ Shutoff pump
- ☐ Release deadman valve to stop fuel flow into truck, AFTER SHUTTING OFF PUMP
- ☐ Secure all sources of ignition and the spill area
- ☐ Cover or block storm water drains and sewer manholes or block drainage ditches as necessary if spill is outside curbed containment
- ☐ DO NOT START truck until the spill has been removed
- ☐ Contain spill with sorbent pads, sheet or rolls
- ☐ Notify Fuel Farm @ 335-4477 (Control Room)
- ☐ Notify Emergency Dispatch @ 335-4333

2.7.6 Immediate Actions for Tank Truck or Fill Stand Component Failure

During Transfers

- ☐ Shutdown pump
- ☐ Release deadman valve to stop fuel flow into truck, AFTER SHUTTING OFF PUMP
- ☐ Slowly close appropriate flow control/block valves to stop fuel flow to fill stand and isolate failed component
- ☐ Secure all sources of ignition and the spill area
- ☐ Shutoff containment drainage valve discharging to the oil/water separator and open drainage valve to transfer facility containment holding tank
- ☐ Cover or block storm water drains and sewer manholes or block drainage ditches as necessary if spill is outside containment
- ☐ DO NOT START truck until spill has been removed
- ☐ If possible, use drip pans or other containment equipment to contain and collect the spill
- ☐ Contain spill outside of containment with sorbent pads, sheets or rolls
- ☐ Notify Fuel Farm @ 335-4477 (Control Room)
- ☐ Notify Emergency Dispatch @ 335-4333

This Page Intentionally Left Blank.

2.7.7 Immediate Actions for Explosions or Fires

- ☐ Activate fire alarm; call Emergency Dispatch @ 335-4333
- ☐ Provide Fire Department with required information (e.g. Safety Data Sheets); notify immediately after securing flow and ignition sources
- ☐ If incident occurs at the Fuel Farm, notify Fuel Farm @ 335-4477 to shut off power to facility and close valves
- ☐ If electrical fire is involved, shut off electrical power
- ☐ If incident occurs during a transfer operation, notify pump operator to shut off pumping equipment and close nearest block or flow control valves
- ☐ Evacuate to a safe distance and account for personnel if necessary
- ☐ Secure area, stay upwind and keep out of low areas
- ☐ Remove or secure other sources of ignition if possible and safe to accomplish
- ☐ Remove incompatible and flammable materials if possible and safe to accomplish
- ☐ Use fire extinguishers if trained to use and it is safe and appropriate

This Page Intentionally Left Blank.

2.8 FUEL DEPARTMENT EMERGENCY RECALL BILL

The following is taken from PMRFINST 10340.1B, Fuel Operations Manual.

2.8.1 Emergencies at the Fuel Farm

For emergencies at the Fuel Farm use the Recall Bill in Table 2-3, if the person recalled cannot be notified, call the next person on the Recall Bill. Note, that for any fuel spill at the Fuel Farm, Emergency Dispatch must be called @ 335-4333.

TABLE 2-3: FUEL DEPARTMENT EMERGENCY RECALL BILL

NAME	CELL	WORK PHONE
William Chamlee, Supply Officer/COR	(401) 749-9792	-
Summer Malina, Koa Lani Supply Manager	652-3630	335-4755
Keneze Lazaro, Fuels Operations, Lead Person	634-0274	335-4477
Donovan Badingan, Fuels Operators, Lead Person	635-8750	335-4477
Aaran Foster, Fuels Operator	635-6150	335-4477
Desmond Alao, Fuels Operator	639-5161	335-4477

2.8.2 High Level Alarms or Separator Alarms

Contact the below personnel in the following order:

1. William Chamlee @ (401) 749-9792 (Cell)
2. Supply Duty BPR @ 652-3630
3. Security @ 335-4523 (will contact Keneze Lazaro)

2.8.3 Power Outages

For power outages at the Fuel Farm contact the CDO @ 651-6402 (Cell)

This Page Intentionally Left Blank.

APPENDIX A
NOTIFICATIONS AND REPORTING REQUIREMENTS

A.1 FACILITY COMMANDER

The Facility Commander has the authority to obligate funds and implement complete emergency response actions at PMRF. The Facility Commander or his Executive Officer shall be notified of any actual or imminent spill, release, or discharge of Oil or Hazardous Substances (OHS) from PMRF. Table A.1 provides information on the Facility Commander and Executive Officer.

TABLE A-1: FACILITY COMMANDER

Facility Commander	Name	Timothy H. Young
	Position/Title	CAPT, USN Commanding Officer PMRF
	Address	Kauai, HI, 96752-0128
	Work Phone	335-4251
	24-Hour Phone	651-6402 (CDO)
Executive Officer	Name	Rich Schmaeling
	Position/Title	CDR, USN, Executive Officer PMRF
	Address	Kauai, HI, 96752-0128
	Work Phone	335-4252
	24-Hour Phone	651-6402 (CDO)

A.2 INCIDENT COMMANDER

The Facility Commander has assigned the role of Incident Commander to the PMRF Fire Chief.

Fire Chief
PMRF Barking Sands Fire & Emergency Services
Building 300, Ola Ka Moi Road,
Kekaha, HI 96752
Office: 335-8288; Cell: 652-3317; 24-Hrs. 335-4333

A.3 NAVY ON-SCENE COORDINATOR (NOSC)

In the event of an OHS spill that exceeds the response capabilities of PMRF, the CNRH NOSC Representative must be notified, and assistance requested.

CNRH NOSC Representative
NAVFAC HI, Code EV13
Building X-1, 400 Marshall Road
JBPHH, HI 96860-3114
Phone: 473-4689; Cell: 864-2463 (24/7)

Note: All numbers listed are area code 808 unless otherwise noted.

A.4 EMERGENCY NOTIFICATION PHONE LIST

Upon discovery of a spill, facility personnel are to contact Emergency Dispatch (335-4333) who will in turn notify the Fire Department. The Fire Chief or most senior officer on duty will assume the duties as the Incident Commander for the emergency phase of the spill.

Table A-2, the Emergency Notification List, identifies the names and phone numbers of individuals that may require immediate notification in the event of an OHS spill.

TABLE A-2: EMERGENCY NOTIFICATION LIST

Name/Organization	Telephone Number*	Notify When
Emergency Dispatch	335-4333 911 (Government Phones)	All Incidents
Command Duty Officer	651-6402 (Cell)	All Incidents
Fire Department	335-4333	All Incidents
Fire Chief	335-8288 652-3317 (Cell)	All Incidents
Spill Response Team Coordinator	335-4556, 972-489-5977 (Cell)	All incidents
Environmental Personnel	335-4942/335-4064 541-914-3809 (Cell)	All Incidents
Emergency Management Officer	335-4535 342-9272 (Cell)	All Incidents
NOSC Representative	473-8689 864-2463 (24/7)	When incident exceeds response capabilities of PMRF
Watch Commander	651-3185	All Incidents
PMRF Public Works	335-4213	All Incidents
Fuel Farm	634-0274/635-8750	Fuel Farm/Tank Truck Spills
PMRF Launch/Ordnance	335-4201, (435) 255-2342 (Cell)	Liquid Propellent/Otto Fuel
PMRF Marine Systems Engineer	335-5080 (Port Allen)	Port Allen (Harbor/land) Spills
O&M Marine Systems Supervisor	634-9816	Port Allen (Harbor/land) Spills
Kokee Site	779-4256	Spills at Kokee
Makaha Ridge Site	335-4315	Spills at Makaha Ridge
Public Works Officer	335-4635	As Directed
O&M OSOT Coordinator	335-4119, 482-0029 (Cell)	As Directed
Security	335-4119, 482-0029 (Cell)	As Directed
Project Manager	335-4298, 651-9850 (Cell)	As Directed
Public Affairs	335-4740	As Directed
Emergency Operations Center (EOC)	335-4258	As Directed
Harbor Master	335-8400 (Port Allen) 241-3110 (Nawiliwili) 335-8400 (Kikiaola)	Reportable spills in the harbor
Supply Officer/COR	(401) 749-9792 (Cell)	Logistical Support Requirements

*All phone numbers are a 422 extension from base phones.

A.5 PMRF BUILDINGS POINTS OF CONTACT

Appendix M provides the emergency point of contact and phone number for every building within the main base and outlying areas, including Makaha Ridge, Kamokala Magazines, Port Allen, and Kokee.

A.6 EXTERNAL AGENCY NOTIFICATIONS

Table A-3 provides a list of outside agencies that may need to be contacted in an emergency or for technical guidance.

TABLE A-3: EXTERNAL AGENCY NOTIFICATION LIST

Agencies to Notify	Action	Telephone Number
National Response Center (NRC)	If NRC has not been notified, notify immediately. (See Section A.6.2)	800-424-8802 202-267-2675 (Direct)
Hawaii State Emergency Response Commission (HSERC)	Notify within 30 minutes of discovery for OHS releases under EPCRA and CERCLA. (See Section A.6.5)	586-4249 (Office) 236-8200 (After-hours) 586-7537 (Fax)
Kauai Local Emergency Planning Commiittee (LEPC)	Notify within 30 minutes of discovery for OHS releases under EPCRA and CERCLA. (See Section A.6.5)	241-1800 (Office) 241-1711 (After-hours) 241-1860 (Fax)
County of Kauai Emergency Management Agency	County Emergency Management Department.	241-1800 241-1860 (Fax)
Kauai County Fire Department	Contact for mutual aid assistance.	241-4975 (Fire Chief)
U.S. Coast Guard (USCG) Sector Honolulu	In the event the NOSC Rep. cannot be contacted, notify the USCG Sector Honolulu.	842-2600
USCG District 14 Command Center	Assistance and resources.	800-331-6176
EPA Region 9	Contact for assistance with environmental emergencies.	415-947-8000 (Office) 800-300-2193 (24-Hrs.)
Hawaiian Islands National Wildlife Refuge	Contact if wildlife, wetlands, or refuges are threatened or impacted.	792-9548
U.S. Fish and Wildlife Service, Pacific Island Office	Notify if Federal natural resources are threatened or impacted.	792-9400
NOAA - Scientific Support Coordinator	For advice on scientific issues, communicate with scienitific community, coordinate State and Federal agency requests for specific study assistance and assist On-Scene Coordinator with spill movements and trajectories.	206-849-9926
NOAA National Marine Fisheries Service - Pacific Island Regional Office	Notify if protected marine species are threatened or impacted. Notify as a natural resources trustee and to assist in spill response if turtles are injured.	725-5000 725-5215 (Fax)
Agency for Toxic Substances and Disease Registry	Health information related to the toxicity, chemistry, and decontamination of harzardous materials.	800-232-4636
Hawaii Poison Control Center	Provides toxological information and medical treatment advice for responders.	800-222-1222 (24-Hrs.)
Oceania Regional Response Team	Notify if public health emergency exists, or may occur.	619-806-6737 (EPA)
NOAA Weather Service	Weather and water conditions and forecasts.	973-5286 (24-Hrs.)
FEMA - Pacific Area Office	If incident presents or may present a MAJOR disaster.	851-7900

A.7 REGULATORY NOTIFICATIONS

There are Federal and State regulatory requirements to report a discharge or substantial threat of a discharge of OHS. It is very important that discharges be promptly reported to all relevant Federal and State authorities.

A.7.1 Reportable Oil and Hazardous Substance Discharges

Reportable discharges are defined as any oil discharged to the water that meets the requirements of 40 CFR 110.3 [i.e. a discharge or a substantial threat of a discharge that violates applicable water quality standards or cause a film or sheen upon or discoloration of the surface of the navigable water (as defined in 40 CFR 110.1) or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the navigable water or upon adjoining shorelines]. Reportable hazardous substances releases are defined as any release of a hazardous substance (as identified in 40 CFR 302) that exceeds the reportable quantity within any 24-hour period.

A.7.2 NRC Notification

Reportable OHS releases must be immediately reported to the NRC. Although present regulations do not establish or quantify the reporting time, it is the policy of CNRH that, whenever possible, all spills or releases will be reported to the NRC no later than 15 minutes after discovery.

24-hour: (800) 424-8802
Direct: (202) 267-2675

IMPORTANT: Do *not* wait to collect details on the spill before calling the NRC. Call the NRC as soon as a reportable spill occurs. Call back the NRC (reference the NRC Report Number) and provide any additional details if applicable.

A.7.3 Reporting Information for Extremely Hazardous Substances

As per the Emergency Planning and Community Right to Know Act (EPCRA), if the hazardous substance release includes an “extremely hazardous substance” and the release can potentially result in exposure to persons outside the boundary of the facility, follow the procedures found in Section A.6.5 to provide the notifications required by 40 CFR 355.40 to the HSERC and the Kauai LEPC.

A.7.4 Reporting Information for Hazardous Waste

If the substance released is a hazardous waste, also include the following information required by 40 CFR 264.56(d)(2):

- Name and telephone number of the reporter
- Name, address, and US EPA Generator ID Number of the facility
- Type and time of incident (i.e. release, fire, etc.)
- Name and quantity of materials involved, to the extent known
- Extent of injuries if any
- Possible hazards to human health, or the environment, outside the facility

A.7.5 State of Hawaii Hazardous Substance Release Notification Requirements

A.7.5.1 Overview of Requirements

In Hawaii, owners or operators of facilities or vessels reporting releases of hazardous substances are subject to state notification requirements under the following state statutes and administrative rules:

- Chapter 128D, Hawaii Revised Statutes, the Environmental Response Law

- Chapter 128E, Hawaii Revised Statutes, the Hawaii Emergency Planning and Community Right-to-Know Act (HEPCRA)
- Title 11, Chapter 451, Hawaii Administrative Rules (HAR), the State Contingency Plan (SCP)

A.7.5.2 Reportable Quantities

PMRF must immediately notify the HSERC (through the Hazard Evaluation and Emergency Response (HEER) Office) and the Kauai LEPC if there is a release into the environment of a hazardous substance that is equal to or exceeds the minimum reportable quantity in any 24-hour period as set forth in the regulations.

Covered Types of Chemicals and Quantities Include:

- Extremely Hazardous Substances are those substances and quantities listed at 40 CFR part 355, Appendices A and B.
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) hazardous substances contained in 40 CFR part 302, Table 302.4.
  - Facilities must also report a release of a CERCLA hazardous substance to the NRC at (800) 424 8802.
- Trichloropropane
  - Reportable quantity is 10 pounds as per HAR 11-451-6(b).
- Oil [under the following circumstances]:
  - Any amount of oil which when released into the environment causes a sheen to appear on surface water, or any navigable water of the state.
  - Any free product that appears on ground water.
  - Any amount of oil released to the environment greater than 25 gallons.
  - Any amount of oil released to the environment, which is less than 25 gallons, but which is not contained and remediated within 72 hours.
- An unlisted substance designated under HAR Section 11-451-5(c), in quantities equal to or exceeding the reportable quantity criteria in Section 11-451-6(c).
- Reportable Quantities List
  - A list of reportable hazardous substance release quantities (sorted by chemical name) is provided in Appendix 2-D of the online Technical Guidance Manual.
- For releases of unknown quantities, report if lab results exceed the most restrictive Environmental Action Levels for residential use.

A.7.5.3 Verbal Notifications via Telephone

Numbers to Call:

- HEER Office as the administrative contact for the HSERC **586-4249** (7:45am – 4:30pm Monday to Friday) or **236-8200** (After-hours which includes weekends, holidays and after 4:30 weekdays).
- Kauai LEPC at **241-1800** (Office); **241-1711** (After-hours).
- NOTE: Please call **911** if there is an immediate threat to human welfare or fatalities.

Note: An exception from immediate notification is provided for releases of oil of less than 25 gallons in any 24-hour period which is not contained and remedied within 72 hours. Such releases must be reported in written form only within 30 days of the discovery of the release.

Provide the following information to the extent known at the time of the notice so long as no delay in responding to the emergency results. It is expected that notification occur **within 20 minutes** of discovery of the release. (Do not delay due to incomplete notification information related to the release):

1. Name and telephone number of the caller.
2. Name and telephone number of a contact person, (if different from the caller) that can provide timely information as the incident is occurring.
3. Name (trade and chemical), of the hazardous substance which has been released.
4. Approximate quantity of the hazardous substance which has been released.
5. Location of the incident.
6. Date and time of spill, release, or threatened release.
7. Description of what happened (source and cause of the release).
8. Immediate danger or threat posed by the release.
9. Name, address, and telephone number of the responsible party or potentially responsible party.
10. Measures taken or proposed to be taken in response to the release as of the time of the notification.
11. Any known injuries or advice regarding medical attention necessary for exposed individuals.
12. The names and phone numbers of other federal, state, or local government agencies that have been notified of the release.
13. Any other information that may help emergency personnel respond to the incident.

Once the information has been provided, the caller will be provided with a HEER Incident Case Number, which shall be referenced in any future correspondence including the written notification submittal.

A.7.5.4 Written Follow-Up Notification

In addition to the verbal notification, a Hazardous Substances Written Follow-Up Notification Form regarding the release is required to be sent to the HSERC/HEER and Kauai LEPC, postmarked no later than 30 days after the initial discovery of the release. The follow-up notification form should include all the information provided in the verbal notification described above and any other pertinent information not previously provided. The notification form can be sent by certified mail, faxed, hand-delivered, or another means which provides proof of delivery. See Table A-4 for the applicable mailing addresses and fax numbers. Photos should be included to document the incident. An example of the notification form is provided on the following pages.

The notification form can also be submitted online at the below HEER Office website (prior registration at Hawaii DOH e-permitting is required). Alternatively, a mail-in version of the notification form (fillable PDF) can be downloaded at the same website.

https://eha-cloud.doh.hawaii.gov/epermit/app/#/formversion/358b2c6d-8736-49a6-ba1a-6b13aea51eda

TABLE A-4: HAZARDOUS SUBSTANCE RELEASE CONTACT LIST		
Contact	**Address**	**Phone Number**
HSERC State of Hawaii Hazard Evaluation and Emergency Response Office	Attn: EPCRA Data Manager 2385 Waimano Home Road #100 Pearl City, Hawaii 96782	586-4249 (Office) 236-8200 (After-hours) 586-7537 (Fax)
Kauai LEPC Kauai Emergency Management Agency	3990 Kaana Street, Suite 100 Lihue, Hawaii 96766	241-1800 (Office) 241-1711 (After-hours) 241-1860 (Fax)
Kauai LEPC Alternate (After Hours) Kauai County Fire Department		241-4975 (Fire Chief) 911 (24-Hrs.) 241-6508 (Fax)

FORM A-1: HAWAII HAZARDOUS SUBSTANCE WRITTEN FOLLOW-UP NOTIFICATION FORM

Incident Case No.: _____

Contact Information

Caller's Information

Name: _____

Address: _____

City: _____ State _____ Zip _____

Telephone number: _____

Owner's Information

Name: _____

Title: _____

Company: _____

Address: _____

City: _____ State _____ Zip _____

Telephone number: _____

Operator's Information

Name: _____

Title: _____

Company: _____

Address: _____

City: _____ State _____ Zip _____

Telephone number: _____

Name of a contact person at the facility or vessel where the release has occurred: _____

_____

Telephone number: _____

Hazardous Substance Released:

Name (trade and chemical) of the hazardous substance which has been released: _____

_____

Chemical Abstract Service (CAS) Number (if applicable):_____

Approximate quantity of the hazardous substance released: _____

Incident Information

Location of the release:_____

_____

A brief description of the release: _____

_____

Media into which the release occurred or is likely to occur (Indicate all those that apply):

☐ Air ☐ Soil ☐ Groundwater ☐ Concrete ☐ Asphalt ☐ Stream ☐ Ocean ☐ Other

Cause of the release: _____

_____

Date of the release: _____

Time of the release: _____

Duration of the release: _____

Date: _____

Time that the person in charge of the facility or vessel where the release occurred obtained knowledge of the release: _____

Source of the release: _____

_____

Response Information

Response measures taken thus far: _____

_____

Any appropriate information relating to the ability of the owner or operator of the facility or vessel where the release has occurred to pay for or perform any proposed or required response actions: _____

_____

_____

The names of other federal, state, or local government agencies that have been notified of the release: _____

_____

Health Information

Known or anticipated acute health risks: _____

_____

Known or anticipated chronic health risks: _____

_____

Advice regarding medical attention necessary for exposed individuals: _____

_____

Potential impacts to public health or welfare: _____

_____

Potential impacts to the environment: _____

_____

"I certify under penalty of law that I have personally examined and am familiar with the information submitted and believe the submitted info is true, accurate, and complete."

Signature: _____ Date: _____

Printed Name: _____

Title: _____

Company: _____

A.7.6 Regulatory Notification Checklist

Table A-5 provides a checklist for regulatory notifications.

TABLE A-5: REGULATORY NOTIFICATION CHECKLIST

Contact	Phone No.	Notified
NRC Note: That it is the policy of CNRH that, whenever possible, all spills or releases will be reported to the NRC no later than 15 minutes after discovery.	800-424-8802 (24-Hrs.) 202-267-2675 (Direct #)	Person Notified _____ Date / Time Notified: _____ Report No. : _____
HSERC/HEER Office Note: Provide follow-up written notification within 30 days of initial notification. (See Section A.6.5.4 for details)	586-4249 (Office) 236-8200 (After-hours) 586-7537 (Fax)	Person Notified: _____ Date / Time Notified: _____ Report No. : _____
Kauai LEPC Note: Provide follow-up written notification within 30 days of initial notification. (See Section A.6.5.4 for details)	241-1800 (Office) 241-1711 (After-hours) 241-1860 (Fax)	Person Notified: _____ Date / Time Notified: _____ Report No. : _____

A.8 NAVY REPORTING REQUIREMENTS

Table A-6 lists the Navy reports and messages that need to be made for reportable OHS discharges.

TABLE A-6: NAVY REPORTING REQUIREMENTS

Report/Message	Destination	Deadlines
Navy Oil Spill Report	To: CNO Per OPNAVINST 5090.1.C	Within 24 hours of the discovery of an oil discharge or substantial threat of a discharge.
Navy Hazardous Substance Release Report	To: CNO Per OPNAVINST 5090.1.C	Within 24 hours of the discovery of an HS release or substantial threat of a release.
Navy Chain of Command Special Incident Reporting: OPREP-3 Navy Blue	To: CNO Per OPNAVINST 5090.1.C Per OPNAVINST 5090.1.C For spills that represent environmentally significant events or have the potential to cause adverse public reaction shall immediately be reported using the OPREP system (see OPNAVINST 3100.6(series) for instructions).	Flash Voice Report immediately to Fleet Command Center (no later than 5 minutes after knowledge of incident.) Message within 20 minutes of voice report with follow-up message reports as necessary.

A.8.1 Navy Oil and Hazardous Substance Spill Reports

Figures A-1 (Oil Spill Report Message Format) and A-2 (Hazardous Substance Report Message Format) are report formats to be used for reporting Oil discharges and HS releases, respectively. Example messages are given for both oil (Figure A-3) and hazardous substance (Figure A-4). Table A-7 provides a list of spill cause descriptions that should be used when classifying the cause of an oil spill when submitting a Navy Oil Spill Report.

A.8.2 OPREP-3 Reporting

In accordance with OPNAVINST 3100.6(series), any pollution incident involving oil, gasoline, jet fuel, or a hazardous substance that results from a catastrophic event, or is subject to unusual media scrutiny, or attracts high level U.S. Navy interest, shall be reported immediately on an OPREP-3 Special Incident Report. A sample OPREP-3 message report is provided in Figure A-5

FIGURE A-1: OIL SPILL REPORT (MESSAGE FORMAT)

1. **Precedence (for messages only):** Provided that prior voice reports have been made both to the US Coast Guard National Response Center and the reporting command's Chain of Command, use "Routine" precedence for Oil Spill Report Messages. If either voice report has not been made, use "Priority" precedence.

2. **Classification or Special Handling Marks:** Oil Spill Report Messages are unclassified and do not warrant special handling marks unless classified or sensitive business information must be incorporated. Avoid inclusion of such information to the maximum extent possible to allow Oil Spill Report Messages to be handled on a solely unclassified basis.

3. **Spill Volume Classification:** To better advise the Navy On-Scene Coordinator and Navy leadership of the magnitude of each oil spill, the Subject line of an Oil Spill Report Message should bear a volume estimate of the spill, if known, in the following format:

   - OIL SPILL REPORT, X GALLONS, [ACTIVITY NAME] (MINIMIZE CONSIDERED); or
   - OIL SPILL REPORT, UNKNOWN VOLUME, [ACTIVITY NAME] (MINIMIZE CONSIDERED); or
   - OIL SPILL REPORT, SHEEN SIGHTING (MINIMIZE CONSIDERED).

4. **Updating Oil Spill Report Messages:** Oil Spill Report Messages should be updated with a follow-up SITREP message as soon as the reporting activity becomes aware of new information concerning the origin, quantity, type, operation under way or cause of the spill. Similarly, *if the final estimate of the amount spilled differs substantially from the amount initially reported,* the reporting activity must send a SITREP update message to all action and info addresses on the original spill message.

5. **Action and Info Addressees:**

FM: NAVY ACTIVITY OR SHIP RESPONSIBLE FOR OR DISCOVERING THE SPILL
TO: COMNAVREG HI//N00/N01/N4 //
CHAIN OF COMMAND
INFO: CNO WASHINGTON DC//N45//
CHINFO WASHINGTON DC//
COMPACFLT PEARL HARBOR HI//N3/N5/N01CE//
JBPHH HI//N00/N01//
USPACOM CAMPSMITH HI//J4/J44// (for significant spills)
COMNAVSEASYSCOM WASHINGTON DC//00C//
COMCOGARD SECTOR HONOLULU HI//
COGARD NATIONAL RESPONSE CENTER WASHINGTON DC//
NFESC PORT HUENEME CA//424//
NOLSC DC FT BELVOIR VA//
NAVY JAG WASHINGTON DC//11//
CNIC WASHINGTON DC//N45//
NAVSURFWARCENSHPSYSENST PHILADELPHIA//923//

6. Body of Report: Use the following format for the body of all Oil Spill Report Messages:

UNCLAS//NO5090//
SUBJ: OIL SPILL REPORT, X GALLONS, [ACTIVITY NAME] (MINIMIZE CONSIDERED) or
OIL SPILL REPORT, UNKNOWN VOLUME, [ACTIVITY NAME] (MINIMIZE CONSIDERED) or
OIL SPILL SHEEN SIGHTING, (MINIMIZE CONSIDERED)
MSGID/GENADMIN/ORIGINATOR//
RMKS/

1. LOCAL TIME AND DATE SPILL [OCCURRED/DISCOVERED].

2. [FACILITY/VESSEL] ORIGINATING SPILL:
   - For Navy ships list ship name and hull number.
   - For Navy shore facilities list the facility name.
   - For non-Navy spills, list name of responsible party, if known.
   - For organizations under contract to Navy, list firm name and contracting Navy activity.
   - If source UNKNOWN at time of this report, list only "Unknown" until such time as definitively established.

3. SPILL LOCATION:
   - For spills at sea, list latitude, longitude, and distance to nearest land.
   - For spills in port, list port name, host naval command (PMRF) and specific location (pier or mooring designation).
   - For spills ashore, list city, state, facility name, and specific location (building designation).

4. VOLUME SPILLED <u>IN GALLONS</u>:
   - Estimates must be made by examining loss at source: i.e. sounding tank, calculating flow rate of spill.
   - If amount unknown at time of this report, list only "Unknown" until such time as definitively established.
   - Estimating volume by visual observation of oil on water can be very unreliable.
   - If volume estimate can only be made by visual observation of oil on water, do not report estimate here.
   - If oil/water mixture, indicate percent oil.

5. TYPE OF OIL SPILLED:
   - List whether diesel fuel marine (DFM); naval distillate; jet fuel (JP-8); aviation/automotive gasoline; automotive diesel; heating fuels (grade 1 or 2, kerosene); residual burner fuel (grade 4, 5 or 6); lubricating oil; hydraulic oil; oil/oil mixture (including slops and waste oil); oil/water mixture (including bilge waste).
   - If type unknown at time of this report, list only "Unknown" until such time as definitively established.

6. OPERATION UNDER WAY WHEN SPILL [OCCURRED/DISCOVERED]:
   - If fueling/defueling, list whether underway or in port by pipeline, truck, or barge.

- Whether conducting internal fuel oil transfer operations (including movement from one storage tank to another); pumping bilges; conducting salvage operations; aircraft operations; or “Other” (specify).
- If operation unknown at time of this report, list only “Unknown” until such time as definitively established.

7. SPILL CAUSE:
   - Classify the cause of the spill. This information will be used by NAVSEA for causal analysis and spill prevention.
   - If cause unknown at time of this report, list only “Unknown” until such time as definitively established.
   - Note: see Table A-7, cause codes and supplemental information for assistance classifying the spill cause

8. SLICK DESCRIPTION AND MOVEMENT:
   - Size: length and width (yards or nm) and percentage of that area covered.
   - Color: silver transparent, gray, rainbow, blue, dull brown, dark brown, black, brown-orange mousse.
   - Odor: noxious, light, undetectable.
   - Slick movement: set (degrees true toward) and drift (knots).

9. SPILL ENVIRONMENT:
   - Weather: clear, overcast, partly-cloudy, rain, snow, etc.
   - Prevailing wind at scene: direction (degrees true from), speed (knots), fetch (yards or nautical miles).
   - Air and water temperature: indicate ice cover.
   - Sea state: Beaufort Force number.
   - Tide: high, low, ebb, flood, or slack/Current: set (degrees true toward) and drift (knots).

10. AREAS DAMAGED OR THREATENED:
    - Body of water, area or resources threatened or affected.
    - Nature and extent of damage to property, wildlife, or other natural resources (if any).

11. TELEPHONIC REPORT TO NATIONAL RESPONSE CENTER [WAS/WAS NOT] MADE:
    If made, list:
    - Time and Date of telephonic report.
    - NRC report/case number.
    - Name of NRC official taking report.
    - If not made, provide reason why: beyond 12 nm from US shores, no threat to navigable water, etc.
    - Navy Command making telephonic report.
    - SERC report number.

12. SAMPLES [WERE/WERE NOT] TAKEN:
    - If taken, identify location(s) from which taken (e.g. tanks, hoses, piping, slip, jetty, etc.)
    - If taken, identify collecting officer by name, rank, and agency.

13. CONTAINMENT METHOD [PLANNED/USED]:
    - If none, state reason.
    - Otherwise, indicate equipment utilized: boom; ship's hull; camel; water spray; chemical agent.

14. SPILL REMOVAL METHOD [PLANNED/USED]:
    - If none, state reason.
    - Equipment planned/used: used: Skimmer; portable skimmer; absorbent materials (oil absorbent pads, chips, etc.); dispersants; vacuum trucks/pumps; other (specify).

15. VOLUME OF OIL RECOVERED IN GALLONS: (Decanted pure product.)

16. PARTIES PERFORMING SPILL REMOVAL:
    - Identify lead organization in charge: Navy Command; USCG; EPA.
    - Identify all other parties involved: commercial firms; supporting Navy activities; State or local agencies.
    - Clean-up costs.

17. FEDERAL, STATE OR LOCAL REGULATORY ACTIVITY DURING THIS INCIDENT:
    - Identify by name and agency any official attending on-scene or making telephonic inquiry.
    - Note whether officials boarded vessel and include date, time and spaces inspected.

18. ASSISTANCE REQUIRED/ADDITIONAL COMMENTS:

19. LESSONS LEARNED: How could this spill have been avoided?

20. ACTIVITY CONTACT FOR ADDITIONAL INFORMATION: List name, rank/rate, command, code, DSN and/or commercial telephone numbers. //

21. COST OF RECOVERY: Probably not known for initial report. Include in follow up report to the extent known.

FIGURE A-2: HAZARDOUS SUBSTANCE SPILL REPORT (MESSAGE FORMAT)

1. Precedence (for messages only): Provided that prior voice reports have been made to the US Coast Guard National Response Center and the reporting command's Chain of Command, use "Routine Precedence" for Hazardous Substance Release Report Messages not classified as an "Extremely Hazardous Substance." If either voice report has not been made, use "Priority Precedence." If Extremely Hazardous Substance, always use "Priority Precedence."

2. Classification or Special Handling Marks: HS Release Report Messages are unclassified and do not warrant special handling marks unless classified or sensitive business information must be incorporated. Avoid inclusion of such information to the maximum extent possible to allow HS Release Report Messages to be handled on a solely unclassified basis.

3. Correcting HS Release Report Messages: HS Release Report Messages should be updated with a follow-up SITREP Message as soon as the reporting activity becomes aware of new information concerning the origin, amount, nature of substance, type of operation at source or cause of release. Similarly, *if the final estimate of the amount released differs substantially from the amount initially reported,* the reporting activity must send a SITREP update message to all action and info addresses on the original message.

4. Action and Info Addressees:

FM: NAVY ACTIVITY OR SHIP RESPONSIBLE FOR OR DISCOVERING THE SPILL
TO: COMNAVREG HI//N00/N01/N4//
CHAIN OF COMMAND
INFO: CNO WASHINGTON DC//N45//
CHINFO WASHINGTON DC//
COMPACFLT PEARL HARBOR HI//N3/N5/N01CE//
JBPHH HI//N00/N01//
USPACOM CAMPSMITH HI//J4/J44// (FOR SIGNIFICANT SPILLS)
COMNAVSEASYSCOM WASHINGTON DC//00C//
COMCOGARD SECTOR HONOLULU HI
COGARD NATIONAL RESPONSE CENTER WASHINGTON DC//
NFESC PORT HUENEME CA//424//
NAVY JAG WASHINGTON DC//11//
CNIC WASHINGTON DC//N45//

5. Body of Report: Use the following format for the body of all HS Release Report Messages:

UNCLAS//N05090//
SUBJ: HAZARDOUS SUBSTANCE RELEASE REPORT (REPORT SYMBOL OPNAV 5090-3) (MIN: CONSIDERED)
MSGID/GENADMIN/ORIGINATOR//
RMKS/

1. LOCAL TIME AND DATE RELEASE [OCCURRED/DISCOVERED]:

2. [FACILITY/VESSEL] ORIGINATING RELEASE:
   - For Navy ships, list ship name and hull number.

- For Navy shore facilities list the facility name.
- For release occurring during transportation, list name of activity responsible for shipment.
- For non-Navy spills, list name of responsible party, if known.
- For organizations under contract to Navy, list firm name and contracting Navy activity.
- If source UNKNOWN at time of this report, list only "Unknown" until such time as definitively established.

3. RELEASE LOCATION:
   - For release at sea, list latitude, longitude, and distance to nearest land.
   - For release in port, list port name, host naval command (PMRF) and specific location.
   - For release ashore, list city, state, facility name and specific location (building designation).
   - For release during transportation, give exact location (highway mile marker or street number and city).

4. AMOUNT RELEASED:
   - Use convenient units of weight or volume (kg, lb., gallons, liters, etc.).
   - For continuous release, estimate rate of release and amount left in container.
   - Estimates should be made by examining loss at source: sounding tank, calculating flow rate of spill.
   - *Unreliable estimates of volume using visual observation of HS on water may not be reported here.*
   - If amount unknown at time of this report, *list only "Unknown"* until such time as definitively established.

5. HAZARDOUS SUBSTANCE RELEASED:
   - If Extremely Hazardous Substance, headline this paragraph "EXTREMELY HAZARDOUS SUBSTANCE RELEASED:"
   - Consult container labels, user directions, reference books, expert advice.
   - Provide chemical/product names, formula, synonym, physical/chemical characteristics, and inherent hazards.
   - "Container label identifies substance as acrylonitrile. Synonyms: cyansethylene, vintleyanide. Characteristics/hazards: poisonous liquid and vapor, skin irritant, highly reactive/flammable."
   - Describe appearance, physical/chemical characteristics, actual/potential hazards observed. For example:
   - "Substance released is colorless to light yellow unidentified liquid; highly irritating to eyes and nose; smells like kernels of peach pits; vaporizing quickly, posing ignition problem."

6. TYPE OF OPERATION AT SOURCE: Plating shop, painting shop, hazardous waste (HW) facility, truck, ship, pipeline, ship rebuilding, entomology shop, etc.

7. CAUSE OF RELEASE:
   - Provide narrative description of specific cause of release.
   - Account for personnel error, equipment failure, etc. directly contributing to release.
   - For example: "Railing supporting 55-gal drums on a flatbed truck gave way because it was not securely fastened, causing seven drums to fall and rupture."
   - If cause unknown at time of this report, *list only "Unknown"* until such time as definitively established.

8. TYPE OF CONTAINER FROM WHICH SUBSTANCE ESCAPED:
   - 55-gal drums, 5-lb. bags, tank truck, storage tank, can, etc.
   - Estimate number of containers damaged or dangerously exposed.

9. RELEASE ENVIRONMENT:
   - Describe scene of release.
   - Include information on physical characteristics, size and complexity of release and weather conditions.
   - For Example: "Solvent released formed shallow pool covering area about 30 ft. by 45 ft. of bare concrete. Solvent slowly running into storm drain. Pool emitting highly toxic, flammable vapors. Dark clouds threatening rain. Light wind drifting vapors northbound to residential area about 30 ft. above ground."

10. AREAS DAMAGED OR THREATENED:
   - Describe actual and potential danger or damage to surrounding environment,
   - Identify body of water, area or resources threatened or affected.
   - Nature and extent of damage to property, wildlife, or other natural resources (if any).

11. NOTIFICATIONS MADE AND ASSISTANCE REQUESTED:
   - List all organizations informed of release within and beyond Navy jurisdiction.
   - Include Navy, federal, state, and local authorities, response teams, fire departments, hospitals, etc.
   - Specify type of assistance requested from these organizations.
   - If telephonic report to National Response Center made, list: DTG of telephonic report; NRC report/case number; name of NRC official taking report; and Navy Command making telephonic report.

12. FIELD TESTING:
   - Indicate findings and conclusions as to concentration, pH, etc.

13. CONTROL AND CONTAINMENT ACTIONS [PLANNED /TAKEN]:
   - If none, explain why.
   - Specify method used to control and contain release.
   - For example: "Gas barriers used to control and contain vapor emissions. Runoff contained by excavating ditch circumscribing affected area."

14. CLEAN-UP ACTIONS [PLANNED /TAKEN]:
   - If none, explain why.
   - Identify on-site or off-site treatment, method used, parties involved in clean-up/removal and disposal area.
   - For example: "No clean-up action taken. Toxic vapors present, potential danger to clean-up crew. Contaminated soil will be excavated and shipped by NAS personnel to Class I HW disposal site in Portstown, CA when conditions allow."

15. AMOUNT OF SUBSTANCE RECOVERED [VOLUME/WEIGHT] (Pure product.):

16. PARTIES PERFORMING [CONTAINMENT/CLEAN-UP] ACTIVITIES:
   - Identify lead organization in charge: Navy Command; USCG; EPA.
   - Identify all other parties involved: commercial firms; supporting Navy activities; State or local agencies.

17. FEDERAL, STATE OR LOCAL REGULATORY ACTIVITY DURING THIS INCIDENT:
    - Identify by name and agency any regulatory official attending on-scene or making telephonic inquiry.
    - Note whether officials boarded vessel and include date, time and spaces inspected.

18. ASSISTANCE REQUIRED/ADDITIONAL COMMENTS.

19. LESSONS LEARNED: How could this release have been avoided?

20. ACTIVITY CONTACT FOR ADDITIONAL INFORMATION: List name, rank/rate, command, code, DSN and/or commercial telephone numbers.//

FIGURE A-3: OIL SPILL REPORT MESSAGE (SAMPLE)

UNCLASSIFIED
FM USS NEVERSAIL (Vessel originating spill)
TO COMNAVREG HAWAII HI//N00/N01/N4//
INFO CNO WASHINGTON DC//N45//
CHINFO WASHINGTON DC//
COMPACFLT PEARL HARBOR HI//N3/N5/N01CE//
JBPHH HI//N00/N01//
USPACOM CAMPSMITH HI//J4/J44// (for significant spills)
COMNAVSEASYSCOM WASHINGTON DC//00C25//
COMCOGARD SECTOR HONOLULU HI
COGARD NATIONAL RESPONSE CENTER WASHINGTON DC//
NAVFAC EXWC PORT HUENEME CA//424//
NOLSC DC FT BELVOIR VA//
NAVY JAG WASHINGTON DC//11//
CNIC WASHINGTON DC//N45//
(Vessel ISIC or TYCOM)
UNCLAS//N05090//
SUBJ/OIL SPILL REPORT, 25 GALS, USS NEVERSAIL//
MSGIF/GENADMIN/USS NEVERSAIL //
RMKS/

1. LOCAL TIME AND DATE SPILL OCCURRED/DISCOVERED: 11/09/03, 0930

2. FACILITY/VESSEL ORIGINATING SPILL: USS NEVERSAIL, LST 1234, UIC 66666

3. SPILL LOCATION: JBPHH HI PIER BRAVO 12

4. VOLUME SPILLED IN GALLONS: 25

5. TYPE OF OIL SPILLED: DIESEL FUEL

6. OPERATIONS UNDER WAY WHEN SPILL OCCURRED/DISCOVERED: INBOARD FUEL TRANSFER

7. SPILL CAUSE: FUEL OIL SUSPECTED TO HAVE ORIGINATED FROM THE TOP OF FUEL STORAGE EXPANSION TANK.

8. SLICK DESCRIPTION AND MOVEMENT: LARGE SHEEN 30FT BY 120FT, MOVING SW

9. SPILL ENVIRONMENT: CLEAR, WINDS 045, 15 KTS GUSTING TO 20 KTS, AIR TEMP 83F

10. AREA DAMAGED OR THREATENED: NONE

11. TELEPHONIC REPORT TO NATIONAL RESPONSE CENTER MADE: NRC CASE # 14658, on 08/09/2001 at 0840; HAWAII STATE EMERGENCY RESPONSE COMMISSION WAS MADE. CASE # 2000 0905-1212, REPORT MADE BY USS NEVERSAIL.

12. SAMPLES TAKEN: NONE

13. CONTAINMENT METHOD: CONTAINED IN TYPE 2 BOOM

14. SPILL REMOVAL METHOD: ABSORBENT MATERIAL AND 1 WILLARD SKIMMER

15. VOLUME OF PRODUCT RECOVERED IN GALLONS: 15 GALS

16. PARTIES PERFORMING SPILL REMOVAL: JBPHH FRT

17. FEDERAL, STATE OR LOCAL REGULATORY ACTIVITY DURING THIS INCIDENT: TELEPHONIC INQUIRY BY LT DAN NORTON, MSO HONOLULU

18. ASSISTANCE REQUIRED/ADDITIONAL COMMENTS: SPILL CLEANUP COMPLETED ON 9 NOV 03 BY 1630.

19. LESSONS LEARNED: CAUSE STILL UNDER INVESTIGATION

20. ACTIVITY CONTACT FOR ADDITIONAL INFORMATION: LCDR DAVEY JONES, USS NEVERSAIL, COM 808/476-7890//

BT

FIGURE A-4: HAZARDOUS SUBSTANCE SPILL REPORT MESSAGE (SAMPLE)

UNCLASSIFIED

FM XYZ PEARL HARBOR HI//09//
TO COMNAVREG HAWAII HI//N00/N01/N4//
INFO CNO WASHINGTON DC//N45//
CHINFO WASHINGTON DC//
COMPACFLT PEARL HARBOR HI//N3/N5/N01CE//
JBPHH HI//N00/N01//
USPACOM CAMPSMITH HI//J4/J44// (for significant spills)
COMNAVSEASYSCOM WASHINGTON DC//00C//
COMCOGARD SECTOR HONOLULU HI
COGARD NATIONAL RESPONSE CENTER WASHINGTON DC//
NAVFAC EXWC PORT HUENEME CA//424//
NAVY JAG WASHINGTON DC//11//
CNIC WASHINGTON DC//N45//
UNCLAS//NO5090//
SUBJ/HAZARDOUS SUBSTANCE RELEASE REPORT/PEARL HARBOR HI//
REF/A/DOC/OPNAVINST 5090.1B//
RMKS/

1. LOCAL TIME AND DATE RELEASE: 8/09/01, 0831

2. ACTIVITY ORIGINATING RELEASE: XYZ PEARL HARBOR

3. RELEASE LOCATION: BUILDING 553

4. AMOUNT RELEASED: 5 GALLONS

5. HAZARDOUS SUBSTANCE RELEASED: 2, ETHYL/BUTANOL

6. TYPE OF OPERATION AT SOURCE: WAREHOUSE/STORAGE

7. CAUSE OF RELEASE: CONTAINERS NOT SEALED PRIOR TO PACKING

8. TYPE OF CONTAINER FROM WHICH SUBSTANCE ESCAPED: 5 GALLON CAN

9. RELEASE ENVIRONMENT: MAJORITY OF SPILL WAS INSIDE TRANSPORT TRAILER, LESS THAN A GALLON WENT INTO THE PARKING LOT.

10. AREAS DAMAGED OR THREATENED: NONE

11. NOTIFICATIONS MADE AND ASSISTANCE REQUESTED: NO ADDITIONAL ASSISTANCE REQUIRED. NATIONAL RESPONSE CENTER NOTIFIED 8/09/01, 0840; CONTROL #004507, HAWAII STATE EMERGENCY RESPONSE COMMISSION NOTIFIED; CASE # 2000-0905-1212.

12. FIELD TESTING: NONE

13. CONTROL AND CONTAINMENT ACTIONS (PLANNED/TAKEN): SPEEDY-DRY USED TO CONTAIN AND RECOVER SPILL.

14. CLEAN-UP ACTIONS (PLANNED/TAKEN): THE TRAILER IS TO BE DECONTAMINATED & STEAM CLEANED.

15. AMOUNT OF SUBSTANCE RECOVERED (VOLUME/WEIGHT): 5 GALLONS

16. PARTIES PERFORMING (CONTAINMENT/CLEAN-UP) ACTIVITIES: NAVFAC HI HAWAII AND FEDERAL FIRE DEPARTMENT

17. FEDERAL, STATE, OR LOCAL REGULATORY ACTIVITY DURING INCIDENT: NONE

18. ASSISTANCE REQUIRED/ADDITIONAL COMMENTS: NONE

19. LESSONS LEARNED: CHECK ALL CONTAINERS CLOSELY PRIOR TO PACKING. DDNV TO DO FOLLOW-UP INVESTIGATION.

20. ACTIVITY CONTACT FOR ADDITIONAL INFORMATION: LCDR DAVEY JONES XYZ PEARL HARBOR; COM 808-476-7890//
BT

FIGURE A-5: OPREP- 3 NAVY BLUE MESSAGE REPORT (SAMPLE)

FROM: USS EXPLO
TO: COMNAVREG HAWAII HI//N52//
NAVFAC HI PEARL HARBOR HI//20//
COMPACFLT PEARL HARBOR//04E//
COMTHIRDFLT (for pollution originating from ships)
INFO: CNO WASHINGTON DC//OP45//
MSCPAC OAKLAND CA//
NAVY JAG ALEXANDRIA VA//
COMNAVFACENGCOM ALEXANDRIA VA//181//
COMNAVSEASYSCOM WASHINGTON DC//00C24//
PACNAVFACENGCOM PEARL HARBOR HI//114//
NEESA PROT HUENEME CA//112//
NAVPETOFF ALEXANDRIA VA//
(APPLICABLE NOSC)
(PROPERTY OWNING ACTIVITY -- IF OTHER THAN THE ORIGINATOR)
BT
CLASSIFICATION//N03100//
SUBJ: OPREP-3 NAVY BLUE
MSGID/GENADMIN/EXPLO/009B/MAY//
AMPN/INITIAL VOICE REPORT TO COMNAVREG HAWAII//RMKS/

1. INCIDENT: DURING AN INSPECTION OF A CARGO MAGAZINE FOR REPORTED FLOODING, TWO CREW MEMBERS OVERCOME BY TOXIC FUMES.

2. CDR'S ESTIMATE: DUE TO THE NATURE OF THE CARGO, PRESENT EFFORTS ARE LIMITED TO CONTROLLING THE FLOODING OF THE COMPARTMENTS, SHIP MAINTAINS INTEGRITY. ANTICIPATE ARRIVAL AT PEARL HARBOR IN 48 HOURS.

3. REFERENCE: VOICE REPORT TO COMNAVREG HAWAII 231937Z MAY 1986.

4. DETAILS: GGGG
   A. TIME: APPROX 232000Z MAY 1986
   B. LOCATION: 18ON 165OW APPROX 140 NM WSW PEARL HARBOR.

5. NARRATIVE: FLOODING FROM UNKNOWN SOURCE CAUSED ONE OR MORE CONTAINERS TO BEGIN LEAKING. ACTIONS BY SHIPS CREW LIMITED TO USING EDUCTORS AND PUMPS TO PREVENT FLOODING OF THE COMPARTMENT. ASSISTANCE REQUESTED FROM EOD TO STABILIZE THE CARGO FOR OFFLOADING.

6. LOSS/DAMAGE: TWO INJURED CREW MEMBERS BEING READIED FOR MEDEVAC TO NAVAL HOSPITAL AT PEARL HARBOR FOR TREATMENT. NAMES OF INJURED WITHHELD PENDING NOTIFICATION.

7. REMARKS: FOR COMNAVREG HAWAII, REQUEST AUTHORITY TO ENTER JBPHH AFTER CARGO STABILIZED. FOR MSCPAC, REQUEST OFFLOADING INSTRUCTIONS FOR DAMAGED CARGO AND DECONTAMINATION/CHECKUP FOR REMAINING CREW//BT

This Page Intentionally Left Blank.

TABLE A-7: CAUSE CODES AND SUPPLEMENTAL INFORMATION		
Code	**Spill Cause Description**	**Additional Information**
	PERSONNEL ERRORS	
P01	VALVE AND VALVE MANIFOLD MISALIGNMENT	All valve and manifold operation and alignment errors. Personnel mistakenly opens/closes wrong valve, does not verify valve alignment prior to operation, does not perform alignment as dictated by procedures or does not fully close a valve. This category does not include alignment errors that result from personnel following documented procedures that are in error. (See Cause Code D01) Provide specific system, valve/manifold name and number, and valve alignment/operation error. Are the valves listed in the EOSS or other shipboard documentation? Example: Fuel transfer system. Tank xxxx manually operated fill valve yy-yyy not fully closed and not verified closed by personnel after fill.
P02	MONITORING/SOUNDING ERRORS	All tank level monitoring and sounding mistakes including failure by personnel to adequately observe a tank level during a fill operation. Provide specific tank name and the sounding/fluid level monitoring procedure used or not followed correctly. Why was the sounding/monitoring error made? Are the sounding tables correct? Are the tanks top sounded or bottom sounded? Was a sounding tape bob broken off in the tube? Example: Personnel incorrectly read sounding tape while monitoring the fuel oil service tank level during transfer. Personnel had not received adequate training and did not know correct procedure for obtaining sounding tape readings.
P03	COMMUNICATION ERRORS/FAILURE TO FOLLOW ORDERS	Failure by personnel to properly signal commands, inability to communicate with watchstanders, misunderstanding of commands and failure of personnel to properly follow commands. What commands were given and how and why were they not received or not followed. Example: Personnel failed to secure fuel transfer pump when order was given.
P04	HOSE AND PIPE HANDLING ERRORS INCLUDING RESIDUAL IN HOSES AND PIPES	Mishandling of hoses and fuel probes, premature disconnect of hoses and fuel probes under pressure, failure to cap, properly drain or blow down hoses or allowing residual in hoses to spill. Spilling residual fuel/oil when disconnecting or repairing pipes and tubing. Were proper blowdown and back suction conducted? Provide specifics on whether spill was a result of a) poor hose handling practices, b) mishandling of fuel probe, c) residual in hose d) residual in pipe/tube.
P05	TANK OVERFILL/OVERPRESSURE/BURP/FUEL IN COMP SEAWATER	Overfilling of tanks or fuel escaping through tank vent caused by personnel error not related to any of the above causes. Usually cause is unexplained or not understood. Includes over-pressurizing tanks by exceeding recommended fill rate or pressure, tank 'burps' associated with over-pressurizing or exceedingly fast fill rates, and oil entrained in overboard compensating seawater. Provide system and tank identification. If possible, determine specific personnel error that resulted in tank overfill, venting or burp.
P06	ACCIDENT/ACCIDENTAL SPILL DUE TO PERSONNEL ERROR	All accidents with the exception of major casualties, crashes and sinkings (see Cause Code C01). Includes spilling or tipping of oil containers, minor vehicle mishaps, mishandling of cargo that results in a spill, movement of equipment that breaks a fuel/oil line, excavation resulting in a broken fuel/oil line, and demolition and construction accidents. Provide equipment/container information and details on how accident occurred. Determine if lack of or inadequate training was contributory.
P07	ILLEGAL DUMPING OR IMPROPER DISPOSAL	Improper disposal of fuel, oils, and waste oil. Dumping of oil illicitly.
P08	ALL OTHER PERSONNEL ERRORS NOT LISTED ABOVE	All personnel errors not listed above that lead to a spill. Includes causes such as failure to remain at watch station, not following repair/maintenance procedures, disobeying a command, and conducting unauthorized fuel/oil transfers.

TABLE A-7: CAUSE CODES AND SUPPLEMENTAL INFORMATION		
Code	**Spill Cause Description**	**Additional Information**
	EQUIPMENT FAILURES	
F01	VALVE/VALVE CONTROL/SOLENOID FAILURES	All valve, valve components, valve controller, valve actuator, motor, and solenoid failures. Provide specific system name and part numbers. Provide details on the nature of the component/system failure. Can recommendations be made for a design change, improvement to component or use of another part eliminate this problem? Were there any recent repairs or maintenance on the system or component?
F02	PIPING/PIPE FITTING/MANIFOLD/TUBING/TUBE FITTING FAILURES	Piping, all pipe fittings, gage fittings (but not gages), manifold, tubing and tube fitting failures including leakage from cracks and corrosion. Does not include failures of valve, gaskets, packings, seals, o-rings, or hoses. Provide specific details on pipe/tubing system, type of fluid carried, specifics on failure mode, part/fitting number (if any). What type of repair/replacement was made? Has this problem or failure occurred before? Were there any recent repairs or maintenance on the system or component? Material of pipe? Is pipe corrosion a result of the wrong material being used in the system?
F03	HOSE/HOSE FITTING/HOSE TENDING LINE/FUEL PROBE FAILURES	All hose and hose fitting related failures including hose tending and fuel probes. Provide information on the hose, type of fluid carried, part number (if appropriate), describe the failure mode. Were there any recent repairs or maintenance on the system or component?
F04	SEAL/GASKET/PACKING/O-RING FAILURES	All pipe joint, flange, fitting, seals, gaskets, and o-ring failures. All fluid handling component gaskets, seals, packing and o-rings including pumps and filters. Provide specific system name, part number, type of seal, seal material. What type of repair/replacement was made? Has this problem or failure occurred before? Were there any recent repairs or maintenance on the system or component?
F05	AUTOMATIC CONTROLS/ALARMS AND INDICATOR FAILURES INCLUDING TLIS	Includes all automatic shut-off controls and actuators (but not failures in shut-off valves), Tank Level Indicator components, displays, alarms, indicators, gages, site glass and site tubes. Includes sounding tube and sounding tape failures. Provide specific system name, part number, type of control or indicator. What type of repair/replacement was made? Has this problem or failure occurred before? Were there any recent repairs or maintenance on the system or component?
F06	OIL WATER SEPARATOR SYSTEM/OIL CONTENT MONITOR FAILURES	All components of OWS and the OCM including piping, fittings, indicators, and sensors installed as part of the OWS system. Includes diverter valve and oily waste transfer pump. Provide specific part number, type of failure and failure mode. What type of repair/replacement was made? Has this problem or failure occurred before? Provide information (if known) on system operation at the time of failure. Were there any recent repairs or maintenance on the system or component?
F07	FUEL OIL SEPARATOR/PURIFIER/FILTER FAILURES	All components of fuel oil separator, purifier and filtration including piping, fittings, indicators, and sensors installed as part of the separator system. Provide specific part number, type of failure and failure mode. What type of repair/replacement was made? Has this problem or failure occurred before? Provide information (if known) on system operation at the time of failure. Were there any recent repairs or maintenance on the system or component?
F08	HYDRAULIC EQUIPMENT AND HYDRAULIC SYSTEM COMPONENT FAILURES	All components of an equipment's hydraulic system e.g. those for winches, hoists, and vehicles. Includes hoses, piping, fittings, and seals. Does not include failures in a shipboard hydraulic oil piping system or transfer of hydraulic fluid. (See Cause Code F02) Do not include maintenance induced or accident induced failures. Provide name of equipment or vehicle type, operation at time of failure of component, component name and number if known. Were there any recent repairs or maintenance on the system or component? Example: Hydraulic supply hose fitting on deck winch began leaking during winch operation and sprayed hydraulic fluid on the deck.

TABLE A-7: CAUSE CODES AND SUPPLEMENTAL INFORMATION		
Code	**Spill Cause Description**	**Additional Information**
F09	ALL OTHER ELECTRO-MECHANICAL EQUIPMENT FAILURES	All equipment, vehicle, aircraft system, hull, mechanical or electrical system failure not listed above. Provide details on system or vehicle type. Describe failure mode and provide part numbers if known. Were there any recent repairs or maintenance on the system or component?
10	STRUCTURAL FAILURES	Major structural failures including seems, welds and failures due to corrosion. Primarily used to classify failures in storage tanks, ships, and craft. Provide information on the type of structure (e.g. fuel oil storage tank) and type of failure (e.g. corrosion in tank bottom). Describe action taken to correct failure. Were there any recent repairs or maintenance on the system or component?
		DOCUMENT ERRORS
D01	DOCUMENTATION/EOP/EOSS ERRORS	All spills that result from errors in written procedures, technical documentation or labeling of components. NOTE: Messages may identify cause as a 'Procedural Error' when in actuality a Personnel Error (not following procedures) is meant. Identify the specific name and number of the operating procedure / OSS/technical document in error. Provide description of error. Identify the specific chapter/section/paragraph of the document that is in error and why. If a valve or control is miss-labeled, identify the system, function, and part number.
		CASUALTY
C01	CASUALTY/SINKING/CRASH	All major casualties regardless of cause. Includes mid-air collisions, aircraft crashes, ship collisions, sinking of ships and craft, grounding of ships, major (catastrophic) fires onboard ship or at fuel storage facilities. Does not include ground vehicle collisions. No additional cause information is required for spill reporting.
		OTHER
T01	NATURAL CAUSES (STORM /RAIN RUN-OFF/TIDE OR WAVE INDUCED ROLL/LIST)	Weather related spills e.g. heavy rains washing oily residue off a pier, storm induced erosion of soil support around a pipeline, unusual high tides, waves, or seas causing a spill from a ship or craft's fuel tank. Determine if spill is actually caused by a storm or if personnel error is actual cause. Examples are containers left open and rainwater causing overfilling and spillage. Provide information as to how spill occurred and if it was preventable.
T02	THERMAL EXPANSION CAUSING TANK OVERFLOW	Heat expansion of fuel (primarily in aircraft fuel tanks) causing overflow from tank vent. Provide information on aircraft or vehicle and determine that cause was indeed thermal expansion and not personnel error or component failure.
T03	RECURRING (WEEPING SEAWALLS/OLD SPILLS/CHRONIC SEEPAGE/CONTAMINATED SOIL)	All old or recurring spills including oil stirred up from under a pier, residual from a spill that was previously reported and contamination of soil from an old spill. Determine that spill is indeed from a documented recurring or old spill.
T04	OTHER CAUSE NOT LISTED ABOVE	Provide brief description of cause of spill and text description of cause.
		UNKNOWN
U01	CAUSE NOT SPECIFIED/CAUSE UNDER INVESTIGATION/TO BE DETERMINED	Follow up with Navy activity or on-scene coordinators is required if cause of spill not identified in message. Determine what if any other fuel/oil transfers may have been conducted in 24 hours prior to spill being sighted.
U02	UNKNOWN CAUSE	Message identifies spill cause as unknown. Includes spills from unknown sources and sheen sightings.

This Page Intentionally Left Blank.

APPENDIX B
RESPONSE PERSONNEL AND EQUIPMENT

B.1 RESPONSE PERSONNEL

B.1.1 Incident Commander

The Facility Commander has assigned the role of Incident Commander to the PMRF Fire Chief. For spills beyond the response capabilities of PMRF the CNRH NOSC Representative will assume the role of Incident Commander. See Appendix A for contact information.

B.1.2 PMRF Fire Department

Upon discovery of a spill, facility personnel are to contact Emergency Dispatch. The Fire Department is the first responder for all land-based Oil and Hazardous Substance (OHS) spills. The Fire Chief or most senior officer on duty will assume the duties as the Incident Commander for the initial emergency phase of the spill. All fire fighters are trained to the HAZMAT Tech Level. The Fire Station is located at Building 300.

B.1.3 PMRF Spill Response Team

The Spill Response Team (SRT) consists of HAZWOPER certified members who are responsible for responding to and cleaning up OHS spills at PMRF. To ensure quick responses to spills the SRT is split into three teams, one each at Barking Sands, Port Allen, and Kokee/Makaha Ridge.

For an OHS spill, Emergency Dispatch will call the SRT Coordinator, who will in turn call out the appropriate team members. The SRT will then meet the Fire Department at the scene of the spill and take on a support role. Once the Fire Department has contained the spill the SRT takes over the cleanup of the spill and the SRT Coordinator assumes the role of Incident Commander. Note that for OHS releases at Port Allen and Kokee/Makaha Ridge the SRT on-site will be the first responder until the Fire Department arrives. For spills at Port Allen the SRT is the lead responder, and the Fire Department takes on a support role.

The SRT Coordinator's contact information is:

Environmental, Safety and Health Manager
PMRF Barking Sands
Building 373, Supply
Office: 335-4556
Cell: (972) 489-5977

B.1.4 PMRF Emergency Operations Center (EOC)

In the case of a large OHS spill the PMRF EOC will be activated and the Incident Management Team (IMT) will be recalled. The EOC is the physical location where the incident management will take place. The IMT will:

- Support the Incident Command Post at the scene of the incident.
- Direct incident response activities encompassing the installation.
- Manage information and resource requests.
- Coordinate with local and federal agencies.
- Report to higher headquarters.

B.1.5 CNRH Regional Operations Center (ROC)

For large spills beyond the response capabilities of PMRF, the CNRH ROC will be activated and it's IMT will be recalled. The ROC can provide PMRF with regional response assets and subject matter experts, among other resources.

B.2 RESPONSE EQUIPMENT

B.2.1 Fire Department

Table B-1 lists the Fire Department's crash fire vehicles. Table B-2 list the contents of the Fire Department's HAZMAT trailer. All equipment is located at the Fire Station, Building 300.

TABLE B-1: CRASH FIRE VEHICLES

Call Sign	Vehicle Type	Location	Resource Type
Chief 1	2002 Ford, F250, 4X4	Open 6' truck bed, roof racks, front mounted winch	Command / Utility
Chief 2	2003 Ford, F-150, 4X4	Camper shell w/ pullout command module	Command
Prevention 3	2003 Ford, Ranger	Camper shell	Inspections
ARFF 4	2011 Rosenbauer, Panther, 4X4	750 GPM, 1500 gal water, 200 gal AFFF, 500lbs Dry Chem	Aircraft Firefighting
ARFF 5	2009 Rosenbauer, Panther, 4X4	750 GPM, 1500 gal water, 200 gal AFFF, 500lbs Dry Chem	Aircraft Firefighting
ARFF 6	2009 Rosenbauer, Panther, 4X4	750 GPM, 1500 gal water, 200 gal AFFF, 500lbs Dry Chem	Aircraft Firefighting
Rescue 8	2008 GMC C-5500, Contender	Specialized tools carrier, front mounted winch	Rescue Vehicle
Medic 9	2009 Chevy 4500, AEV	BLS Medical care equipment	Amb. Patient T-port
Medic 10	2011 Ford, E-450	BLS Medical care equipment	Amb. Patient T-port
Engine 11	2008 Pierce, Arrow-XT	Top-mounted deck gun, 1500 GPM, 750 gal water, 30 gal Class A Foam	Structural Firefighting
Engine 12	2008 Pierce, Arrow-XT	Top-mounted deck gun, 1500 GPM, 750 gal water, 30 gal Class A Foam	Structural Firefighting
HazMat Trailer	2009 Featherlite, 15' Box	Rear ramp load, Special Operations trailer: HazMat, ReHab	HazMat & Rehab
Water 1	2004 Yamaha, FX Cruiser	160 HP motor, rescue sled	Water Rescue
Water 2	2004 Yamaha, FX Cruiser	160 HP motor, rescue sled	Water Rescue
Point of Contact: Fire Chief, 335-8288 (office); 335-4333 (24-Hr.)			

TABLE B-2: CRASH FIRE HAZMAT TRAILER INVENTORY

COMPARTMENT 1

Quantity	Equipment	Required
1	Vacuum (HEPA) Model # PF25HM	1
8	Sked	4
1	Sketch Board	1
1	Spare Tire	1

TABLE B-2: CRASH FIRE HAZMAT TRAILER INVENTORY		
COMPARTMENT 2		
Quantity	**Personal Protective Equipment (PPE)**	**Required**
5	Level A Suits: Large (M091N2WDO) (M022N2AAZ)(M022N2AAX) (M022N2AAW) (M852N2FCI) (M852N2FCH)	6
4	Level A Suits: X-Large (M846N2FGP) (M846N27GK) (M089N2WDE) (M846N27GR) (M090N2WDI)	5
3	Level A Suits: XX-Large (M091N2G0J) (M0901N2G0H) (M090N2WDI)	3
4	Vapor Protection Footwear: Size 9	4
5	Vapor Protection Footwear: Size 10	5
4	Vapor Protection Footwear: Size 11	4
4	Vapor Protection Footwear: Size 12	4
2	Vapor Protection Footwear: Size 13	3
1	Vapor Protection Footwear: Size 15	1
6	Level B Encapsulated Suits: Large	8
7	Level B Encapsulated Suits: X-Large	8
8	Level B Non-Encapsulated Suits: Large	8
8	Level B Non-Encapsulated Suits: X-Large	8
12	Ansell Green Rubber Gloves: Size 9, 10, 11	12
1	Nitrile Gloves: X-Large	2
1	Latex Gloves: Large	1
1	Latex Gloves: X-Large	1
0	Rubber Slippers: Size 10.5	1
1	Rubber Slippers: Size 11.5	-
0	Scotts SCBA Pack	-
0	Chemical Tape	4
Quantity	**Detection**	**Required**
1	Radiac Meter	-
1	Radiac Probe	-
Quantity	**Mitigation**	**Required**
1	Leak Control Kit	1
1	Chlorine Institute Emergency Kit "A"	1
1	Plug and Patch Kit	1
1	Spill Kit Accessory Bag	1
1	30 Ft. Yellow DECON Bladder	1

TABLE B-2: CRASH FIRE HAZMAT TRAILER INVENTORY		
Quantity	**Special Equipment**	**Required**
6	Hazmat Incident Identification Kit: 500' Rolls	1
1	Quick Tent 10 x 15	1
0	Directional Wind Flag	1
1	Misting Fan	1
4	Rehab Vest	4
8	Water Packs for Rehab Vests	8
1	Green Flood Lights With Stands	1
1	Weather Pack-400	1
2	Backpack with Manual Pump	2
1	Captair Field Pyramid	1
2	102 Quart Cooler	2
2	Polymer 25 Floor Sealer 5 Gal.	2
1	Commercial Quick Tent	1
1	3 Gallon Water Cooler	1
7	Camouflage Chairs	8
2	Folding Chairs	4
1	Green Hose	1
1	Red Hose	2
1	Stanley Fat Max Biohazard Kit (Fac Bag)	1
1	Bio Sampling Bag Kit	1
1	Double Female	1
1	Blue Tarp Pool	0
2	Bon-It DECON Privacy Kit	2
1	Container De-Fog And Baby Powder	0
0	Air Horn	1
Quantity	**Reference Materials**	**Required**
1	Hydrazine Response	1
1	PMRF Emergency Hazardous Inventory	1
1	DOD Mass DECON	1
1	Facility HAZMAT Information	1
1	ERG	1
1	Chem-Bio Handbook	1
1	Checklist (IC, OPS, Safety, DECON, Research, P/O, Medical, Entry)	1

TABLE B-2: CRASH FIRE HAZMAT TRAILER INVENTORY		
COMPARTMENT 3		
Quantity	**Decontamination**	**Required**
1	Tank Sprayer	2
9	Elevation Grids	9
2	Bus Pans	2
1	DECON Shower	2
3	Scrub Brushes	3
3	Shower Wands	3
4	Small Trash Cans (15 Gal.)	4
3	Large Trash Cans (50 Gal.)	4
1	10 x 30 Secondary Containment Pool (Black)	1
Quantity	**Mitigations**	**Required**
1	Spill Kit SPHZ-95	1
2	Overpack Drum 50 Gal. Yellow	2
21	Blue Absorbent Sock 3" X 48" PIG	21
13	Yellow Absorbent Sock 3" X 48" PIG	11
6	Yellow Absorbent Sock 3" X 10' PIG,	6
7	Yellow Absorbent Pillow	7
1	Bag of Absorbent Mat Pad, White, Oil Only	1
1	Bag of Absorbent Mat Pad, Blue, Oil Only	1
2	Absorbent Pigs 5" X 10' Oil Only	4
2	Over Pack Drum (50 Gal.)	2
Quantity	**Non-Aggressive Fluids**	**Required**
1	Non-Sparking Hoe-Straight Blade	1
1	Non-Sparking Shovel-Spade Point	1
1	Non-Sparking Shovel-Square Point	1
1	Non-Sparking Sledgehammer	1
1	Non-Sparking Mattock	1
1	Halligan	0
2	Spanner Wrench	0
2	Plastic Flat Shovel	2
2	Granular Absorbent (16 Liter)	2
1	ENPAC Poly Overpack (30 Gal.)	2

TABLE B-2: CRASH FIRE HAZMAT TRAILER INVENTORY		
Quantity	**Aggressive Fluids**	**Required**
2	Pads	2
1	Booms/ Socks	1
2	Loose Absorbent (16L Pail)	2
0	Drain Blockers (24" X 24", 48" X 48")	1
1	Drain Plugs Kit	1
Quantity	**Tools**	**Required**
1	Hand Truck/ Drum Dolly	1
1	Drum Opener	1
Quantity	**Special Equipment**	**Required**
1	Black Table	1
1	Conveyor Belt Roller	1
28	Orange Traffic Cones (36")	28
3	Weighted Traffic Cones	3
1	Brown Table	1
8	Yellow Plastic Bags For Contaminated PPES	4
1	Wheeled Cart (Black)	1
2	Honda Generator EU 3000	2
0	Portable Radios	8
Quantity	**Decontamination Kit**	**Required**
2	4 x 8 Containment Pools (Blue)	2
2	Waste Bladder (Orange)	2
4	Utility Pump (Submersible)	2
1	Foot Pump	1
2	MITI Orange Manifold	2
1	1 3/4" Fire Hose	1
4	3/4" Red Rubber Hose (50')	2
2	1/2" Grey Rubber Hose (50')	2
1	Dish Soap (Gal.)	1
2	Extension Cords (10' Black 3 Way)	1
0	Ground Fault Current Interrupter	1
1	Red Tarp (30'x30')	1
3	Blue Tarp (10'x10')	3
Point of Contact: Fire Chief, 335-8288 (office); 335-4333 (24-Hr.)		

B.2.2 Spill Response Team

Table B-3 lists the contents of the Spill Response Team's trailer located outside of Building 373.

TABLE B-3: SPILL RESPONSE TEAM TRAILER INVENTORY

Item	Size	Quantity
General Equipment		
Plastic Folding Chairs	N/A	12
18"X72" Folding Tables	N/A	3
Oxygen Tanks	N/A	7
Man Hole Cover Pry Bar	N/A	1
Weather Flag w/Pole and Stand	N/A	1
Heavy Duty Boots (orange)	TBD	3 Pairs
Non-Sparking Hoe	N/A	1
Non-Sparking Shovel (pointed)	N/A	3
Broom (small bristles)	Small	1
Broom (large bristles)	Large	1
Plastic Shovel (flat/green)	N/A	2
Mop Handles	N/A	2
Mop Heads	N/A	2
Vermiculite/Kitty Litter	50 Lbs.	0
Cones	Small/Large	6/3
Absorbent Pads/Blue	Case	1
Trash Bags/Black	N/A	3
55 Galllon Plastic Liners	N/A	3
Honda 1000 Portable generator	N/A	1
35 Gallon Open Head Metal Drum	N/A	1
Little Giant 1/6 Hp Submersible pump	N/A	1
13' X 13' Pop-up Tent	N/A	1
Dayton 3 Gallon Wet/Dry vacuum	N/A	1
Igloo Cooler	Small	1
Suit Bin		
Suit	Large	12
Suit	XL	25
Suit	XX	27
Suit	XXX	7
Suit	XXXX	4

TABLE B-2: CRASH FIRE HAZMAT TRAILER INVENTORY		
Item	**Size**	**Quantity**
Tape Bin		
Duct Tape (grey)	N/A	8
Caution Tape (yellow)	N/A	1
Construction Tape (yellow)	N/A	1
Chemical Tape (yellow)	N/A	1
Danger Tape (red)	N/A	1
Zip Ties (black)	Small	5 Bags
Zip Ties (black)	Medium	4 Bags
Zip Ties (black)	Large	2 Bags
Zip Ties (white)	Small	2 Bags
Zip Ties (white)	Large	4 Bags
Markers	N/A	1 Bag
Glove Bin		
Industrial Glove (black)	N/A	6
Glove (green)	N/A	29
Leather Glove	Medium	3
Leather Glove	Large	4
Leather Glove	XL	1
Leather Glove	2XL	1
Cloth Glove	N/A	3 Sets
Nitrile Glove (blue)	N/A	1
Goggles (dust/wind)	N/A	2
Goggles (chemical)	N/A	2
Safety Glasses	N/A	6
Towelettes	N/A	1 box
Tool Bin		
First Aid Kit	N/A	1
Bungees (black)	N/A	11
Extension cord	25 Feet	3
Extension cord	N/A	1
Power Strip	N/A	1
Open End Wrench	1 5/8	1
Scissors	N/A	2

TABLE B-3: SPILL RESPONSE TEAM TRAILER INVENTORY		
Item	**Size**	**Quantity**
Philips Screwdriver	N/A	2
Flat Screwdriver	N/A	5
Needle Nose Pliers	N/A	1
Hammer	N/A	1
Utility Knife	N/A	1
Bung Wrench	N/A	1
Port Wrench	N/A	2
Misc. Wrench	N/A	1
Hose Bib Adapter	N/A	1
Additional Equipment Available In Building 374		
QRAE 3 (4-Gas Meter)	N/A	1
Little Giant Submersible Pump (1/3 HP)	N/A	1
1 1/2" ID X 50' Fire Hose	N/A	1
Fire Hydrant to Fire Hose Coupling	N/A	1
5/8 X 50' Water Hose	N/A	1
Scott SCBA Packs with Full Face Masks	N/A	5
50' Extension Cord	N/A	1
Point of Contact: SRT Coordinator, 335-4556 (office); (972) 489-5977 (cell)		

B.2.3 Public Works Transporation Department

Table B-4 provides a list of contractor and government supplied heavy equipment that could potentially be utilized during a response to large land-base OHS spill. The equipment is located at the Public Works Transporation Department (Building 101).

TABLE B-4: HEAVY EQUIPMENT				
Asset #	**Description**	**Manufacturer**	**User**	**Year**
387-KBR	TRUCK, FLAT BED 524-KBJ	FORD	POOL	2003
548-KBJ	TRUCK, STAKE - FLATBED	FORD	HINO	2003
ITT30003	TRACTOR, WHEELED - LOADER-BACKHOE	J. DEERE	POOL	2003
012KBP	CRANE, WHL MTD 60T	TEREX	POOL	2008
013KBP	CRANE, WHL MTD 40T	TEREX	POOL	2009
727KXW	LOW BOY SEMI TRAILER	LA PINE	POOL	2008
008KBP	SEMI, TRUCK TRACTOR	KENWORTH	ORD	2011
433KBP	SEMI, TRUCK TRACTOR	KENWORTH	POOL	2011
-	LOADER, FRONT END CATERPILLAR	CATERPILLAR	POOL	2011
361KBP	FLATBED	FORD	POOL	2012
362KBP	FLATBED	FORD	POOL	2012

TABLE B-4: HEAVY EQUIPMENT				
Asset #	**Description**	**Manufacturer**	**User**	**Year**
634KBP	5T FLATBED TRUCK	FORD	ORD	2012
-	CRANE, TEREX 30T	TEREX	POOL	2013
817KBP	TRUCK, DUMP	PETERBUILT	POOL	2013
USN13-03958	TRUCK, FORKLIFT - 4000 LBS.	YALE	LOGISTICS/AMY	1994
USN13-11016	TRUCK, FORKLIFT - 6,000 LBS., AUTO	HYSTER	POOL	2015
USN13-15276	TRUCK, FORKLIFT - 6,000 LBS.	HYSTER	POOL	2015
USN13-48727	TRUCK, FORKLIFT - 10,000 LBS.	HYSTER	POOL	1995
USN13-69709	TRUCK, FORKLIFT - 6,000 LBS.	HYSTER	MR PWR	2005
USN13-82926	TRUCK, FORKLIFT - ROUGH TERRAIN	LIFT KING	POOL	1995
USN13-83570	TRUCK, FORKLIFT - 6,000 LBS.	HYSTER	SEPTAR	2005
USN13-85657	TRUCK, FORKLIFT - 10,000 LBS.	HYSTER	ORD	2007
USN13-90589	TRUCK, FORKLIFT - 6,000 LBS.	HYSTER	MARINE	2003
USN13-98047	TRUCK, FORKLIFT - 6,000 LBS.	HYSTER	SHP/RCV	2007
USN13-98058	TRUCK, FORKLIFT - 6,000 LBS.	HYSTER	POOL	2007
USN13-98572	TRUCK, FORKLIFT - 6,000 LBS. LPG	HYSTER	HAZMIN	1997
USN13-98770	TRUCK, FORKLIFT - 6,000 LBS.	HYSTER	TGTS	2007
USN18-00061	TRUCK, FORKLIFT - R/T 6000 LBS.	LIFT KING	POOL	1999
USN44-02955	GRADER, ROAD - MOTORIZED	CHAMPION RD	POOL	1993
USN65357	LOADER, BACKHOE	KOMATSU	POOL	2006
USN54-08428	CLEANER, WASTE OIL - COLLECT TRUCK	KEITH HUBER	LEILA	1993
USN54-09691	VACUUM TRUCK - BILGE	NAVISTAR	MARINE	2009
USN82-05414	CRANE, WHEEL MTD HYDRAULIC - 22 TON	P&H	ORD	1994
USN82-05444	CRANE, WHEEL MOUNTED - 25 TON	KOEHRING	POOL	1994
USN96-38557	TRUCK, TANK - AVGAS/JET	INTRNTNL	FUELFRM	1983
USN96-41518	TRUCK, TRACTOR - DED, 6X4	FORD	POOL	1988
USN96-41983	TRUCK, WRECKER - 4X2	GMC	POOL	1988
USN96-42270	TRUCK, STAKE - W/HTG	INTRNTNL	POOL	1988
USN96-42787	TRUCK, TANK - AVGAS/JETFUEL	ISOMETRICS	FUEL FARM	1992
USN96-42788	TRUCK, TANK - AVGAS/JETFUEL	ISOMETRICS	FUEL FARM	1992
USN96-42789	TRUCK, TANK - AVGAS/JETFUEL	ISOMETRICS	FUEL FARM	1992
USN96-42790	TRUCK, TANK - AVGAS/JETFUEL	ISOMETRICS	MARINE	1992
USN96-42921	TRK OVRHD MAINT	TECO	POOL	1989
USN96-43077	TRUCK, STAKE - 16 FT BED, W/HTG	NAVISTAR	POOL	1989
USN96-43114	TRUCK, TANK - AVGAS/JETFUEL	ISOMETRICS	MARINE	1993
USN96-43143	TRUCK, DUMP 10 CU. YD. 15 TON	INTRNTNL	POOL	1989
USN96-43720	TRUCK, TRACTOR - DED, 4X2	NAVISTAR	ORD	1990
USN96-44380	TRUCK, TRACTOR - 4X2, DED	FORD	POOL	1991
USN96-44405	TRUCK, DUMP - 10 CY, 6X4	FORD	POOL	1992
USN96-45326	TRUCK, TANK - FUEL SERVICING, 2000 GAL	NAVSTAR	PWRPLT-MARV	1995
USN96-45864	TRUCK, TANK - FUEL SERVICING, 2000 GAL	NAVISTAR	MECHANIC	1995
USN96-46266	TRUCK, TANK - FUEL SERVICING, 2000 GAL	NAVISTAR	POOL	1996

TABLE B-4: HEAVY EQUIPMENT				
Asset #	**Description**	**Manufacturer**	**User**	**Year**
USN97-31976	TRAILER, SEMI	23705	ORD	1976
USN97-33333	TRAILER, SEMI	23705	ORD	1980
USN97-33364	TRAILER, SEMI - STAKE - 20 TON	MILLER TRAIL	ORD	1979
USN97-35913	TRAILER, LOWBED - TILT DECK, 12 TON	DAKOTA MFG	POOL	
USN97-36323	SEMITRAILER, STAKE, 20 TON	KALYN	ORD	1987
USN97-37074	TRAILER, SEMI - STAKE - 20 TON	MILLER TRAIL	ORD	1988
USN97-39237	TRAILER, SEMI - STAKE, 20 TON, 2 AXLE	CLARK TRLR	ORD	1992
USN97-39839	TRAILER, SEMI - LOWBED - TILT DECK	KALYN	POOL	
USN97-40055	TRAILER, SEMI - LOWBED, 35 TON (SEPTAR - QST)	KALYN	POOL	
Point of Contact: Public Works Director, 335-7977 (office)				

B.2.4 Port Allen Marine Department

Table B-5 lists the oil spill response equipment available at Port Allen to respond to spill associated with Navy vessels and operations.

TABLE B-5: PORT ALLEN OIL SPILL RESPONSE EQUIPMENT	
Equipment	**Number/Stocking Goal**
Semi-Rigid Inflatable Boat (RIB) + Trailer	1
2007 - 19' Work Skiff	1
1994 - 19' Boston Whaler + Trailer	1
Slickbar Permanent Boom	150 Feet
Class II Response Boom	2500 Feet
Boom Mooring Systems	4
Kvichak Marine Boom Roller	1
2009 - Isometrics Vacuum Truck - 1,800 gallon	1
2008 - Douglas Environmental Portable Skimmer	1
Bales of Absorbent Pads	7
Bales of Sweeps	10
Boxes of 8’ and 5' Absorbent Booms	4 each
Boxes of 5’ Mini Booms	2
Boxes of Pompoms	10
Point of Contact: O&M Marine Supervisor, 634-9816 (office)	

B.3 NAVY SUPERVISOR OF SALVAGE (SUPSALV)

SUPSALV can provide extensive equipment resources and trained operators in support of a pollution response effort. SUPSALV is also prepared to provide operational advice and assistance to the local Facility Incident Commander regarding oil discharge response, cleanup, contingency planning, training, and salvage. SUPSALV is also available for technical assistance on HS releases as well.

Requests for technical support should be made by phone to the numbers listed below. Note that SUPSALV can only be activated by the NOSC Representative.

Phone Number: Day: (202) 781-1731 (Option #2)
24 HR: (202) 781-3889 (NAVSEA Duty Officer)

B.4 OIL SPILL REMOVAL ORGANIZATIONS

Table B-6 lists Oil Spill Removal Organizations (OSROs) available to PMRF. OSRO's can provide PMRF with additional sources of response capabilities if a shortfall or an additional response requirement arises. Note: OSROs require activation by the NOSC Representative who can contract them by using a USCG Basic Ordering Agreement (BOA).

TABLE B-6: OIL SPILL REMOVAL ORGANIZATIONS

Name	Day Phone	Other Phone	Response Time	Capability
Pacific Environmental Company (PENCO)	545-5195	524-2307 (fax)	< 12 hours	Can provide on-water containment and recovery, and on-land cleanup capabilities.
National Reponse Cororation (NRC) [1]	631-224-9141	-	< 12 hours	Can provide on-water containment and recovery, on-land cleanup capabilities, and dispersant coverage (including dispersant aircraft).

NOTES

[1]The CNRH NOSC Rep. can also access the services of the National Response Corporation by going through U.S. Navy SUPSALV.

ADDRESSES:

- Pacific Environmental Company (PENCO), 65 N. Nimitz Hwy, Pier 14, Honolulu, HI 96817
- National Response Corporation (NRC) 3500 Sunrise Highway, Suite 200, Building 200, Great River, NY 11739

B.5 MUTUAL AID AGREEMENTS

Mutual Aid Agreements (MAA) are written agreement between and among agencies and organizations and/or jurisdictions that provides a mechanism to quickly obtain emergency assistance in the form of personnel, equipment, materials, and other associated services.

PMRF has the following MAAs with local and county agencies:

- Kauai Police Department
- County of Kauai Fire Department
- State Department of Transportation
- Department of Land Natural Resources (DLNR)

The PMRF Emergency Management Officer maintains all MAAs.

APPENDIX C
HAZARD ANALYSIS

C.1 FACILITY OPERATIONS

PMRF consists of six separate site areas on the island of Kauai. These are: Barking Sands, Makaha Ridge, Kokee, Port Allen, Kamokala Ridge, and Niu Ridge. The Kamokala and Niu Ridge sites have no Oil or Hazardous Substance (OHS) storage. A brief site description and overview of OHS storage at the remaining four site areas is provided below.

Barking Sands - The majority of the OHS storage is located at Barking Sands, which is the primary site for PMRF. The Base, located on the Mana Plain, occupies a long narrow strip of land bordering the western shoreline of Kauai. The ground topography is generally flat. The site is composed of alluvium deposits and calcareous beach and sand dunes, which are very permeable. Any OHS spill would be absorbed and/or percolate into the groundwater, which is brackish and not potable. Fuel oil storage and transfer facilities at Barking Sands include a fuel farm, two tanker truck loading/unloading racks, multiple tanker trucks, numerous aboveground storage tanks to support various operations, and 55-gallon drums. The fuel farm consists only of underground storage tanks.

Hazardous storage sites at Barking Sands are identified in Section C.3.4, Table C-3. Hazardous waste/material storage sites include the 90-Day Accumulation Site (Building 392) and the Ordnance Facility (Building 419).

Makaha Ridge - This site is located on a ridge north of Barking Sands. The ridge has a steep topography and drops directly down to the sea. The operations area varies from an elevation of 1,875 ft down to 950 ft. The site is part of the Napali formation, runoff is rapid. Fuel oil storage and transfer facilities include aboveground storage tanks, associated day tanks, and piping systems to support a standby power plant. Spilled fuel has a high potential of being carried by runoff into the coastal waters.

Kokee - This location is made up of five sites located almost in a straight line, with the borders of each site less than one mile apart. Some of the sites are jointly used by NASA and the County of Kauai. Only the power plant site has fuel oil storage and transfer facilities under the control of PMRF, they include a large aboveground storage tank, associated day tank, and piping. The power plant site's topography varies from relatively flat to moderately hilly.

Port Allen - The Navy leases facilities at Port Allen from the State of Hawaii to support range operations from PMRF. Fuel oil storage facilities consist of lube oil drums and three tanker trucks which are parked in containment at Port Allen. Fueling of Navy vessels is conducted using the tanker trucks.

C.2 HAZARD IDENTIFICATION

C.2.1 Fuel Farm

The Fuel Farm consist of five 51,000-gallon Underground Storage Tanks (USTs) containing Jet A fuel. Four other 51,000-gallon USTs were taken out of service in 2021 and are scheduled to be removed. The underground storage tanks are connected together by aboveground piplines that run to two loading racks and two unloading racks. Both the loading and unloading racks have sized containment sufficient for the tanker trucks that use them.

Four 5,000-gallon capacity tanker trucks are parked in containment at the Fuel Farm. Three of these tanker trucks are used to fuel transient aircraft that visits PMRF. These tanker trucks receive fuel from the loading racks. The fourth tanker truck is used for defueling aircraft.

Two 2,000-gallon capacity tanker trucks, operated by Transportation Maintenance, are parked in containment at the fuel farm. These trucks receive their fuel from the base gas station.

Jet A fuel is delivered to the Fuel Farm by commercial 8,000-gallon capacity tanker trucks approximately two times per month (16,000-gallons/month). The fuel is offloaded at the unloading rack.

The worst-case discharge associated with this facility would be the complete discharge of the contents of one of the commercial 8,000-gallon capacity tanker trucks resulting from an accident while driving on the base.

C.2.2 Ordnance Facility

Mark 46 and 48 torpedoes, propelled by Otto Fuel II, are retrieved after firing in training exercises and are brought to the Ordnance Facility, Building 419. Otto Fuel II is a distinct-smelling, reddish-orange, oily liquid that the Navy uses as a fuel for torpedoes and other weapon systems. See Appendix I for Safety Data Sheets for Otto II.

Residual contaminants are flushed from the torpedo using a mixture of mineral spirits, mineral oil, and preservatives. This OTTO Fuel II waste is sent through a treatment process and is ultimately filled into a 2,000 gallon tank. Contaminated solid waste such as rags, soiled coveralls, and plastic gloves are placed in 55-gallon drums. The liquid OTTO fuel waste and contaminated articles are disposed of at an EPA permitted disposal facility on the mainland. The facility operates a 90-day storage sites and handles the complete storage, handling and manifesting of their waste.

The worst-case discharge associated with this facility would be large release of OTTO fuel waste during the flushing process or from the OTTO fuel waste storage tank.

C.2.3 Port Allen

The PMRF harbor facility is located at Port Allen, a state commercial harbor located approximately 20 miles southeast of PMRF. The Navy currently berths two 97’ Multi Purpose Crafts (MPC) at the harbor in support of range operations from PMRF.

The Port Allen Marine Department currently fuels the Navy vessels at dockside using one of two 5,000-gallon capacity tanker trucks. The tanker trucks are driven onto the pier and fuel is pumped directly to the vessels fuel tank via a fuel hose. Once fueling operations are completed the tanker trucks are parked adjacent to the Chevron Terminal in a parking area with sized containment.

Due to the nature of the fueling operation there is a high potential of fuel reaching harbor waters if a discharge occurs during fueling operations. Appendix E of this plan addresses potential spill response stategies for fuel spills that reach the harbor waters.

The worst-case discharge associated with this facility would be the complete discharge of the contents of one of the 5,000-gallon capacity tanker trucks resulting from an accident while driving from the parking area to the pier.

C.2.4 Makaha Ridge and Kokee Power Stations

Both the Makaha Ridge and Kokee sites have standby power stations with associated fuel oil storage tanks and piping. Makaha Ridge has two 8,000-gallon diesel aboveground storage tanks and four associated 275-gallon day tanks. Kokee has one 25,000-gallon diesel aboveground storage tank and an associated 500-gallon day tank. These tanks are refueled by 5,000-gallon capacity tanker trucks.

The most likely worst-case discharge occurring at either site would involve the complete discharge of the contents of one of the 5,000-gallon capicity tanker trucks due to an accident while at the facility.

C.2.5 Kikiaola Small Boat Harbor

PMRF runs Seaborne Power Target (SEPTAR) operations out of the Kikiaola Small Boat Harbor which is located between the towns of Kekaha and Waimae, approximately six miles from PMRF Barking Sands. SEPTAR operates small boats out of the harbor in support of range operations. Vessels are fueled at Barking Sands and carry sorbent pads for fuel spills. The most likely discharge from a vessel would be due to a mechanical failure of a boats engine.

C.3 OIL AND HAZARDOUS SUBSTANCE STORAGE

C.3.1 Storage Tank Inventory

Tables C-1 provides an inventory of Petroleum, Oils and Lubricant (POL) storage tanks located at PMRF, including remote sites. The inventory includes aboveground storage tanks, drum storage sites, portable generators, and tanker trucks.

TABLE C-1: STORAGE TANK INVENTORY*							
Tank Number	**Building**	**Activity**	**Usage**	**Product Stored**	**Capacity (Gals.)**	**Secondary Containment**	**POC[1]**
Barking Sands							
BS-101-DR	101	Transportation Maintenance	Drum Storage Area	Used Gasoline	220 (4 55-Gal Drums Max)	Concrete Base with Containment Curbing	7
BS-112-1	112	Power Plant	Day Tank for Generator	Diesel	300	Concrete Base with CMU Wall	3
BS-112-2	112	Power Plant	Day Tank for Generator	Diesel	300	Concrete Base with CMU Wall	3
BS-112-3	112	Power Plant	Day Tank for Generator	Diesel	300	Concrete Base with CMU Wall	3
BS-112-4	112	Power Plant	Day Tank for Generator	Diesel	100	Steel Basin	3
BS-112-5	112	Power Plant	Day Tank for Generator	Diesel	100	Steel Basin	3
BS-112-6-DR	112	Power Plant	Lube Oil and Part Cleaning	Lube Oil	110 (2 55-Gal Drums Max)	Steel Rack with Built-In Containment	3
BS-112-7-DR	112	Power Plant	New/Used Oil Storage	New/Used Oil	165 (3 55-Gal Drums Max)	Storage Locker with Built-In Containment	3
BS-112-8-PT	254	Electronic Warfare	Portable Tank	Diesel	500	Double-Walled Steel Tank	3
BS-114	114	Fire Pump House	Power Generation	Diesel	119	Double-Walled Steel Tank	3
BS-237-DR	237	Transportation	Used Oil Storage	Used/Lube Oil, Hydraulic Fluid, Motor Oil	165 (3 55-Gal Drums Max)	Storage Locker with Built-In Containment	7
BS-286-1	286	Military Gas Station	Gas Station	MOGAS	5,000	Double-Walled Steel Tank	-
BS-286-2	286	Military Gas Station	Gas Station	Diesel	10,000	Double-Walled Steel Tank	-
BS-326-DR	326	SEPTAR	Used Oil Storage	Used Oil	55-Gal	Poly Drum Spill Pallet	-
BS-338-DR	338	HAZMAT Center	HAZMAT Storage	Hydraulic Oil, Motor Oil, Lube Oil, Antifreeze	1,760 (32 55-Gal Drums Max)	Concrete Base with Containment Curbing	4
BS-339-DR	339	HAZMIN Center	HAZMAT Storage	Used Oil	55-Gal	Concrete Base with Containment Curbing	4
BS-363-DR	363	HAZMIN Center	HAZMAT Storage	Lube Oil, Hydraulic Fluid	880 (16 55-Gal Drums Max)	Concrete Base with Containment Curbing	4
BS-356	356	Generator Building	Stand-by Generator	Diesel	500	Double-Walled Steel Tank	3
BS-362	362	Air Operations	Stand-by Generator	Diesel	650	Concrete Base with CMU Wall	3
BS-386-1	386	Fire Pump House	Power Generation	Diesel	500	Concrete Curbed Berm	3
BS-386-2	386	Fire Pump House	Power Generation	Diesel	500	Concrete Curbed Berm	3
BS-386-3	386	Fire Pump House	Power Generation	Diesel	500	Concrete Curbed Berm	3

TABLE C-1: STORAGE TANK INVENTORY*							
Tank Number	**Building**	**Activity**	**Usage**	**Product Stored**	**Capacity (Gals.)**	**Secondary Containment**	**POC[1]**
Barking Sands							
BS-386-4-DR	386	Ground Support Equipment	Used Oil Storage	Used Oil	55-Gal	Poly Drum Spill Pallets	3
BS-392-DR	392	90-Day Site Used Oil Storage Area	90-Day Site Used Oil Storage Area	Used Oil/Used Gas	2,750 (50 55-Gal Drums Max)	Concrete Base with Containment Curbing	5
BS-410-SG	410	Power Generation	Stand-by Generator	Diesel	300	Built-In Containment Pan	3
BS-416	416	Aerial Targets	BQM-34 Engine Dip Tank	MIL-PRF-680/ TECTYL-894	550	Double-Walled Steel Tank	12
BS-416-1-DR	416	Aerial Targets	Used Oil Storage	Used Oil	55-Gal	Storage Locker with Built-In Containment	12
BS-416-2-DR	416	Aerial Targets	Used Oil Storage	Used/Lube Oil	110 (2 55-Gal Drums Max)	Plastic Spill Pallet	12
BS-419-1	419	Ordnance	Flushing Torpedoes	Mineral Spirits, Tectyl	500	Concrete Base with Containment Curbing	9
BS-419-2	419	Ordnance	Used Oil from Torpedo Flushing	Empty	3,000 (Inactive)	Concrete Berm	9
BS-419-3	419	Ordnance	Used Oil from Torpedo Flushing	Used Flushing Oil Solution	1,100	Concrete Berm	9
BS-419-4	419	Ordnance	Fuel Tote	Empty	350	None	9
BS-419-5	419	Ordnance	Fuel Tote	Empty	550	None	9
BS-419-6	419	Ordnance	Fuel Tote	Empty	550	None	9
BS-419-7	419	Ordnance	Fuel Tote	Empty	550	None	9
BS-419-8	419	Ordnance	Fuel Tote	Empty	550	None	9
BS-419-9	419	Ordnance	Fuel Tote	Empty	550	None	9
BS-448-PT	112	Aerial Targets	Jet Engine Fueling (Portable)	Empty	500 (Inactive)	Double-Walled Steel Tank	12
BS-450	450	Aerial Targets	Jet Engine Fueling	Jet-A Fuel	1,100	Concrete Base with CMU Wall	12
BS-452-1	452	Ordinance	Fuel Tote	Used Flushing Oil Solution	350	Concrete Base with Containment Curbing	9
BS-452-DR	452	Ordinance	90-Day Accumulation Site	Used Oil	1,045 (19 55-Gal Drums Max)	Concrete Base with Containment Curbing	9
BS-454	454	Fire Pump House	Power Generation	Diesel	150	Concrete Berm	3
BS-513	513	ARDEL	Fire Pump House Generator	Diesel	119	Double-Walled Steel Tank	8

TABLE C-1: STORAGE TANK INVENTORY*							
Tank Number	**Building**	**Activity**	**Usage**	**Product Stored**	**Capacity (Gals.)**	**Secondary Containment**	**POC[1]**
Barking Sands							
BS-518-1	518	ARDEL	Power Generation	Diesel	10,000	Double-Walled Steel Tank	8
BS-518-2	518	ARDEL	Power Generation	Diesel	10,000	Double-Walled Steel Tank	8
BS-518-3	518	ARDEL	Day Tank for Generator	Diesel	150	Steel Basin	8
BS-518-4	518	ARDEL	Day Tank for Generator	Diesel	150	Steel Basin	8
BS-518-5	518	ARDEL.	Day Tank for Generator	Diesel	150	Steel Basin	8
BS-518-6	518	ARDEL	Day Tank for Generator	Diesel	150	Steel Basin	8
BS-518-7-DR	518	ARDEL	Used Oil Storage	New and Used Oil	660 (12 55-Gal Drums Max)	Plastic Spill Pallets	8
BS-518-8	518	ARDEL	Stand-by Generator	Diesel	1,000	Double-Walled Steel Tank	8
BS-518-9	518	ARDEL	Day Tank for Generator	Diesel	100	Double-Walled Steel Tank	8
BS-FF-A	551	Fuel Farm	Refueler/Tank Truck Parking Area	Jet-A Fuel	15,000 (3 Refuelers @ 5,000-Gal. each) 4,000 (2 Tank Trucks @ 2,000-Gal. each)	6 Individual Formed Concrete Curbed Parking Pads	10
BS-FF-B	551	Fuel Farm	Fuel Tank Truck Rack	Jet-A Fuel	NA	Formed Concrete Curbed Pad	10
BS-FF-C	551	Fuel Farm	Pressure Release Tank	Jet-A Fuel	125	Double-Walled Steel Tank	10
BS-565-1	565	THADD Blockhouse	Stand-by Generator	Diesel	500	Double-Walled Steel Tank	14
BS-565-2-SG	565	THADD Blockhouse	Stand-by Generator	Diesel	Unknown	Unknown	14
BS-578-1	578	Missile Assembly	Stand-by Generator	Diesel	250	Double-Walled Steel Tank	3
BS-578-2	578	Missile Assembly	Day Tank for Generator	Diesel	100	Steel Basin	3
BS-591	591	Power Plant	Day Tank for Stand-by Generator	Diesel	150	Steel Basin	13
BS-592	592	Fire Pump House	Power Generation	Diesel	120	Concrete Base with CMU Wall	13
BS-595-1	595	Aegis Ashore (Launcher Site)	Power Generation	Diesel	2,000	Double-Walled Steel Tank	2
BS-595-2	595	Aegis Ashore (Launcher Site)	Power Generation	Diesel	2,000	Double-Walled Steel Tank	2

TABLE C-1: STORAGE TANK INVENTORY*							
Tank Number	**Building**	**Activity**	**Usage**	**Product Stored**	**Capacity (Gals.)**	**Secondary Containment**	**POC[1]**
Barking Sands							
BS-595-3	595	Aegis Ashore (Launcher Site)	Day Tank for Generator	Diesel	350	Built-In Containment Pan	2
BS-595-4	595	Aegis Ashore (Launcher Site)	Day Tank for Generator	Diesel	350	Built-In Containment Pan	2
BS-650-DR	650	Sandia National Lab	Used Oil Storage	Used Oil	110 (2 55-Gal Drums Max)	Poly Drum Spill Pallet	13
BS-673-1	673	Sandia National Lab	Power Generation	Diesel	10,000	Double-Walled Steel Tank	13
BS-673-2-SG	673	Sandia National Lab	Day Tank for Generator	Diesel	300	Built-In Containment Pan	3
BS-673-3-SG	673	Sandia National Lab	Day Tank for Generator	Diesel	300	Built-In Containment Pan	3
BS-800	800	Radio Station WWVH	Stand-by Generator	Diesel	2,000	Steel Tank w/Impervious HDPE Barrier	17
BS-803	803	Generator Building	Stand-by Generator	Diesel	250	Double-Walled Steel Tank	3
BS-806	806	Missile Defense (DT Radar Hard Stand)	Power Generation	Diesel	10,000	Double-Walled Steel Tank	2
BS-810-1-SG	810	Missile Defense (DT Radar Hard Stand)	Day Tank for Generator	Diesel	660	Steel Dike	2
BS-810-2-SG	810	Missile Defense (DT Radar Hard Stand)	Day Tank for Generator	Diesel	660	Steel Dike	2
BS-815-1	815	Command Undersea Surveillance	Power Generation	Diesel	10,000	Double-Walled Steel Tank	3
BS-815-2	815	Command Undersea Surveillance	Power Generation	Diesel	10,000	Double-Walled Steel Tank	3
BS-815-3-SG	815	Command Undersea Surveillance	Day Tank for Generator	Diesel	250	Steel Dike	3
BS-815-4-SG	815	Command Undersea Surveillance	Day Tank for Generator	Diesel	250	Steel Dike	3
BS-821-SG	821	Power Generation	Stand-by Generator	Diesel	300	Built-In Containment Pan	3
BS-1135-1	1135	Aegis Ashore	Power Generation	Diesel	12,000	Double-Walled Steel Tank	2
BS-1135-2	1135	Aegis Ashore	Power Generation	Diesel	12,000	Double-Walled Steel Tank	2
BS-1135-3	1135	Aegis Ashore	Power Generation	Diesel	12,000	Double-Walled Steel Tank	2
BS-1135-4	1135	Aegis Ashore	Day Tank for Generator	Diesel	300	Built-In Containment Pan	2

TABLE C-1: STORAGE TANK INVENTORY*							
Tank Number	**Building**	**Activity**	**Usage**	**Product Stored**	**Capacity (Gals.)**	**Secondary Containment**	**POC[1]**
Barking Sands							
BS-1135-5	1135	Aegis Ashore	Day Tank for Generator	Diesel	300	Built-In Containment Pan	2
BS-1135-6	1135	Aegis Ashore	Day Tank for Generator	Diesel	300	Built-In Containment Pan	2
BS-1262-SG	1262	Power Generation	Stand-by Generator	Diesel	300	Built-In Containment Pan	3
BS-1276-DR	1277	Auto Hobby	Used Oil Storage	Used Oil	55-Gal	Poly Drum Spill Pallets	11
Port Allen							
PA-77	77	Marine Systems	Fuel Tank Truck Parking Area	Diesel (2 Trucks)	5,000 Per Truck (2 Trucks Max.)	Concrete Walled Parking Pad With Roll Curb	6
PA-387-DR	387	Marine Systems	Drum Storage Area	Used Hydraulic/ Motor Oil	440 (8 55-Gal Drums Max)	Poly Drum Spill Pallets	6
Mākaha Ridge							
MR-711-1	711	Power Plant	Power Generation	Diesel	8,000	Double-Walled Steel Tank	3
MR-711-2	711	Power Plant	Power Generation	Diesel	8,000	Double-Walled Steel Tank	3
MR-711-3	711	Power Plant	Day Tank for Generator	Diesel	275	Double-Walled Steel Tank	3
MR-711-4	711	Power Plant	Day Tank for Generator	Diesel	275	Double-Walled Steel Tank	3
MR-711-5	711	Power Plant	Day Tank for Generator	Diesel	275	Double-Walled Steel Tank	3
MR-711-6	711	Power Plant	Day Tank for Generator	Diesel	275	Double-Walled Steel Tank	3
MR-711-7	711	Power Plant	Lube Oil Tank	Lube Oil	280	Double-Walled Steel Tank	3
MR-711-8	711	Power Plant	Used Oil Tank	Used Oil	280	Double-Walled Steel Tank	3
MR-711-9-DR	711	Power Plant	Lube Oil Storage	Lube Oil	110 (2 55-Gal Drums Max)	Steel Rack with Built-In Containment	3
MR-722-1-DR	722	Power Plant	Used Oil Storage	Used Oil	275 (5 55-Gal Drums Max)	Storage Locker with Built-In Containment	3
MR-722-2-DR	722	Power Plant	Used Oil Storage	Used Oil	110 (2 55-Gal Drums Max)	Storage Locker with Built-In Containment	3
MR-733	733	Motor Pool	Vehicle Fueling	MOGAS	1,000	Double-Wall Steel Tank in Concrete CMU Wall Dike	15

TABLE C-1: STORAGE TANK INVENTORY*							
Tank Number	**Building**	**Activity**	**Usage**	**Product Stored**	**Capacity (Gals.)**	**Secondary Containment**	**POC[1]**
Kōkeʻe							
K-779-1	779	Power Plant	Power Generation	Diesel	25,000	Concrete Berm	16
K-779-2	779	Power Plant	Day Tank for Generator/Fuel Dispensing	Diesel	500	Concrete Base with CMU Wall	16
K-779-DR	779	Power Plant	Lube Oil and Part Cleaning	Used Oil	110 (2 55-Gal Drums Max)	Storage Locker with Built-In Containment	16
Portable Generators							
BS-113-XQ60-PG	113	Power Generation	Portable Stand-by Generator	Diesel	150	Integral Secondary Containment Basin	3
BS-113-XQ100-PG	113	Power Generation	Portable Stand-by Generator	Diesel	167	Integral Secondary Containment Basin	3
BS-113-XQ200-PG	113	Power Generation	Portable Stand-by Generator	Diesel	365	Integral Secondary Containment Basin	3
BS-113-XQ230-PG	113	Power Generation	Portable Stand-by Generator	Diesel	440	Integral Secondary Containment Basin	3
BS-113-TIER4F-PG	113	Power Generation	Portable Stand-by Generator	Diesel	79.3	Integral Secondary Containment Basin	3
BS-358-XQ60-PG	358	Base Security	Portable Stand-by Generator	Diesel	100	Integral Secondary Containment Basin	3
BS-432-PG	432	TACAN	Portable Generator	Diesel	100	Unknown	3
BS-650-PG	650	Sandia National Lab	Portable Generator	Diesel	192	Integral Secondary Containment Basin	13
BS-113-XQ30-PG	803	Power Generation	Portable Stand-by Generator	Diesel	77	Integral Secondary Containment Basin	3
BS-113-XQ60-PG	803	Power Generation	Portable Stand-by Generator	Diesel	157	Integral Secondary Containment Basin	3

*** Data updated June 2022**

KEY:

HDPE - High-Density Polyethylene Membrane
MGS - Military Gas Station
N/A - Not Applicable
NEX - Navy Exchange
TBD - To Be Determined
THADD - Terminal High Altitude Area Defense
UNK - Unknown

[1] POC's:

1. Stanley Mora - (808) 335-4050
2. Spencer Altom - (808) 335-7066
3 John Inouye - (808) 335-4270
4. Galen Alvarez - (808) 335-4308
5. Jose Felix - (808) 335-4192
6. Kai Christianson - (808) 335-7992
7. Sean Martin - (808) 335-4354
8. William Yamamoto - (808) 335-4150.
9. Jeff Rita - (808) 335-4373
10. Keneze Lazaro - (808) 335-4477
11. Steve Swacker - (808) 335-4439
12. George Yangco - (808) 335-4757
13. John Inouye - (808) 335-737
14. Robyn Pu'u - (808) 335-4407
15. Randy Chinen - (808) 335-4755
16. Leon Gonsalves - (808) 335-4256
17. Dean Okayama, Chris Fujita, Dean Takamatsu - (808) 335-4361

C.3.2 Underground Storage Tanks (USTs)

Table C-2 provides an inventory of USTs located at PMRF. Appendix K discusses the required response actions and notifications for releases of fuel from an UST per the State of Hawaii's administrative rules on USTs.

TABLE C-2: UNDERGROUND STORAGE TANKS

Tank ID / Former Tank ID	Location	Product	Capacity (Gal)	Use	Secondary Containment	Leak Detection
1 / 112	Power Plant, Bldg. 112	Diesel	30,000	Fuel Storage	None	ATG System
M-1 / M-516A	Cal Lab, Bldg. 516	Diesel	1,000	Fuel Storage	None	ATG System
F-4 / F-522	Fuel Farm, Bldg. 551	Jet A	51,000	Bulk Storage	None	ATG System
F-6 / F-524	Fuel Farm, Bldg. 551	Jet A	51,000	Bulk Storage	None	ATG System
F-7 / F-525	Fuel Farm, Bldg. 551	Jet A	51,000	Bulk Storage	None	ATG System
F-8 / F-526	Fuel Farm, Bldg. 551	Jet A	51,000	Bulk Storage	None	ATG System
F-9 / F-527	Fuel Farm, Bldg. 551	Jet A	51,000	Bulk Storage	None	ATG System
686	Sandia National Laboratory, Bldg. 686	Diesel	1,500	Fuel Storage	Double-Walled	ATG System
1 / 1291A	NEX Gas Station, Bldg. 1291	MOGAS	5,000	Fuel Storage	None	ATG System
2 / 1291B	NEX Gas Station, Bldg. 1291	MOGAS	5,000	Fuel Storage	None	ATG System

Notes:
1. The Fuel Farm tanks (F-4, F-6, F-7, F-8, and F-9) are single wall steel, horizontal cylindrical in design, internal epoxy coated, equipped with external cathodic protection, and ATG probes that can provide monthly 0.2 gph monthly leak detection testing.
2. Fuel Farm tanks F-1, F-2, F-3, and F-5 were taken out of service in 2021.
3. The Fuel Farm tanks provide fuel via aboveground pipelines to a truck loading/off-loading rack located within the Fuel Farm.

C.3.3 Oil-Filled Electrical Transformers

Table C-3 provides an inventory of oil-filled electrical transformers located at PMRF.

TABLE C-3: OIL-FILLED ELECTRICAL TRANSFORMERS

Transformer ID	Location	Type	Capacity (Gals.)
X-226	Barking Sands D-16	Pad Mounted	1362
X-227	Barking Sands D-16	Pad Mounted	1362
X-228	Barking Sands D-16	Pad Mounted	152
X-178	Barking Sands D-16	Pad Mounted	482
X-11	Barking Sands D-16	Pad Mounted	Dry (No Oil)
X-12	Barking Sands D-16	Pad Mounted	Dry (No Oil)
X-121	Barking Sands D-20	Pad Mounted	275
XMR-25	Makaha Ridge O-27	Pad Mounted	437
XMR-26	Makaha Ridge O-27	Pad Mounted	437
XMR-22	Makaha Ridge O-26	Pad Mounted	Dry (No Oil)
XMR-23	Makaha Ridge O-26	Pad Mounted	Dry (No Oil)
XMR-3	Makaha Ridge O-26	Pad Mounted	Dry (No Oil)
XMR-5	Makaha Ridge M-24	Pad Mounted	Dry (No Oil)
NX33	Kokee NASA O-29	Pad Mounted	184

TABLE C-3: OIL-FILLED ELECTRICAL TRANSFORMERS			
Transformer ID	**Location**	**Type**	**Capacity (Gals.)**
NX-1	Kokee M-30	Pad Mounted	155
NX-8	Kokee K-30	Pad Mounted	124
NX-9	Kokee K-30	Pad Mounted	145
NX-10	Kokee K-30	Pad Mounted	121
U2	Kokee N-29	Pad Mounted	190
T3	Kokee N-29	Pad Mounted	190
T2	Kokee N-29	Pad Mounted	134
T1	Kokee N-29	Pad Mounted	121
NX-36	Kokee N-29	Pad Mounted	205
U1	Kokee N-29	Pad Mounted	150

C.3.4 Hazardous Substance Storage

Table C-4 provides an inventory of hazardous substances stored at PMRF.

TABLE C-4: HAZARDOUS SUBSTANCE STORAGE[1]			
Building #	**Hazardous Substance**	**Container Type**	**Point of Contact[2]**
300	AFFF	E	Annette Ventura 335-7548
338	AFFF	E	Clifford Akana 335-4341
384	AFFF	C	Jimmy Costales 335-4261
315, 821	Chlorine	L	Leila Kamakele 335-4288
338	Chlorine	L	Clifford Akana 335-4341
112, 800, 803, 356, 362, 1262	Diesel Fuel	A	John Inouye 335-4270
1116	Diesel Fuel	P	TBD 335-4286
112	Diesel Fuel	B	John Inouye 335-4270
286	Diesel Fuel	B	Clayton Yonahara 335-4688
516	Diesel Fuel	B	Kelli Ruiz 335-4841
386	Diesel Fuel	C	Annette Ventura 335-7548
771 (Makaha)	Diesel Fuel	A	Brenn Nakaahiki 335-4315
779 (Kokee)	Diesel Fuel	A	Leon Gonsalve 335-4256
Marine Dept., Port Allen	Diesel Fuel	P	Kai Christensen 335-3236
338	Ethylene Glycol	D	Clifford Akana 335-4341
286	Gasoline, Unleaded	B	Clayton Yonahara 335-4688

TABLE C-4: HAZARDOUS SUBSTANCE STORAGE[1]			
Building #	**Hazardous Substance**	**Container Type**	**Point of Contact[2]**
Marine Dept., Port Allen	Gasoline, Unleaded	P	Kai Christensen 335-3236
105, 708, 715, 725, 785	Heptafluoropropane (FM 200)	L	Janis Kimata 335-8287
450, 554	Jet A Fuel	A	Kenzie Lazaro 335-4477
551, Fuel Farm	Jet A Fuel	B	Kenzie Lazaro 335-4477
338	Mineral Spirits	D	Clifford Akana 335-4341
415	Mineral Spirits	D	Dave McDaniel 335-4782
338	Oil	D	Clifford Akana 335-4341
112	Oil	D	John Inouye 335-4270
412	Oil	D	Dave McDaniel 335-4782
235	Oil	Unk.	Sean Martin 335-4354
321, 1291, 1308, 1262, 801	Propane	A	John Inouye 335-4270
338	Propane	L	Clifford Akana 335-4341
338	Sulfuric Acid	M	Clifford Akana 335-4341

Container Type Codes:

A	Above ground tank	G	Carboy	M	Glass bottles or jugs
B	Below ground tank	H	Silo	N	Plastic bottles or jugs
C	Tank inside building	I	Fiber drum	O	Tote bin
D	Steel drum	J	Bag	P	Tank wagon
E	Plastic/non-metal drum	K	Box	Q	Rail car
F	Can	L	Cylinder	R	Other

Note:

[1]The Fire Department maintains an updated list of all hazardous substance storage on base.
[2] All phone numbers are a 422 extension from base phones

APPENDIX D
OHS Spill Containment and Cleanup

D.1 INTRODUCTION

This appendix provides general information pertaining to recommended Oil and Hazardous Substance (OHS) spill containment and clean-up procedures. Emergency response to, and cleanup of, spill incidents which potentially may expose workers to hazardous materials, health hazards, or safety hazards must be performed by properly trained personnel in accordance with Occupational Safety and Health Administration's (OSHA's) hazardous waste operations and emergency response training protocol (see Appendix H).

Disposable equipment and resources should be used for containment and clean-up procedures whenever possible. All contaminated material and spilled substances shall be placed in appropriate containers for disposal, appropriately labeled, and taken to the Hazardous Waste (HW) Central Accumulation Point for proper disposal. Non-disposable equipment used will be properly decontaminated and restored to readiness for future use.

The Spill Response Team's Incident Commander will direct all activity related to the response and clean-up of a spill site. If it is beyond the facility's capabilities, the NOSC Representative may assume the role of the Incident Commander.

D.2 OIL SPILL CONTAINMENT PROCEDURES AND CLEANUP

Several techniques for containing oil spills are presented in this section. Based on the incident specific information, the responder can choose the most appropriate technique or combination of techniques. Note, that the effectiveness of each technique depends on the physical properties of the oil released (especially miscibility and density relative to water).

Table D-1 briefly outlines options for containing oil spills which typically have densities less than water (i.e., floats).

TABLE D-1: OIL CONTAINMENT ON WATER AND LAND

Water Course / Land Feature	Small Amounts of Oil	Large Amounts of Oil
Ditches	Straw bale dam, or sorbent barrier	Blocking dam
Streams - Shallow, small flow	Overflow dam and fixed boom and sorbents, or straw bale/sorbent dam	Overflow and blocking dam
Streams - Shallow, large flow	Straw bale dam, or sorbent barrier	Underflow dam
Pond or Lake (no or little flow)	Boom and sorbents materials	Boom plus sweep boom
Vegetative (i.e., grass, soil)	Earthen berm and sorbent materials	Earthen berm or trenches
Solid Surface (i.e., pavement)	Sorbent materials	Containment berm of sorbent materials, earth, sand, etc., or booms (sorbent or chemically resistant)

D.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 (see Figure D-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; sandbags, 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.

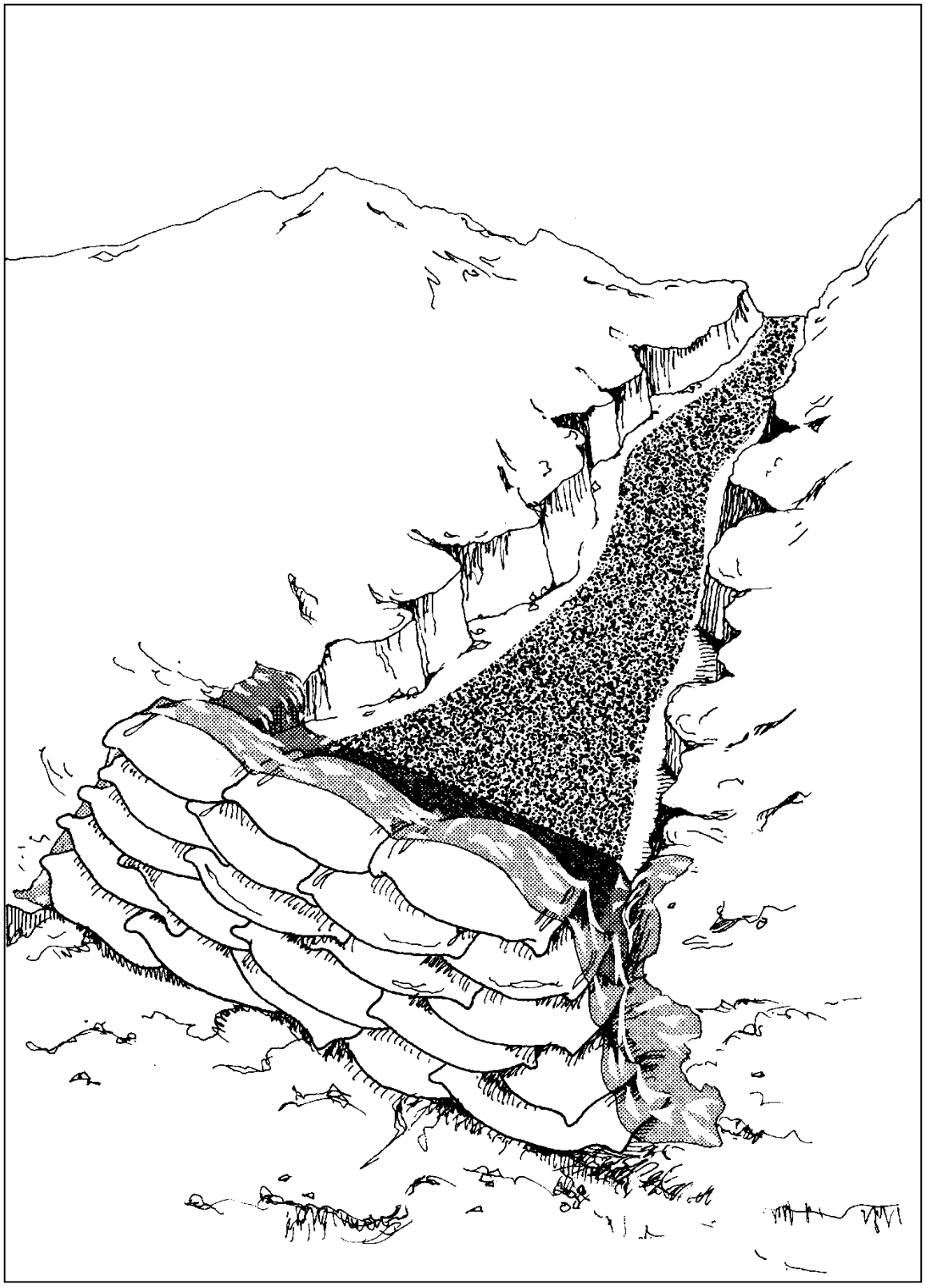


FIGURE D-1: SANDBAG BLOCKING DAM

D.2.2 Flowing Water Dams (Underflow, Overflow)

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 D-2.

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 (see Figure D-2, Technique B). 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 Figure D-2, Techniques C 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.

Variations - None.

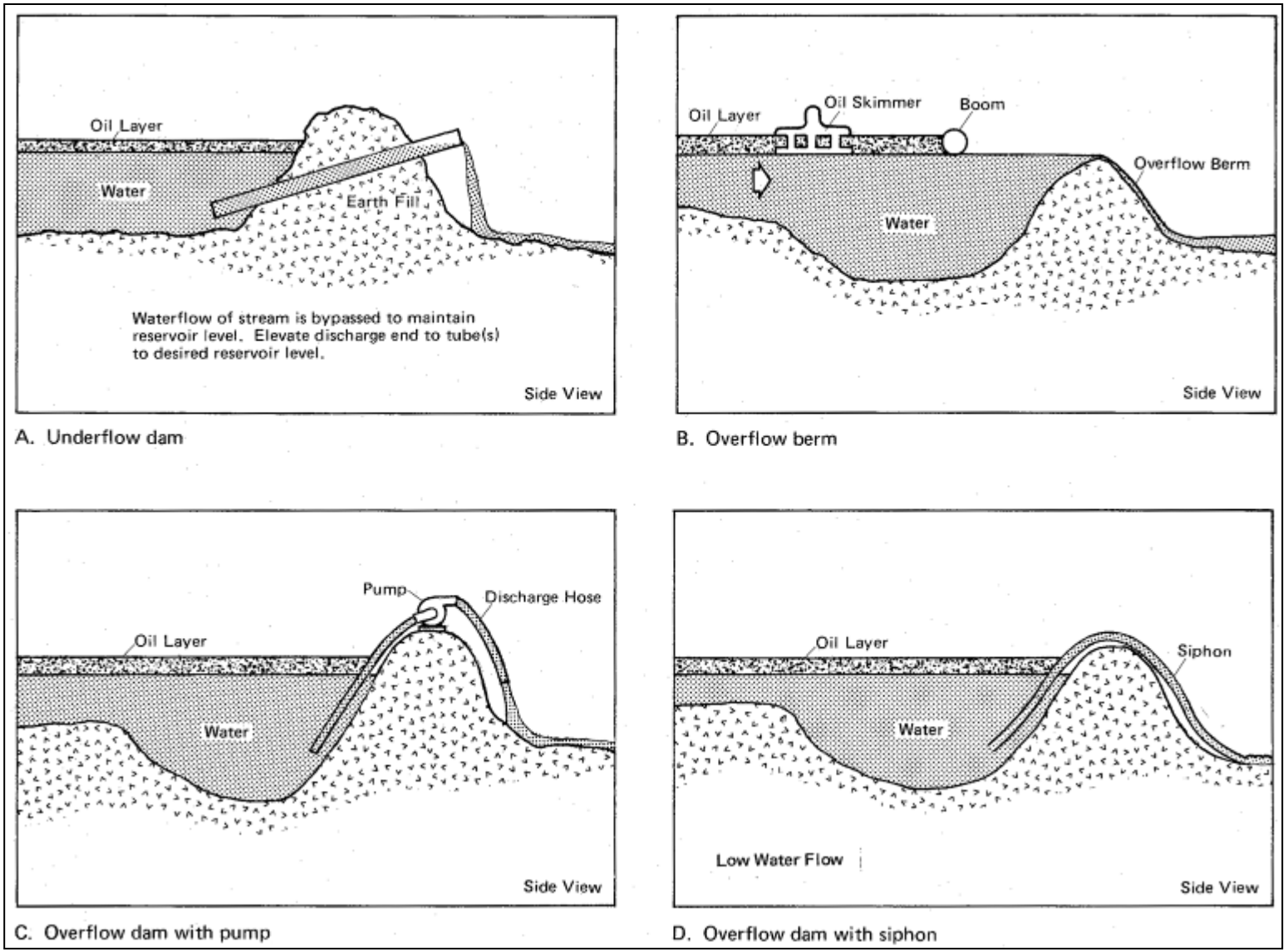


FIGURE D-2: FLOWING WATER DAMS

D.2.3 Sorbent Booms and/or 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 D-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.

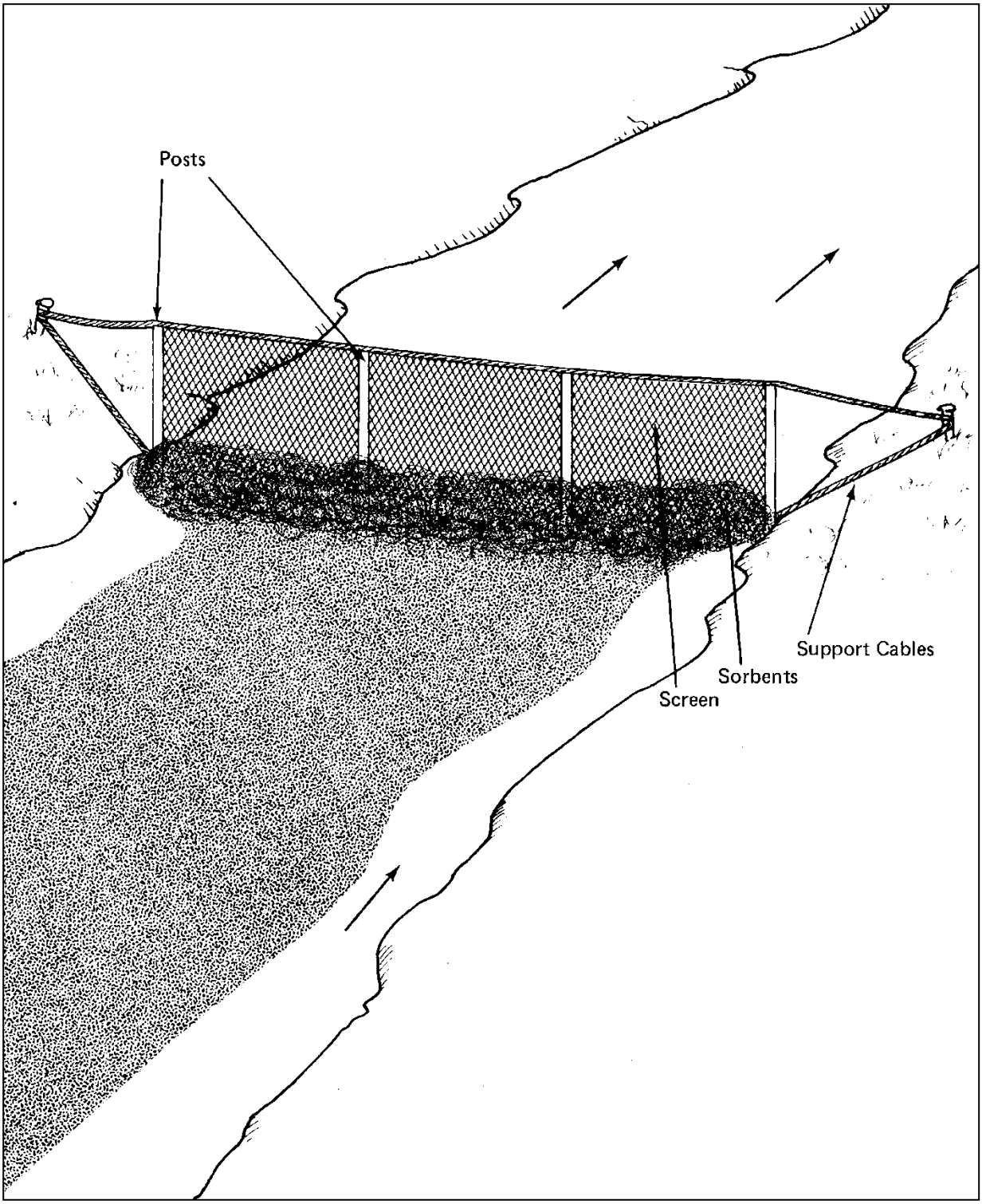


FIGURE D-3: SORBENT BARRIER

D.2.4 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 D-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.

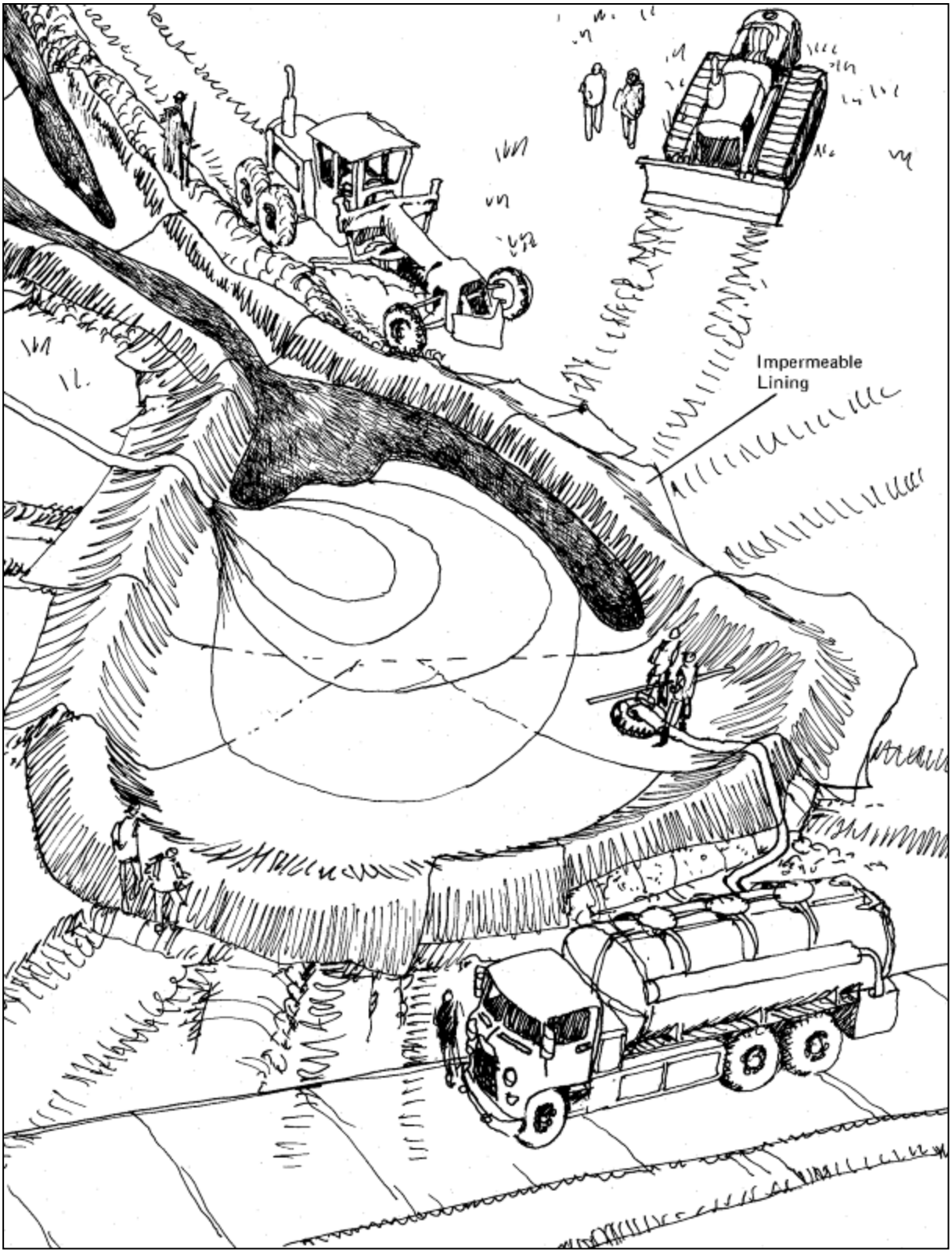


FIGURE D-4: EARTHEN CONTAINMENT BERMS

D.3 HAZARDOUS SUBSTANCE SPILL RESPONSE, CONTAINMENT, AND CLEANUP

D.3.1 Basic/Caustic Substances

Emergency

1. Make initial notification identified in the Core Plan and Appendix A.
2. If a chemical gets in a victim's eyes, flush the eyes using an eye wash unit for 15 minutes. Transport the victim to the nearest Emergency Medical Center, as appropriate.
3. Remove contaminated clothing, Wash skin for 15 minutes by having the victim stand under an emergency shower. Transport the victim to the nearest Emergency Medical Center.
4. Be prepared to tell the doctor what chemicals are involved.

Spill Containment - Enclose spilled caustic with a dike of solid absorbent (sawdust, vermiculite, or clay).

Clean-up - Scoop up spent solid absorbent material with a non-sparking shovel or scoop with a long handle. Place in the proper spent waste container. The waste container should be properly labeled.

Container - Rubber or plastic.

Personal Protective Equipment - Spilled caustics are very slippery. Care must be taken to avoid falls. Employees involved in cleaning up spills must wear the appropriate protective clothing and equipment.

Fire Extinguishers - Use water spray, dry chemical, or carbon dioxide extinguishers.

D.3.2 Acidic Substances

Emergency

1. Make initial notification identified in the Core Plan and Appendix A.
2. If a victim ingests an acid or breathes the acid mists, transport the victim to the nearest Emergency Medical Center.
3. If a victim has acid spilled on him/her, provide immediate treatment by using the nearest eye wash or shower as appropriate and then transport the victim to nearest Emergency Medical Center, as appropriate. Take off any clothing that acids have contaminated.
4. Be prepared to tell the doctor what chemicals are involved.

Spill Containment - Enclose spilled acid with a dike of clay absorbent.

Clean-up - Add sawdust or clay until the acid and sodium are completely covered. Scoop up spent solid absorbent material with a non-sparking shovel with a long handle. Place spent waste in the proper container. The waste container should be properly labeled.

Container - Plastic or rubber.

Personal Protective Equipment - Employees involved in cleaning up an acid spill must wear the appropriate protective clothing and equipment.

Fire Extinguishers - Use water spray, dry chemical, or carbon dioxide extinguishers.

D.3.3 Oxidizers and Organic Peroxides

Emergency

1. Make initial notification identified in the Core Plan and Appendix A.
2. Body areas that have been in contact with chemicals should be flushed with water at once. Clothing that has chemicals on it should be removed at once. Transport the victim to the nearest Emergency Medical Center, as appropriate.
3. Contact with eyes: Wash thoroughly with water for fifteen minutes and transport the employee to the nearest Emergency Medical Center, as appropriate.
4. Taken internally: Transport the victim to the nearest Emergency Medical Center.
5. Be prepared to tell the doctor the chemicals involved.

Spill containment - Enclose spilled oxidizers with a dike of clay or talc (absorbent).

Clean-up - Add absorbent until the oxidizer is completely absorbed. Scoop up spent absorbent with a non-sparking shovel or scoop with a long handle. Place absorbent material in the proper waste container. The waste container should be properly labeled.

Container - Plastic or rubber lined with heavy plastic so it will not leak.

Personal Protective Equipment - Oxidizers and organic peroxides are extremely hazardous and readily combustible if mixed with organic compounds and will react with each other. Employees involved in cleaning-up spills must wear the appropriate protective clothing and equipment.

Fire Extinguishers - Dry chemical extinguishers should be used to fight fires. Separate the oxidizers from sources of ignition and avoid heating. Use water spray on combustible materials near the fire.

D.3.4 Flammable and Combustible Organic Liquids

Emergency:

1. Make initial notification identified in the Core Plan and Appendix A.
2. Skin contact: All clothing contaminated with chemicals must be removed at once, including rubber footwear and should be thoroughly washed with plenty of water for at least fifteen minutes. The skin should be washed with soap and water, and the victim transported to the nearest Emergency Medical Center, as appropriate.
3. Inhalation or taken internally: Transport the employee to the nearest Emergency Medical Center at once.
4. Eyes: Irrigate the eyes for 15 minutes and transport the victim to the nearest Emergency Medical Center, as appropriate.
5. Be prepared to tell the doctor what chemical(s) is/are involved.

Spill Containment - Enclose spilled organic liquid with a dike of sawdust or sweeping compound (solid absorbent).

Clean-up - Use enough absorbent to soak up the spilled liquid. Since most organic liquids are very flammable, avoid sources of ignition or SPARKING. Scoop up spent solid absorbent with a non-sparking shovel or scoop with a long handle. Place absorbent in the proper waste container. Waste container should be properly labeled.

Container - Metal with plastic liner.

Personal Protective Equipment - Vapors heavier than air tend to accumulate in low places; avoid having flammable vapors come in contact with ignition sources to prevent flashback. Employees involved in cleaning-up a spill must wear the appropriate protective clothing and equipment.

Fire Extinguishers - Carbon dioxide and dry chemical type. In case of fire call the Fire Department, cool nearby drums with a hose stream of water to prevent ignition and the possibility of pressure increase in the containers.

D.3.5 Pesticides

Emergency:

1. Make initial notification identified in the Core Plan and Appendix A.
2. Identify the pesticide involved in the spill. If contamination of personnel has occurred, remove contaminated clothing. Wash skin for 15 minutes and report to the nearest Emergency Medical Center, as appropriate.
3. If pesticides are spilled in the eyes, wash in the eye bath for 15 minutes and report to the nearest Emergency Medical Center, as appropriate.
4. If there are any signs of dizziness, upset stomach, etc., report to the nearest Emergency Medical Center at once.
5. When going to the Emergency Medical Center, take the names of the pesticides you have been using with you.
6. Secure the spill site from entry by unauthorized personnel by roping off the area and posting warning signs.

Spill Containment - Enclose liquid spills with a dike of absorbent (e.g., sawdust, clay, or vermiculite). If the pesticide container is still leaking, place the leaking container in a suitable overpack drum or comparable container to prevent further spillage.

Clean-up - Add more absorbent if necessary. Scoop up spent solid absorbent and place in proper waste container.

Containers - Plastic or metal with plastic liner.

Personal Protective Equipment - Employees involved in cleaning-up spills must wear the appropriate protective clothing and equipment.

Fire Extinguishers - None. Evaluate and call the Fire Department.

APPENDIX E
PORT ALLEN SPILL RESPONSE STRATEGIES

E.1 INTRODUCTION

The PMRF harbor facility is located at Port Allen, a state commercial harbor located approximately 20 miles southeast of PMRF. The Navy currently berths two 97' Multi-Purpose Crafts (MPC's) at the commercial pier at the harbor (see Figure E-1). The vessels support range operations from PMRF.

The Port Allen Marine Department currently fuels the Navy vessels pier-side using one of two 5,000-gallon capacity tanker trucks. The tanker trucks are driven onto the pier and fuel is pumped directly to the vessel's fuel tanks via a fuel hose. Fueling can occur at any time day or night. Tanker trucks never carry more than 4,000-gallons while refueling. Perma-boom (100 feet) along the pier is used to boom vessels during fueling. Plans are in progress to purchase and install perma-boom for the length of the Navy leased pier space.

Because of the high risk of a discharge during fueling operations, and of the likelihood of any discharge reaching the ocean, this appendix on spill response strategies was developed. The following sections discuss oil spill response equipment, prevailing wind and currents, on-water response strategies, slick movement predictions, sensitive areas, and pictures of relevant sites.

Any spill onto navigable waters must be reported immediately to the NRC, the NOSC, and state and local authorities. See Appendix A for details on notification requirements and contact information.

Figure E-1: Navy Vessels at Port Allen

E.2 OIL SPILL RESPONSE EQUIPMENT

The PMRF Marine Department has the capability to respond to small to moderate oil spills in Port Allen using the oil spill response equipment listed in Table E-1. All equipment listed is located at Port Allen and is accessible on a 24-hour basis. 150 feet of response boom is pre-staged on the pier, this boom can be deployed within 30 minutes during working hours.

TABLE E-1: PORT ALLEN OIL SPILL RESPONSE EQUIPMENT

Equipment	Number/Stocking Goal
Semi-Rigid Inflatable Boat (RIB) + Trailer	1
2007 - 19' Work Skiff	1
1994 - 19' Boston Whaler + Trailer	1
Slickbar Permanent Boom	150 Feet
Class II Response Boom	2500 Feet
Boom Mooring Systems	4
Kvichak Marine Boom Roller	1
2009 - Isometrics Vacuum Truck - 1,800 gallon	1
2008 - Douglas Environmental Portable Skimmer	1
Bales of Absorbent Pads	7
Bales of Sweeps	10
Boxes of 8’ and 5' Absorbent Booms	4 each
Boxes of 5’ Mini Booms	2
Boxes of Pompoms	10
Point of Contact: O&M Marine Supervisor, 634-9816	

E.3 PREVAILING WIND AND CURRENT AT PORT ALLEN

The prevailing wind at Port Allen is out of the northeast and would be the dominant factor in moving any spilled oil in the harbor. The harbor and bay are very exposed with a prominent tidal surge. The prevailing winds and currents would quickly move any spilled oil towards the southwest into Hanapepe Bay and out to sea. Because of the prominent tidal surge and exposed nature of the bay, any oil that made it out into the bay would be extremely difficult to contain and recover. See Section E.5 for guidelines in predicting slick movement.

E.4 ON-WATER RESPONSE STRATEGIES

The most probable spill would occur during the fueling of one of the Navy vessels pier-side. As discussed in Section E.3, any spilled fuel would quickly move out into Hanapepe Bay heading out to sea. Due to the estimated response time of approximately 30 minutes, any released fuel would be well out into the bay by the time the Port Allen Spill Response Team (SRT) could deploy response equipment.

On-water booming strategies would be two-fold. First, to capture the oil in the bay by deploying boom in a U-shape configuration and bringing it nearshore to collect with a vacuum truck and

weir skimmer (Strategy A). Second, to deploy deflection boom to protect both the small boat harbor and the surrounding rocky shoreline (Strategy B).

E.4.1 Containment of Oil Released During Fueling Operations (Strategy A)

The SRT will deploy two boats and the pre-staged boom on the pier and attempt to capture the released oil in Hanapepe Bay (see Figure E-2). Using a "U" shaped booming configuration (strategy A1) the boats will capture the fuel and slowly bring it back to the end of the pier where it will be collected using a vacuum truck and weir skimmer (strategy A2). If the oil escapes containment the Incident Commander must contact the NOSC for further assistance as the spill will have exceeded the capabilities of the Port Allen SRT.

E.4.2 Protection of Small Boat Harbor and Rocky Shoreline (Strategy B)

In the case where a spill remains in the vicinity of the pier, due to the wind, current, and tide, the Port Allen SRT will deploy protection boom to prevent (or limit) property damage to the small boat harbor. Boom will be placed along the stone jetty and entrance of the small boat harbor which is directly opposite the commercial pier. Protective Boom will also be placed in front of the rocky shoreline between the small boat harbor and the commercial pier to minimize oil removal difficulties (see Figure E-2). This strategy must be coordinated with the Port Allen Harbor Master.

Port Allen Small Boat Harbor - Harbor Agent
335-8400 (office); 335-3953 (fax)

E.5 SLICK MOVEMENT PREDICTION

An oil slick moves by the combined forces of the wind and the current. If no wind is present, the slick will drift with the current's velocity. If wind is the only factor, the slick will move with the wind at about three percent of the wind's velocity.

Example: Suppose an oil spill occurred near the commercial pier at Port Allen. Assume the wind was 20 knots southwest and the current is 0.5 knot due west.

a. Find wind contribution to slick movement. Drift of the slick due to the wind is 3 percent of the wind speed or:

   (0.03) x (20 knots) = 0.60 knots

   Converting knots to feet per second:

   (0.60 nautical mile/hour) x (6,080 feet/nautical mile) = 3,648 feet/hour

   Assuming a response time of 30 minutes, the slick will move under the influence of the wind alone 1,824 feet southwest from the spill site.

b. Find current contribution to slick movement. The slick moves with the current at the same speed and direction as the current. With the current moving at 0.5 knots to the west, in 15 minutes, the slick will move:

   (0.5 nautical mile/hour) x (6080 feet/nautical mile) x (1/2 hour) = 1,520 feet

c. Find the resultant movement of the slick. A scaled line approximately 1,824 feet southwest is drawn from the spill source or "starting point" of the slick. At this same point, a line 1,520 feet long is drawn due west from the direction of the spill. These lines are "added" together to form a resultant or combined movement of the spill due to both wind and current forces.

In the 30-minutes time, given these wind and current conditions, this spill would be well into Hanapepe Bay. To mitigate the threat posed to the bay and sensitive areas it is essential that response assets are quickly deployed.

E.6 BOOM REQUIREMENTS

The PMRF Marine Department has 2,500 feet of response boom available to respond to spills within Port Allen, which is sufficient to implement all of the booming strategies described in Section E.4. 150 feet of this boom is pre-staged at the end of the pier for rapid deployment. Additional boom, if needed, can be accessed by activating Navy SUPSALV and/or a BOA contractor via the NOSC.

E.7 BOOMING STRATEGIES MAP

Figure E-2 below depicts the booming strategies described in Section E.4. In addition, the figure identifies important sites in Hanapepe Bay such as the commercial pier, small boat harbor, oil collection point, staging areas, and boat ramps. Note that the booming strategies (identified by the letters A and B) are not drawn to scale, and do not specify exact boom locations and boom lengths. Rather, they serve as general guidelines for use during an actual response and as the basis for future refinements. All booming strategies will be refined or modified accordingly based on the experience gained from future training, drills and actual response to spills.

E.8 SENSITIVE AREAS

Much of the shoreline around Hanapepe Bay consists of steep cliffs, exposed tidal/reef flats, boulder beaches, and rip rap structures. Any release that impacted the shoreline would be very difficult to cleanup once oiled. On the northeast side of the Hanapepe Bay the Hanapepe River flow into the bay. The Hanapepe River runs through the center of the town of Eleele and has stands of mangroves along its banks.

Sensitive marine life found in the bay includes turtles, dolphins, monk seals, and whales. In addition the Hawaiian Stilt and Duck (both endangered/protected species) can be found in the Salt Ponds beyond the airport on the southwest side of Hanapepe Bay. Figure E-3 is taken from the Hawaii Area Contingency Plan, and details the sensitive areas within Port Allen that must be considered when implementing booming containment or protection strategies.

FIGURE E-2: PORT ALLEN ON-WATER RESPONSE STRATEGIES

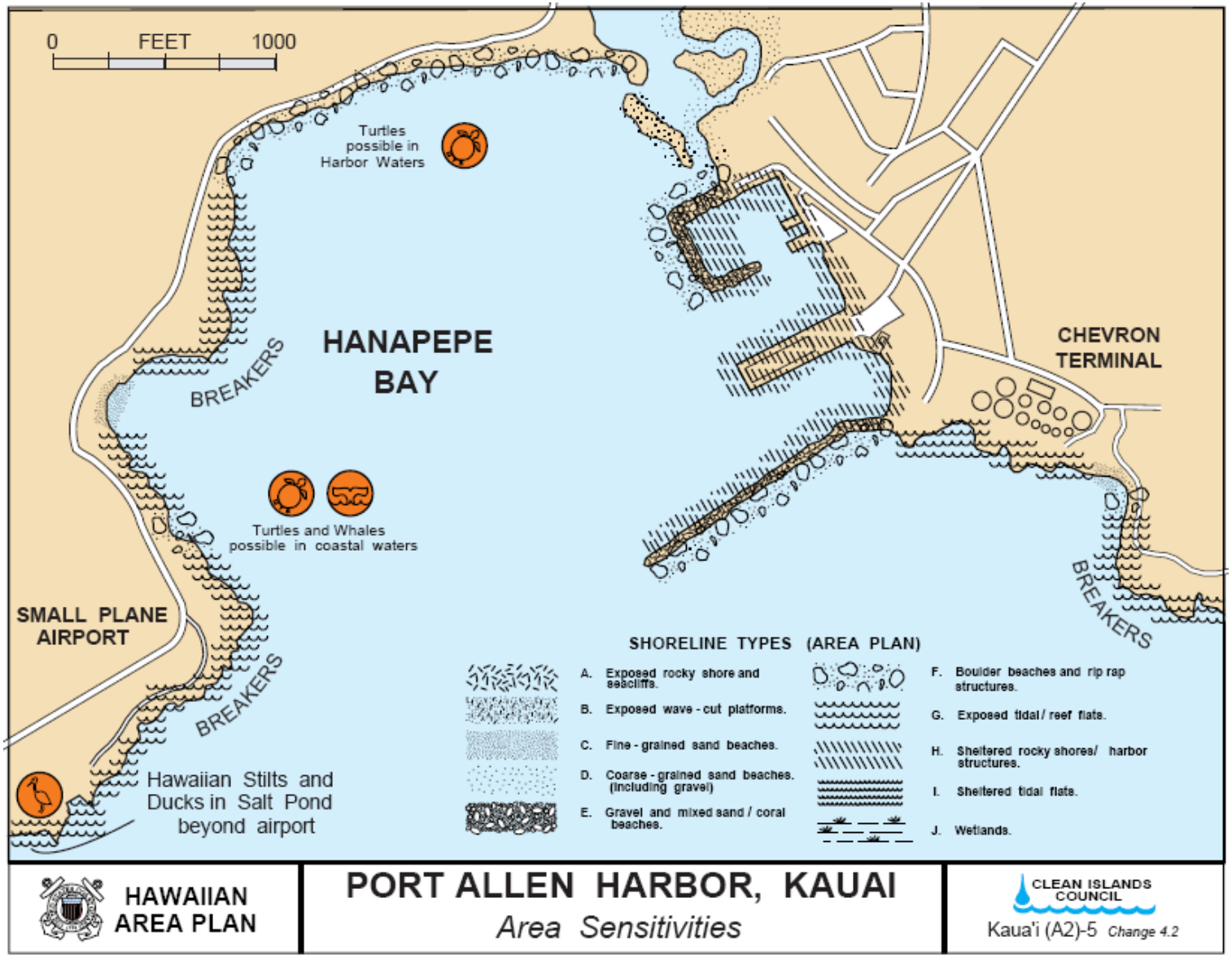


FIGURE E-3: PORT ALLEN SENSITIVE AREAS

E.9 SITE PHOTOGRAPHS

Above: Small Boat Harbor Entrance

Below: Hanapepe River

Above: Staging Area/Boat Ramp #1

APPENDIX F
CERTIFICATION OF SUBSTANTIAL HARM CRITERIA*

Facility Name Pacific Missile Range Facility, Barking Sands

Facility Address: PO Box 128, Kekaha, HI 96752

1. 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

2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and 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 within any aboveground storage tank area?

   Yes _____ No X

3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located a distance (as calculated using the appropriate formula in Attachment C-III to this appendix or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments? For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's "Guidance for Facility and Vessel Response plans: Fish and Wildlife and Sensitive Environments" (See Appendix E to this part, section 10, for availability) and the applicable Area Contingency Plan.

   Yes _____ No X

4. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located a distance (as calculated using the appropriate formula in Attachment C-III to this appendix or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?

   Yes _____ No X

5 Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years?

   Yes _____ No X

*(Attachment C-II, 40 CFR 112.20e)

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 this information, I believe that the submitted information is true, accurate, and complete.

Signature

Name (please print or type)

Title

Date

APPENDIX G
RESPONSE MANAGEMENT

G.1 INCIDENT COMMAND SYSTEM

As required by the National Contingency Plan (NCP), and to be consistent with the Federal On-Scene Coordinator (FOSC), and Hawaii Area Contingency Plan (ACP), PMRF will use an Incident Command System (ICS) Organization consistent with the National Incident Management System (NIMS) when responding to Oil and Hazardous Substance (OHS) discharges. This command system is compatible with CNRH's spill response organization and allows for improved communications and integration with the FOSC and State On-Scene Coordinator (SOSC) within a Unified Command (UC) Organization (see Figure G- 1) when activated.

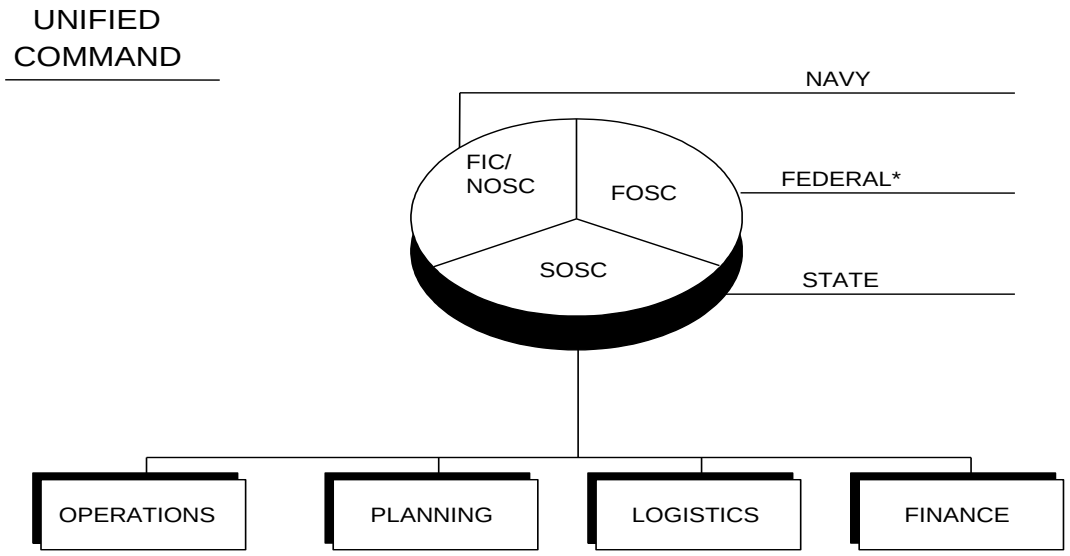


FIGURE G-1: UNIFIED COMMAND ORGANIZATION

***Note:** The FOSC is the U.S. Coast Guard for OHS spills in the coastal zone; the U.S. EPA for OHS spills in the inland zone; and the Navy for Navy HS releases (only HS, not oil), when the release is on, or the sole source from any Navy facility or vessel, including vessels bareboat chartered and operated under the jurisdiction, custody or control of DoD.

The ICS organization is designed to readily expand or contract, as required, to effectively manage a spill response. For small incidents, the functional sections may be sufficiently staffed by PMRF personnel. For large incidents a fully staffed structure using PMRF and Base Support personnel, CNRH personnel, support personnel from other Navy activities, and other federal and state agency personnel may be required.

G.2 NAVY INCIDENT MANAGEMENT

G.2.1 Organization

The Facility Commander of PMRF has the authority to obligate funds and implement complete emergency response actions at PMRF. The Facility Commander has assigned the role of Incident Commander to the PMRF Fire Chief. For spills beyond the response capabilities of

PMRF the CNRH NOSC Representative will assume the role of Incident Commander. The duties of the Incident Commander are outlined in Table G-1 in Section G.3.3.

If the NOSC Representative assumes direction of the overall response as the Incident Commander, the Facility Commander of PMRF may be assigned a staff position in the Incident Command. The identity of the Navy Incident Commander must be clear at all times to all concerned.

G.2.2 PMRF Responsibilities

If PMRF originates or discovers a spill or release, the installation is responsible for control, containment, and cleanup. Upon notification of a large spill incident, PMRF shall:

- Take immediate action to control and contain the release or spill (Core Plan).
- Make appropriate notifications (see Appendix A).
- Commence recall of the Incident Management Team (IMT).
- Activate the Emergency Operations Center (EOC).
- Implement the PMRF OHS Spill Contingency Plan. Initial priorities are:
  - (1) Ensuring personnel health and safety
  - (2) Securing the source of the spill
  - (3) Making required notifications
  - (4) Protecting sensitive areas
- Contact the NOSC Representative for assistance if the spill is beyond local capabilities.

G.2.3 NOSC Responsibilities

The NOSC Representative will act as the incident commander for OHS spills that exceed the response capability or extend beyond the fenceline of a facility located within their Area of Responsibility (AOR). In this capacity the NOSC Representative will be prepared to assume direct control of a response as the Incident Commander for any large OHS spill beyond the response capabilities of PMRF.

G.2.4 CNRH Response Organization

The CNRH Response Organization is based upon an ICS organizational structure that is shown in Figure G-2. Members of the Command Staff and the functional section chiefs are identified by name and listed, along with 24-hour phone numbers, in Appendix U of the CNRH Integrated Contingency Plan (ICP).

For large OHS spills that exceed the response capabilities of PMRF, the CNRH Regional Operations Center (ROC) will be activated to support the PMRF EOC. Through the ROC the NOSC Representative can request assistance from other local and regional Navy assets. In addition, the NOSC Representative can mobilize SUPSALV resources to help augment the IMT or activate a response contractor using a USCG Basic Ordering Agreement (BOA).

G.2.5 USCG Incident Management Handbook

PMRF and the CNRH IMTs will use the USCG Incident Management Handbook (IMH) to assist them in the use of NIMS ICS during large OHS spill response incidents. The IMH was designed to be an easy reference job aid for responders and provides a wealth of information on NIMS ICS. Information and guidance can be found on topics such as roles and responsibilities, the

planning cycle, meetings, briefings, ICS form, etc. An electronic version of the USCG IMH can be found at the following website:

https://www.atlanticarea.uscg.mil/Portals/7/Ninth%20District/Documents/USCG_IMH_2014_COMDTPUB_P3120.17B.pdf?ver=2017-06-14-122531-930

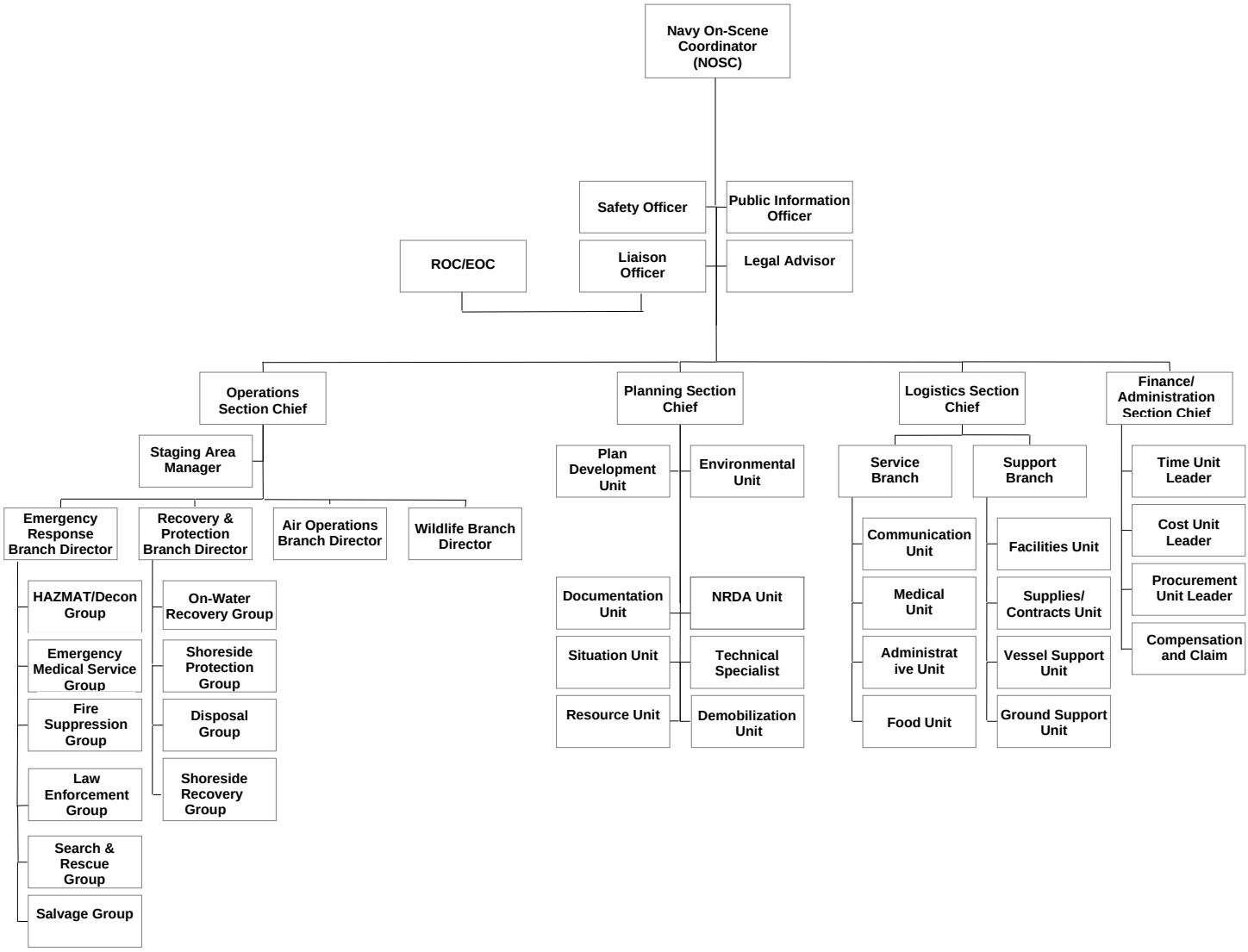


FIGURE G-2: CNRH RESPONSE ORGANIZATION

G.3 INCIDENT COMMAND SYSTEM ORGANIZATION

G.3.1 Incident Management Team

This team is organized in an ICS organizational structure and manages the spill response; it is designed to integrate into a Unified Command.

G.3.2 Unified Command

The Unified Command (see Figure G-1) is responsible for coordinating interests of the potential responsible party, federal, state and local agencies, and public and private interests to achieve strategic decision-making for spill cleanup. It jointly determines objectives, strategies, and priorities of the response. A Unified Command for an OHS spill response at PMRF would consists of the following:

- A predesignated FOSC from one of the following agencies:
  - USCG for all oil spills in the coastal zone
  - EPA for all oil spills in the inland zone
  - Department of Defense (DoD) for HS releases from DoD facilities and vessels. The CNRH NOSC Representative is the DoD designated FOSC for all Navy HS releases in the AOR.
- NOSC Representative
- A predesignated SOSC

G.3.3 Incident Commander

The Facility Commander for PMRF has assigned the role of Incident Commander to the PMRF Fire Chief. For spills beyond the response capabilities of PMRF the NOSC Representative will assume the role of Incident Commander. The Incident Commander is the Navy member of the Unified Incident Command.

The Incident Commander may designate a Deputy Incident Commander to assist in carrying out Incident Commander responsibilities. The duties of the Incident Commander and Deputy Incident Commander are listed in Table G-1.

TABLE G-1: INCIDENT COMMAND POSITION DUTIES

Incident Command System Position	Duties/Responsibilities
Incident Commander	Manage overall response operations.
	Obtain initial incident briefing from the Initial Response Team Leader.
	Determine the nature of the incident; the threat posed by the incident, and the appropriate level of response.
	Ensure that personnel safety is accorded the highest priority throughout the entire response.
	Develop strategic objectives and response priorities to guide response operations: [These objectives must be forwarded to the planning section for inclusion in Incident Action Plans.]
	Approve/authorize the implementation of Incident Action Plans.
	Serve as the primary contact with the Federal and State On-Scene Coordinators.
	Attend “Incident Command” meetings with the Federal and State On-Scene Coordinators.
	Review and approve resource allocations requested by the Section Chief.
	Monitor and evaluate the effectiveness of response operations and make adjustments to response strategies as necessary.

TABLE G-1: INCIDENT COMMAND POSITION DUTIES	
Incident Command System Position	**Duties/Responsibilities**
Incident Commander (Cont.)	Review/approve press releases and statements.
	Approve requests for outside resources
	Approve Demobilization Plan.
	Ensure that response actions are documented.
Deputy Incident Commander	Obtain the initial briefing from the Incident Commander and attend daily planning/briefing meetings.
	Coordinate the preparation of the initial incident briefing form.
	Conduct planning meeting and coordinate with the Planning Section Chief.
	Provide information on manpower, equipment, and materials for Command Staff operations to the Logistics Section Chief.
	Assist in the development of strategic objectives and response priorities.
	Coordinate the activities of the section chiefs to ensure the safe, efficient, and effective implementation of the Incident Action Plans.
	Coordinate with the Safety Officer to ensure the safety of response personnel.
	Provide regular briefings on the status of response operations.
	Ensure that each Section Chief documents the actions of their sections and that this documentation is forwarded to the Documentation Unit Leader.
	Coordinate with the Public Affairs and Government Liaison Officers to ensure that a steady, accurate flow of information is maintained.
	Coordinate rescue, salvage, and cleanup operations.
	Serve as the secondary point-of-contact for the ICS Response Organization.
	Conduct periodic surveys of the response.

G.3.4 Command Staff

For large spills beyond PMRF's capabilities, the spill will be managed by the NOSC Representative, as the Incident Commander. The Command Staff reports directly to the Incident Commander and Deputy Incident Commander. Members of the Command Staff are also available as advisors in their specialties to the functional section chiefs. The duties and responsibilities of the Command Staff in an Incident Command System are summarized below.

The ***Public Affairs Officer*** is responsible for developing and releasing information about the incident to the news media, to incident personnel, and to appropriate agencies and organizations. In a large Navy spill incident the Public Affairs Officer will initiate the establishment of a Joint Information Center (JIC). The Public Affairs Officer may head the JIC or may assign another specialist. The coordination of information release is vital to avoid public confusion and adverse impact on response/recovery operations.

The ***Legal Officer*** provides legal advice to the Incident Commander or Deputy Incident Commander on all aspects of response operations. The potential for extensive liability and numerous claims for damage requires that the Legal Officer be prepared to advise on claims filing procedures, documentation requirements, and permitting regulations. The Legal Officer provides liaison with the Office of the Judge Advocate and other Navy legal resources.
The ***Safety Officer*** is responsible for monitoring and assessing hazardous and unsafe situations and developing measures for assuring personnel safety. The Safety Officer will

correct unsafe acts or conditions through the regular line of authority, although the officer may exercise emergency authority to stop or prevent unsafe acts when immediate action is required. The Safety Officer maintains awareness of active and developing situations, ensures the preparation and implementation of the Site Safety Plan, and includes safety messages in each Incident Action Plan.

The ***Liaison Officer*** is responsible for facilitating the integration of local and statewide agency resources into the incident response organization. The Liaison Officer's function is to be a point of contact for representatives from assisting and cooperating agencies. The liaison Officer should participate in planning meetings providing updates on capabilities and limitations of assisting agency resources, provide information to local government officials, and relay information from government agency representatives to the Incident Commander and section chiefs.

G.3.5 Functional Sections

The duties and responsibilities of the functional sections in an Incident Command System are summarized below.

The ***Operations Section*** directs and coordinates all tactical operations within the response area. It assists the Planning Section in defining response goals and operational goals detailed in the incident action plan, develops mission assignments and schedules to accomplish the goals, identifies resource requirements, and, as appropriate, recommends release of resources. The Operations Section also evaluates the results of response operations.

The ***Planning Section*** is responsible for collecting and evaluating information about the incident and response. It develops action plans to accomplish stated response goals and objectives, evaluates alternative strategies and operational plans based on changing requirements, documents all response actions, and disseminates technical and environmental information to concerned parties.

The ***Logistics Section*** is responsible for supplying all resources required to carry out the response and to support continuing operations.

The ***Finance Section*** is responsible for handling all accounting services and personnel administrative matters.

G.3.6 ICS Branch/Unit Duties and Responsibilities

The number of personnel required in Operations, Planning, Logistics or Finance varies with the magnitude and circumstances surrounding the source and cause of the event. Section chiefs shall be familiar with the possible tasks that their sections might be required to perform. They will ensure that effective command and control is maintained as the organization expands. In an Incident Command organization, some section chiefs and branch chiefs may come from organizations other than the Navy.

APPENDIX H
EXERCISES, DRILLS, AND TRAINING

H.1 DRILLS AND EXERCISES

Drills and exercises are required to ensure the safety of personnel, vessels, and facilities, and to mitigate or prevent a discharge of oil or release of a hazardous substance. Personnel assigned responsibilities in this plan should be thoroughly briefed and should review this appendix as part of their job familiarization.

Per OPNAV M-5090.1, PMRF, as a non-OPA facility, must develop an exercise program that is commensurate with the complexity and risks of the facility. PMRF follows the National Preparedness for Response Exercise Program (PREP) Guidelines to satisfy this requirement. The PREP Guidelines specify that facilities conduct both internal and external drills and exercises.

H.1.1 Internal Exercises

Internal exercises are performed by personnel responsible for oil spill response and generally do not involve other members of the response community. The following drills and exercises were developed in accordance with the PREP guidelines and should be used as a reference by the exercise evaluation team when scheduling and conducting PMRF exercises. All internal exercises will be self-evaluated and self-certified by the Plan Holder who will document and maintain records of all exercises. Copies of completed documentation shall be retained on file for 5 years to document compliance.

Internal exercises will include:

- Notification exercises
- Spill Management Team (SMT) tabletop exercises
- Equipment deployment exercises

Table H-1 describes the frequency, participating elements, initiating authority, scope, objectives, and certifications of the mandatory internal exercises. Table H-2 describes the number of internal exercises that must be conducted in a triennial cycle.

H.1.2 External Exercises

External exercises extend beyond the internal focus of PMRF and include other members of the response community. External exercises will be developed to examine the Oil and Hazardous Substance (OHS) Spill Contingency Plan and the installation's ability to coordinate with the response community in conducting an effective response to a spill incident. The scenario should be typical of PMRF worst-case oil discharge, or one that could affect the local community.

H.1.3 Other Credit Issues

There are three credit issues that pertain to PMRF:

- Credit for Spill Response;
- Proper Documentation for Self-Certification; and
- LEPC Drill Credit.

TABLE H-1: INTERNAL EXERCISE			
	Notification Drill	**Tabletop Drill**	**Equipment Deployment Drill**
Frequency	Biannual	Annually	Annually
Participating Elements	Facility personnel and Incident Commander	Spill Management Team	Spill Response Team/PMRF Marine Services
Initiating Authority	Plan Holder	Plan Holder	Plan Holder
Scope	Exercise required notifications for an OHS spill.	Exercise the SMT's organization, communication, and decision-making in managing a spill response.	Deploy and operate facility owned and operated response equipment identified in the response plan. The equipment to be deployed would be either (1) the minimum amount of equipment for deployment as described in "Guiding Principles" found in the PREP Guidelines, or (2) the equipment necessary to respond to a small discharge at the facility, whichever is less. All of the facility personnel involved in equipment deployment operations must be included in a training program. All of the facility equipment must be included in a maintenance program. Credit should be taken for deployment conducted during training. The maintenance program must ensure that the equipment is periodically inspected and maintained in good operating condition in accordance with the manufacturer's recommendations and best commercial practices. The owner must document all inspection and maintenance.
Objectives	• Test required notification for a reportable OHS spill.	Exercise the SMT in a review of: • Knowledge of the response plan. • Proper notifications. • Communications system. • Ability to access the spill response contractor. • Coordination of internal organization personnel with responsibility for spill response. • An annual review of the transition from a local team to a regional team, as appropriate. • Ability to access information in the Area Contingency Plan for location of sensitive areas, resources available within the area, unique conditions of the area, etc. At least one SMT tabletop exercise in the triennial cycle should involve a worst-case discharge scenario	• Demonstrate ability of facility personnel to deploy and operate equipment. • Ensure the equipment is in proper working order
Certification	Self-certification	Self-certification	Self-certification

TABLE H-2: NUMBER OF INTERNAL EXERCISES IN A TRIENNIAL CYCLE	
Number	**Exercise Type**
6	Notification drills
3	SMT table top exercises
3	Facility-owned Equipment Deployment Exercises (for facilities with facility-owned equipment identified in their response plan).

H.1.3.1 Credit for Spill Response

PMRF will take credit for internal exercises conducted in response to actual spills. The spill response must be properly evaluated and documented.

H.1.3.2 Proper Documentation for Self-Certification

Proper documentation for self-certification will 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; and
- Lessons learned.

This documentation must be in writing and signed by the Plan Holder.

H.1.3.3 Local Emergency Planning Committees (LEPCs) Drill Credit

LEPCs are required to conduct exercises periodically. The facility should coordinate exercises with the LEPCs, whenever possible, and should take credit, as long as the PREP exercise objectives are met.

H.1.4 Completed Exercise Forms

Completed exercise forms are to be kept for a period of 5 years. The Plan Holder will retain the original documentation of all exercises for this period.

H.2 TRAINING

H.2.1 Hazardous Material (HAZMAT) Workers

Personnel employed at facilities that transfer or store products in bulk, classified as hazardous substances by the Occupational Safety and Health Administration (OSHA), must comply with Hazardous Waste Operations and Emergency Response (HAZWOPER) and Hazard Communication (HAZCOM) regulations. OSHA considers crude oil, petroleum oil, and petroleum distillates as hazardous substances.

Workers need to be trained to protect their health and to perform their normal duties in a safe manner. They must also be trained to conduct the proper regulatory and Navy notifications and emergency response procedures when a spill occurs.

H.2.2 Response Personnel

Response personnel to an oil or hazardous substance discharge will be trained to initiate site management, defensive control actions, and spill mitigation and cleanup. Response personnel will be trained to meet the minimum requirements of the First Responder Awareness, First Responder Operational, and HAZMAT Technician levels from 29 CFR 1910.120*, Hazardous Waste Operations and Emergency Response*, and to the following standards:

- 29 CFR 1910.1200, *Hazard Communication*;
- 29 CFR 1910.38, *Emergency Action Plans*;
- 49 CFR 172, Subpart H, *Training for the Safe Transportation of Hazardous Materials* (HM-126F); and,
- 40 CFR 112.21, *Facility Response Training and Drills/Exercises.*

The training outlined above will allow response personnel to meet the criteria for post-emergency response operations as outlined in 29 CFR 1910.120(q)(11) for recovery operations on facility property.

H.2.3 Training Program Elements and Procedures

No later than thirty days after assignment to the Spill Response Team, the Spill Response Team Coordinator will:

- Introduce personnel to this response plan and their responsibilities (1-hour).
- Indoctrinate personnel assigned to the Off-Shore Spill Response Team on boom deployment and response requirements and strategies (8-hour).
- Ensure all new employees receive the required training outlined in Table H-3 within 6 months from the date of employment.
- Develop and maintain a training schedule for assigned team personnel.

In addition, the Spill Response Team Coordinator will:

- Periodically evaluate and monitor knowledge and skill levels and to identify additional training needs.
- Conduct periodic refresher training.
- Maintain training records.
- Develop and maintain certifications of employee competencies and a record of the methodologies used to demonstrate competencies.

H.2.4 Response Personnel Training Requirements

All military and civilian employees with an OHS emergency response role must receive training appropriate to their role before they can take part in an actual OHS spill incident response. The specific training requirements for each response role has been outlined in Table H-3. Additional information on the training categories discussed in Table H-3 can be found in Section H.2.5.

TABLE H-3: RESPONSE PERSONNEL TRAINING REQUIREMENTS

Response Role / Employee Category	Training Categories (See Note 1)				
	1	**2**	**3**	**4**	**5**
Incident Commander	X	X			X
Senior Fire Officials	X	X	O		X
OHS Spill Response Team	X	X	X		O
Fire Protection	X	X	O		O
Explosive Ordinance Disposal	X	O	O	O	
Acute or Urgent Care/ER Staff	X				
Ambulance Service (not assigned to Fire Department)	X	X/O			
Medical Security Team	X	X/O			
Casualty Management/Patient Admin Teams	X/O	X/O			
In-Place Patient Decontamination (IPPD) Team	X	X			
Security Forces (See Note 2)	X				

Note 1:

Training Categories:
1 - First Responder Awareness Level [29 CFR 1910.120 and National Fire Protection Association (NFPA) 472].
2 - First Responder Operations Level (29 CFR 1910.120 and NFPA 472)
3 - HAZMAT Technician Level (29 CFR 1910.120 and NFPA 472)
4 - HAZMAT Specialist Level (29 CFR 1910.120 and NFPA 472)
5 - Incident Commander (29 CFR 1910.120 and NFPA 472)

Note 2:

As a minimum, security forces assigned to duties that require direct response to HAZMAT, i.e. site security, require First Responder Awareness Level training. Emergency dispatchers will receive First Responder Awareness Level training.

Key:

X Designates mandatory training
O Designates optional training
X/O Level of training depends on team duties. If a team operates in a warm zone because of mission requirements, train to First Responder Operations Level 2 (Operations)

H.2.5 OSHA Training Requirements

Table H-4 outlines the response-training plan for identified response personnel. The plan addresses USCG guidelines and OSHA training requirements in 29 CFR 1910.120 for personnel engaged in emergency response operations. Additional information follows this table.

TABLE H-4: OSHA TRAINING REQUIREMENTS

Training Category	Applicable Personnel	**Minimum** Training Required
1 - FIRST RESPONDER AWARENESS LEVEL (discovery-and-reporting-only personnel – anyone likely to witness or discover a release and trained to report releases, but who takes no further action)	Building Emergency Coordinators, watch-standers, and other personnel who routinely work with oils or hazardous substances	Sufficient hours to demonstrate the requirements identified in Section H.2.5.1 below [see OSHA Pub 3172 and 29 CFR 1910.120(q)(6)(i) for additional information]
2 - FIRST RESPONDER OPERATIONS LEVEL (defensive-response-only personnel – responders only qualified for containment and control)	Facility Response Team members (FRT)	8-hour initial emergency response training **AND** Competency in key subjects identified in Section H.2.5.2 below [see OSHA Pub 3172 and 29 CFR 1910.120(q)(6)(ii) for additional information]

TABLE H-4: OSHA TRAINING REQUIREMENTS		
Training Category	**Applicable Personnel**	**Minimum Training Required**
3 - HAZARDOUS MATERIALS TECHNICIAN LEVEL (active response personnel – responders qualified to stop release at its source by plugging, patching, etc.)	Emergency Response/Cleanup Team members	24-hour initial Operations Level Emergency Response Training **AND** Competency in key subjects identified in Section H.2.5.3 below [see OSHA Pub 3172 and 29 CFR 1910.120(q)(6)(iii) for additional information]
4 - HAZARDOUS MATERIALS SPECIALIST LEVEL (active response personnel – responders who provide support to the responding hazardous materials technician, but on a more specialized level, and to act as liaison with authorities)	Facility Emergency Response/Cleanup Team members	24-hour initial Hazardous Materials Technician Level Emergency Response Training **AND** Competency in key subjects identified in Section H.2.5.4 below [see OSHA Pub 3172 and 29 CFR 1910.120(q)(6)(v) for additional information]
5 - INCIDENT COMMANDER	Incident Commander and deputies	24-hour initial Operations Level Emergency Response Training **AND** Competency in key subjects identified in Section H.2.5.5 below [see OSHA Pub 3172 and 29 CFR 1910.120(q)(6)(v) for additional information]
6 - SKILLED SUPPORT PERSONNEL (non-HAZWOPER-trained equipment operators – skilled equipment operators not normally exposed to hazardous substances, e.g., bulldozer, backhoe, and crane operators)	As required for specific areas of the Activity	Initial briefing at site covering the topic identified in Section H.2.5.6 below [see OSHA Pub 3172 and 29 CFR 1910.120(q)(4) for additional information]
7 - SPECIALIST EMPLOYEES (HAZWOPER-trained specialists in specific substances – employees who regularly work with SPECIFIC hazardous substances and who may provide advice or assistance during response)	As required for specific areas of the Activity	Initial briefing at site covering the topic identified in Section H.2.5.7 below [see OSHA Pub 3172 and 29 CFR 1910.120(q)(5) for additional information]
8 - POST-EMERGENCY RESPONSE OPERATIONS PERSONNEL	As required for specific areas of the response	Training as outlined in Section H.2.5.8 below [see OSHA Pub 3172 and 29 CFR 1910.120(q)(11) for additional information]

Note: OSHA establishes training by type of responder, not by course, e.g., Hazardous Materials Technicians and Specialists would take the same 24-hr course, but the Specialist must have more in-depth knowledge (presumably gained by experience or other training). All personnel (except skilled support and specialist employees) must have ANNUAL refresher training or demonstration of competency (no minimum number of hours are stated

H.2.5.1 First Responder Awareness Level

First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. Training at this level provides personnel the capability to provide command and control, rescue, extinguishment and containment actions based on the conditions present. It also provides ability to identify and recognize types of hazardous substances and the risks associated with them.

As a minimum, security forces assigned to duties that require direct response to HAZMAT, i.e. site security, require First Responder Awareness Level training. Emergency dispatchers will receive First Responder Awareness Level training.

As per OSHA guidelines found in OSHA Booklet 3172, personnel receiving this training must be able to:

- Understand the hazards of oil and hazardous substances, and the risks in a spill.
- Understand what happens during an emergency involving spilled oil.
- Recognize the presence of oil or related hazardous materials in an emergency.

- Identify hazardous substances, if possible (e.g., appearance, smell, monitoring equipment, testing).
- Understand individual role in employer's emergency response plan.
- Recognize when help is needed and when to request assistance from the response team.

H.2.5.2 First Responder Operations Level

This level provides training for personnel who respond to releases or potential releases of OHS as part of an initial response to the incident for the purpose of protecting nearby persons, the environment or property from the effects of the release. First responders at the operational level are expected to respond in a defensive fashion to control the release from a safe distance and to keep it from spreading. They must know how to select and use proper personal protective equipment and know how to implement basic decontamination procedures. Personnel required to perform defensive tasks within the hot zones of an incident are required to be trained, at a minimum, to the Operations level. Operations level trained personnel are not allowed to perform any task determined to be offensive as defined by OSHA or EPA.

As per OSHA guidelines found in OSHA Booklet 3172, personnel receiving this training must be able to:

- Understand the hazards of oil and hazardous substances, and the risks in a spill.
- Understand what happens during an emergency involving spilled oil.
- Recognize the presence of oil or related hazardous materials in an emergency.
- Identify hazardous substances, if possible (e.g., appearance, smell, monitoring equipment).
- Understand individual role in employer's emergency response plan.
- Recognize when help is needed and when to request assistance from the response team.
- Know basic hazard and risk assessment techniques.
- Know how to select and use proper personal protective equipment necessary for the first responder operations level.
- Understand basic hazardous materials terms.
- Know how to perform basic control, containment, and/ or confinement operations within the capabilities of the resources and available personal protective equipment.
- Know how to implement basic decontamination procedures.
- Understand the relevant standard operating and termination procedures.

H.2.5.3 Hazardous Materials Technician Level

Individuals who respond to releases or potential releases for the purpose of controlling the release must be trained to this level. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch, or otherwise stop the release of a hazardous substance. Personnel required to perform offensive tasks at an incident are required to be trained, at a minimum, to the Technician level.

As per OSHA guidelines found in OSHA Booklet 3172, personnel receiving this training must be able to:

- Understand the hazards of oil and hazardous substances, and the risks in a spill.
- Understand what happens during an emergency involving spilled oil.
- Recognize the presence of oil or related hazardous materials in an emergency.
- Identify hazardous substances, if possible (e.g., appearance, smell, monitoring equipment).
- Understand individual role in employer's emergency response plan.

- Recognize when help is needed and when to request assistance from the response team.
- Know basic hazard and risk assessment techniques.
- Understand basic hazardous materials terms.
- Know how to perform basic control, containment, and/ or confinement operations within the capabilities of the resources and available personal protective equipment.
- Know how to implement basic decontamination procedures.
- Understand the relevant standard operating and termination procedures.
- Know how to implement the employer's emergency response plan.
- Know how to use field survey instruments and equipment to classify, identify, and verify known and unknown materials.
- Be able to function within an assigned role in the Incident Command System.
- Know how to select and use proper specialized personal protective equipment provided to the hazardous materials technician.
- Understand and be able to apply hazard and risk assessment techniques.
- Be able to perform advanced control, containment, and/or confinement operations within the capabilities of the resources and available personal protective equipment.
- Understand and implement decontamination procedures.
- Understand terminology and behavior of chemicals and their toxic effects.

H.2.5.4 Hazardous Materials Specialist Level

Individuals who respond with and provide support to hazardous materials technicians must be trained to this level. Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain.

For example, hazmat specialist personnel may supplement the installation OHS response entry into the hot or warm zone for the purpose of monitoring, detecting or sampling. For this purpose, they will be considered part of the OHS response team in the position of specialist. Personal Protective Equipment (PPE) will be selected, approved, and provided at the same level of protection as the OHS response team, using the OHS response team protocols and team equipment, to include respiratory protection for which they have been appropriately trained, fit-tested, and exercised in.

As per OSHA guidelines found in OSHA Booklet 3172, personnel receiving this training must be able to:

- Understand the hazards of oil and hazardous substances, and the risks in a spill.
- Understand what happens during an emergency involving spilled oil.
- Recognize the presence of oil or related hazardous materials in an emergency.
- Identify hazardous substances, if possible (e.g., appearance, smell, monitoring equipment).
- Understand individual role in employer's emergency response plan.
- Recognize when help is needed and when to request assistance from the response team.
- Know basic hazard and risk assessment techniques.
- Know how to select and use proper personal protective equipment necessary for the first responder operations level.
- Understand basic hazardous materials terms.
- Know how to perform basic control, containment, and/ or confinement operations within the capabilities of the resources and available personal protective equipment.
- Know how to implement basic decontamination procedures.

- Understand the relevant standard operating and termination procedures.
- Know how to implement the employer's emergency response plan.
- Know how to use field survey instruments and equipment to classify, identify, and verify known and unknown materials.
- Be able to function within an assigned role in the Incident Command System.
- Know how to select and use proper specialized personal protective equipment provided to the hazardous materials technician.
- Understand and be able to apply hazard and risk assessment techniques.
- Be able to perform advanced control, containment, and/or confinement operations within the capabilities of the resources and available personal protective equipment.
- Understand and implement decontamination procedures.
- Understand termination procedures.
- Understand terminology and behavior of chemicals and their toxic effects.
- Know how to use advanced survey instruments and equipment to classify, identify, and verify known and unknown materials.
- Understand in-depth hazard and risk techniques.
- Be able to determine and implement decontamination procedures.
- Know how to implement the local emergency response plan.
- Know the state emergency response plan.
- Be able to develop a site safety and control plan.
- Understand chemical, radiological, and toxicological terminology and behavior.
- Be able to select and use proper specialized chemical personal protective equipment provided to the hazardous materials specialist.
- Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available.

H.2.5.5 Incident Commander

Personnel who will assume control of the incident scene beyond the first responder operations level are trained to this level. The OHS Incident Commander or designated representative would also act as the site liaison with federal, state, local and other government authorities in regards to site activities.

Senior fire officials may be expected to assume command of an OHS incident.

As per OSHA guidelines found in OSHA Booklet 3172, personnel receiving this training must be able to:

- Understand the hazards of oil and hazardous substances, and the risks in a spill.
- Understand what happens during an emergency involving spilled oil.
- Recognize the presence of oil or related hazardous materials in an emergency.
- Identify hazardous substances, if possible (e.g., appearance, smell, monitoring equipment).
- Understand individual role in employer's emergency response plan.
- Recognize when help is needed and when to request assistance from the response team.
- Know basic hazard and risk assessment techniques.
- Know how to select and use proper personal protective equipment necessary for the first responder operations level.
- Understand basic hazardous materials terms.
- Know how to perform basic control, containment, and/ or confinement operations within the capabilities of the resources and available personal protective equipment.

- Know how to implement basic decontamination procedures.
- Understand the relevant standard operating and termination procedures.
- Know and be able to implement the employer's incident command system.
- Know how to implement the employer's emergency response plan.
- Know and understand the hazards and risks associated with employees working in personal protective clothing.
- Know how to implement the local emergency response plan.
- Know the state emergency response plan.
- Know and understand the importance of decontamination procedures.

H.2.5.6 Skilled Support Personnel

As discussed in 29 CFR 1910.120(q)(4), skilled support personnel are, "(p)ersonnel, not necessarily an employer's own employees, who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support work that cannot reasonably be performed in a timely fashion by an employer's own employees, and who will be or may be exposed to the hazards at an emergency response scene." As per this cite, these personnel are not required to meet the training required in these regulations for the employer's regular employees; but they must receive an initial briefing at the site prior to their participation in any emergency response. The initial briefing shall include instruction in the below topics.

- Purpose of visit or duties to be performed.
- Site personnel, chain-of-command, and communications procedures.
- Chemical/physical hazards involved and signs and symptoms of exposure.
- Emergency alarm system, escape routes, and places of refuge.
- Appropriate contamination control procedures, personal protective equipment, decontamination, and other control measures provided.

All other appropriate safety and health precautions provided to the employer's own employees shall be used to assure the safety and health of these personnel.

Note: Employees who are routinely expected to perform emergency procedures as part of their job responsibilities will be considered part of a HAZMAT team and will need to be trained in accordance with 29 CFR 1910.120 (q)(6). [OSHA's Directive CPL-02-02-073]

H.2.5.7 Specialist Employees

As discussed in 29 CFR 1910.120(q)(5), specialist employees are those, "who, in the course of their regular job duties, work with and are trained in the hazards of specific hazardous substances and are called upon to provide technical advice or assistance at the oil spill incident to the Incident Commander." They must receive the below briefing and demonstrate competency in the area of their specialization annually.

- Purpose of visit or duties to be performed.
- Site personnel, chain-of-command, and communications procedures.
- Chemical/physical hazards involved and signs and symptoms of exposure.
- Emergency alarm system, escape routes, and places of refuge.
- Appropriate contamination control procedures, personal protective equipment, decontamination, and other control measures provided.

H.2.5.8 Post-Emergency Response Operations Personnel

As discussed in 29 CFR 1910.120(q)(11), "upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards, and materials contaminated with them (such as contaminated soil or other elements of the natural environment) from the site of the incident, the employer conducting the cleanup shall comply with one of the following."

- If the employer is a contractor, then the training must meet all of the requirements of 29 CFR 1910.120 paragraphs (b) through (o).
- If the employer is the Navy, the employees are Navy or Navy Civilian personnel, and the site is on Naval property, then the employees must have completed the training requirements of the following: 29 CFR 1910.38(a); 1910.134; 1910.1200, and other appropriate safety and health training made necessary by the tasks that they are expected to perform such as personal protective equipment and decontamination procedures. All equipment to be used in the performance of the cleanup work shall be in serviceable condition and shall have been inspected prior to use.

OSHA Booklet 3172 provides four exposure categories for post-emergency response workers. These categories depend on exposure probability. Refer to OSHA Booklet 3172 for additional information.

H.2.6 On-Water Oil Spill Response Training

OSHA has promulgated training requirements in 29 CFR 1910.120 that apply to on-water oil spill cleanup operations. OSHA issued updated guidelines in OSHA Booklet 3172, *Training Marine Oil Spill Response Workers under OSHA's Hazardous Waste Operations and Emergency Response Standards*, for on-water oil spill response and cleanup. These guidelines can be found on-line at the following site:

https://www.osha.gov/publications/3172

H.2.7 Suggested Training Elements for Response Personnel

In addition to the training discussed in Sections 2.2 through 2.5, response personnel should demonstrate knowledge of the following:

- Notification procedures and requirements for facility owners or operators, internal response organizations, federal and state agencies; and contracted OHS Oil Spill Response Organizations (OSROs), and the information required for those organizations.
- Communication system used for the notifications.
- Information on the petroleum products stored, used, or transferred by facility, including familiarity with the Safety Data Sheets, special handling procedures, health and safety hazards, and spill and fire fighting procedures.
- Facility personnel responsibilities and procedures for use of facility equipment that may be available to mitigate or prevent a POL discharge.
- Drill and exercise to meet the federal requirements.
- The Area Contingency Plan (ACP) for the area in which the facility is located.
- The National Contingency Plan (NCP).
- Roles and responsibilities of federal and state agencies in pollution response.
- OSHA requirements for worker health and safety (29 CFR 1910.120).

- Procedures to follow in the event of discharge, potential discharge, or emergency involving the following equipment or scenarios:
  - Tank overfill.
  - Tank rupture.
  - Piping or pipeline rupture.
  - Piping or pipeline leak, both under pressure and not under pressure, if applicable.
  - Explosion or fire.
  - Equipment failure.
  - Failure of secondary containment system.
- The operational capabilities of the contracted OSRO to respond to the following:
  - Average most probable discharge (small discharge).
  - Maximum most probable discharge (medium discharge).
  - Worst-case discharge.
- General responsibilities and authorities of the Incident Commander as described in this plan.
- The organizational structure that will be used to manage the response actions, including the following:
  - Command and control.
  - Public information.
  - Safety.
  - Liaison with government agencies.
  - Spill response operations.
  - Planning.
  - Logistics support.
  - Finance.

Personnel who will be working on the water in boats to deploy the booms and clean up the OHS spill will need the following additional training:

- Safe boat handling procedures.
- Boom deployment training.

Personnel assigned to water safety, rescue, and boat fire fighting will need the following additional training:

- Safe boat handling procedures.
- Basic water safety rescue course.
- Basic fire extinguisher training.
- Towing procedures for disabled boats.

Spill response team leaders and specific members of SMT require specialized training to be able to provide leadership, and technical assistance to other members of the emergency response organization. These identified personnel will be trained to Level 4 (see Table H-4).

H.2.8 Suggested Training Elements for SMT Members

Personnel should be trained as SMT members and shall demonstrate knowledge of the following as appropriate to their duties and responsibilities:

- Notification procedures and requirements for facility owners or operators, internal response organizations, federal and state agencies, and contracted OHS spill removal organizations and information required for those organizations.

- Communication systems used for the notifications.
- Information on the petroleum products transferred, stored, or used by the facility, including familiarity with the Safety Data Sheets, special handling procedures, health and safety hazards, spill, and fire fighting procedures.
- Facility personnel responsibilities and procedures for use of facility equipment that may be carried to mitigate an OHS discharge/release.
- The operational capabilities of the contracted OSROs to respond to the following:
  - Average most probable discharge (small discharge);
  - Maximum most probable discharge (medium discharge); and,
  - Worst-case discharge.
- Responsibilities and authority of the Incident Commander as described in this plan.
- The organizational structure that will be used to manage the response actions, including the following:
  - Command and control;
  - Public information;
  - Safety;
  - Liaison with government agencies;
  - Spill response operations;
  - Planning;
  - Logistics support; and,
  - Finance.
- The responsibilities and duties of the SMT member within the organizational structure, in accordance with designated job responsibilities.
- The training procedures as described in the response plan for members of the SMT.
- The drill and exercise program to meet the federal and state regulations as required by Oil Pollution Act of 1990 (OPA 90).
- Procedures for the post discharge review of the plan to evaluate and validate its effectiveness.
- The National Contingency Plan.
- Roles and responsibilities of federal and state agencies in pollution response.
- Available response resources.
- Contracting and ordering procedures to acquire OSRO resources, in accordance with designated job responsibilities.
- Basic information on spill operations and OHS spill clean-up technology including the following:
  - OHS containment;
  - OSH recovery methods and devices;
  - Equipment limitations and uses;
  - Shoreline clean-up and protection;
  - Spill trajectory analysis;
  - Use of dispersants, in-situ burning, bioremediation; and,
  - Waste storage and disposal considerations.
- Hazard recognition and evaluation.
- Site safety and security procedures.
- OSHA requirements for worker health and safety (29 CFR 1910.120).
- Incident Command System and concepts for operating under a Unified Command.
- Public affairs, as applicable to designated job responsibilities.
- Crisis management, as applicable to designated job responsibilities.
- Personnel management, as applicable to designated job responsibilities.

- Emergency petroleum product transfer procedures, as applicable to designated job responsibilities.
- Sensitive biological areas, as applicable to designated job responsibilities.
- Procedures for directing the deployment and use of spill response equipment, as applicable to designated job responsibilities.

H.2.9 Oil Handling Personnel Training and Discharge Prevention Briefings

Per 40 CFR 112.7 (f)(1) all oil-handling personnel must be trained in the following: operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution control laws, rules, and regulations; general facility operations; and the contents of the facility SPCC plan.

Discharge prevention briefings (40 CFR 112.7 (f)(3)) must be conducted for all oil-handling personnel at least once a year to assure adequate understanding of the facility SPCC plan. Such briefings must highlight and describe known discharges or failures, malfunctioning components, and any recently developed precautionary measures.

H.2.10 Training Information

The Naval Safety and Environmental Training Center (NAVSAFENVTRACEN) is the training lead for Navy response personnel. The center's training catalog provides a complete listing of Navy response training courses. Available courses, including class dates, locations, personnel size, etc. can be found at:

https://navalsafetycenter.navy.mil/Learning/NAVSAFENVTRACEN/Course-Schedule/

Navy response training courses available from NAVSAFENVTRACEN include:

- OHS Spill Response Tabletop Exercise (CIN: A-493-2501)
- Facility Response Team Three Day Training (CIN: A-493-0013)
- Facility Response Team Five Day Training (CIN: A-493-0012)
- Hazardous Substance Incident Response Management Training (CIN: A-493-0077)
- Incident Command System 300 (CIN: A-493-2300)

HAZWOPER training for response personnel is provided by the Naval Civil Engineer Corps Officer School (CECOS). Information on their "HAZWOPER for Uncontrolled Hazardous Waste Site Worker" and refresher courses can be found at:

http://www.denix.osd.mil/cecos/er/hazwope-ref/

FEMA's Emergency Management Institute (EMI) offers many NIMS Incident Command System (ICS) courses as self-paced web-based courses, including ICS 100 and 200. FEMA's EMI site can be found at:

http://training.fema.gov/IS/NIMS.asp

H.2.10.1 Other Suggested Training

Other suggested training for response personnel include:

- Shoreline Cleanup Assessment Team
- Aerial Observer
- Science of Oil Spills
- HAZCAT
- Air Monitoring

H.2.11 Training Documentation

PMRF is required to maintain training documentation that certifies employee's competency. Training documentation for Navy civilians is accomplished according to applicable PMRF instructions. Training documentation for Navy contractors is accomplished according to their contract with the Navy.

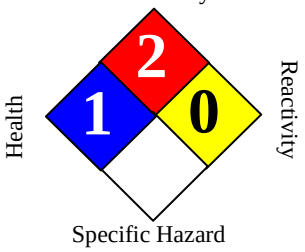
This Page Intentionally Left Blank.

APPENDIX I
SAFETY DATA SHEETS

This Page Intentionally Left Blank.

Safety Data Sheet
Jet Fuel

NFPA:



SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Jet Fuel			
Synonyms	:	Jet Fuel - A, B, A-I, A-50, High Sulfur, Military, Jet A & B Aviation Turbine Fuel, Jet A-I, Jet A; Avjet For Blending; Jet Q Turbine Fuel, Aviation Fuel; Turbine Fuel; JP-4; JP-5; JP-8, Av-Jet, 888100004452			
SDS Number	:	888100004452	**Version**	:	2.15
Product Use Description	:	Fuel			
Company	:	For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway, San Antonio, TX 78259			
Tesoro Call Center	:	(877) 783-7676	**Chemtrec (Emergency Contact)**	:	(800) 424-9300

SECTION 2. HAZARDS IDENTIFICATION

Classifications : Flammable Liquid – Category 3
Aspiration Hazard – Category 1
Skin Irritation – Category 2
Specific Target Organ Toxicity (Single Exposure) – Category 3
Chronic Aquatic Toxicity – Category 2

Pictograms

Signal Word : **Danger**

Hazard Statements : Flammable liquid and vapor.
May be fatal if swallowed and enters airways – do not siphon by mouth.
Causes skin irritation. Repeated or prolonged skin contact can cause skin irritation and dermatitis.
May cause drowsiness or dizziness by inhalation.
May cause irritation of respiratory system.
Toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention	Keep away from heat, sparks, open flames, welding and hot surfaces. No smoking. Keep container tightly closed. Ground and/or bond container and receiving equipment. Use explosion-proof electrical equipment. Use only non-sparking tools if tools are used in flammable atmosphere. Take precautionary measures against static discharge. Wear gloves, eye protection and face protection as needed to prevent skin and eye contact with liquid. Wash hands or liquid-contacted skin thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe vapors or mists. Use only outdoors or in a well-ventilated area.
Response	In case of fire: Use dry chemical, CO2, water spray or fire fighting foam to extinguish. If swallowed: Immediately call a poison center, doctor, hospital emergency room, medical clinic or 911. Do NOT induce vomiting. Rinse mouth. If skin irritation persists, get medical attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. Get medical attention if you feel unwell.
Storage	Store in a well ventilated place. Keep cool. Store locked up. Keep container tightly closed . Use only approved containers.
Disposal	Dispose of contents/containers to approved disposal site in accordance with local, regional, national, and/or international regulations.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Kerosene (petroleum)	8008-20-6	100%
Naphthalene	91-20-3	0 to 3%
Ethyl Benzene	100-41-4	0 to 1%
Trimethy Benzene	95-63-6	0 to 1%
Ethyl Benzene	100-41-4	0 to 1%

SECTION 4. FIRST AID MEASURES

Inhalation	:	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.
Skin contact	:	Take off all contaminated clothing immediately. Wash off immediately with soap and plenty of water. Wash contaminated clothing before re-use. If skin irritation persists, seek medical attention.
Eye contact	:	In case of eye contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek medical attention

immediately.

Ingestion : Do NOT induce vomiting. Do not give liquids. Seek medical attention immediately. If vomiting does occur naturally, keep head below the hips to reduce the risks of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

Notes to physician : Symptoms: Aspiration may cause pulmonary edema and pneumonitis. Treatment: Do not induce vomiting, use gastric lavage only. Remove from further exposure and treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Carbon dioxide (CO2), Water spray, Dry chemical, Foam, Keep containers and surroundings cool with water spray., Do not use a solid water stream as it may scatter and spread fire., Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Specific hazards during fire fighting : Fire Hazard. Do not use a solid water stream as it may scatter and spread fire. Cool closed containers exposed to fire with water spray. Sealed containers may rupture when heated. Above the flash point, explosive vapor-air mixtures may be formed. Vapors can flow along surfaces to distant ignition source and flash back.

Special protective equipment for fire-fighters : Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Further information : Exposure to decomposition products may be a hazard to health. Standard procedure for chemical fires.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions : ACTIVATE FACILITY'S SPILL CONTINGENCY OR EMERGENCY RESPONSE PLAN if applicable. Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Environmental precautions : Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Methods for cleaning up : Take up with sand or oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling : Keep away from fire, sparks and heated surfaces. No smoking near areas where

material is stored or handled. The product should only be stored and handled in areas with intrinsically safe electrical classification.

: Hydrocarbon liquids including this product can act as a non-conductive flammable liquid (or static accumulators), and may form ignitable vapor-air mixtures in storage tanks or other containers. Precautions to prevent static-initated fire or explosion during transfer, storage or handling, include but are not limited to these examples:

(1) Ground and bond containers during product transfers. Grounding and bonding may not be adequate protection to prevent ignition or explosion of hydrocarbon liquids and vapors that are static accumulators.
(2) Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such gasoline or naphtha).
(3) Storage tank level floats must be effectively bonded.

For more information on precautions to prevent static-initated fire or explosion, see NFPA 77, Recommended Practice on Static Electricity (2007), and API Recommended Practice 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents (2008).

Conditions for safe storage, including incompatibilities : Keep away from flame, sparks, excessive temperatures and open flame. Use approved containers. Keep containers closed and clearly labeled. Empty or partially full product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. The storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

: Keep away from food, drink and animal feed. Incompatible with oxidizing agents. Incompatible with acids.

: Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

List	Components	CAS-No.	Type:	Value
OSHA Z1	Naphthalene	91-20-3	PEL	10 ppm 50 mg/m3
	Ethyl Benzene	100-41-4	PEL	100 ppm 435 mg/m3
ACGIH	Naphthalene	91-20-3	TWA	10 ppm
		91-20-3	STEL	15 ppm
	Kerosene (petroleum)	8008-20-6	TWA	200 mg/m3
	Ethyl Benzene	100-41-4	TWA	100 ppm 434 mg/m3
			STEL	125 ppm 543 mg/m3

Protective measures : Keep out of reach of children.

Engineering measures : Use only intrinsically safe electrical equipment approved for use in classified areas. Emergency eye wash capability should be available in the vicinity of any potential

splash exposure.

Eye protection	:	Goggles and face shield as needed to prevent eye and face contact.
Hand protection	:	Gloves constructed of nitrile, neoprene, or PVC are recommended.
Skin and body protection	:	Chemical protective clothing such as DuPont TyChem ®, Barricade or equivalent, recommended based on degree of exposure. Consult manufacturer specifications for further information.
Respiratory protection	:	NIOSH/MSHA approved positive-pressure self-contained breathing apparatus (SCBA) or Type C positive-pressure supplied air with escape bottle must be used for gas concentrations above occupational exposure limits, for potential of uncontrolled release, if exposure levels are not known, or in an oxygen-deficient atmosphere.
Work / Hygiene practices	:	Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Clear to straw colored liquid
Odor		Characteristic petroleum or kerosene-like odor
Odor threshold		0.1 - 1 ppm typically reported
pH		Not applicable
Melting point/freezing point		Gel point can be about -15°F; freezing requires laboratory conditions
Initial boiling point & range		154 - 372 °C (310° - 702 °F)
Flash point		38°C (100°F) Minimum
Evaporation rate		Higher initially and declining as lighter components evaporate
Flammability (solid, gas)		Flammable vapor released by liquid
Upper explosive limit		5.0 %(V)
Lower explosive limit		0.7 %(V)
Vapor pressure		< 2 mm Hg at 20 °C
Vapor density (air = 1)		> 4.5
Relative density (water = 1)		0.8 g/mL
Solubility (in water)		0.0005 g/100 mL
		3.3 to 6 as log Pow

Partition coefficient (n-octanol/water)	
Auto-ignition temperature	210 °C (410°F)
Decomposition temperature	Will evaporate or boil and possibly ignite before decomposition occurs.
Kinematic viscosity	1.6 mm²/s at 40°C
Conductivity (conductivity can be reduced by environmental factors such as a decrease in temperature	Diesel Fuel Oils at terminal load rack: At least 25 pS/m Ultra Low Sulfur Diesel (ULSD) without conductivity additive: 0 pS/m to 5 pS/m ULSD at terminal load rack with conductivity additive: At least 50 pS/m JP-8 at terminal load rack: 150 pS/m to 600 pS/m

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Vapors may form explosive mixture with air. Hazardous polymerization does not occur.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	Can react with strong oxidizing agents, peroxides, acids and alkalies.
Conditions to avoid	: Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Avoid static charge accumulation and discharge (see Section 7).
Hazardous decomposition products	: Ignition and burning can release carbon monoxide, carbon dioxide, non-combusted hydrocarbons (smoke) and, depending on formulation, trace amounts of sulfur dioxide. Diesel exhaust particals may be a lung hazard (see Section 11).

SECTION 11. TOXICOLOGICAL INFORMATION

Skin irritation	: Irritating to skin. Repeated or prolonged contact can cause dryness, cracking and dermatitis. Liquid may be absorbed through skin in toxic amounts if large areas of the skin are repeatedly exposed.
Eye irritation	: May cause eye irritation.
Inhalation	Inhalation of vapors or mist may result in respiratory tract irritation and central nervous system effects including headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure and death.
Chronic Exposure	Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposure has not been determined.
Further information	: Kerosene does not have a measurable effect on human reproduction or development. Kerosene is not listed as carcinogenic by NTP, OSHA, and ACGIH. IARC has listed kerosene as a probable human carcinogen. Some petroleum distillates have been found to cause adverse reproductive effects in laboratory animals. Acute and chronic exposure to kerosene may result in CNS effects including irritability, restlessness, ataxia, drowsiness, convulsions, coma and death. The most common health effect associated with chronic kerosene exposure is dermatitis.

Component:

Kerosene (petroleum)	8008-20-6	Acute oral toxicity: LD50 rat 4 hour Dose: >5,000 mg/kg Acute dermal toxicity: LD50 rabbit Dose: >2,001 mg/kg Acute inhalation toxicity: LC50 rat Dose: >5,000 mg/l Exposure time: 4 h Skin irritation: Classification: Irritating to skin. Result: Skin irritation
Naphthalene	91-20-3	Acute oral toxicity: LD50 rat Dose: 2,001 mg/kg Acute dermal toxicity: LD50 rat Dose: 2,501 mg/kg Acute inhalation toxicity: LC50 rat Dose: 101 mg/l Exposure time: 4 h Skin irritation: Classification: Irritating to skin. Result: Mild skin irritation Eye irritation: Classification: Irritating to eyes. Result: Mild eye irritation Carcinogenicity: N11.00422130

Carcinogenicity

NTP	Naphthalene (CAS-No.: 91-20-3)
IARC	Kerosene is not listed as carcinogenic by NTP, OSHA, and ACGIH. IARC has listed kerosene as a probable human carcinogen. naphthalene (CAS-No.: 91-20-3) Kerosene (petroleum) (CAS-No.: 8008-20-6)
CA Prop 65	WARNING! This product contains a chemical known to the State of California to cause cancer. Naphthalene (CAS-No.: 91-20-3)

SECTION 12. ECOLOGICAL INFORMATION

Additional ecological information : Release 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. Naphthalene (91-20-3) one of the ingredients in this mixture is classified as a Marine Pollutant.

Component:

Naphthalene	91-20-3	Toxicity to algae: EC50 Species: Dose: 33 mg/l Exposure time: 24 h

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal : Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility.
Processing, use or contamination of this product may change the waste management options.
State and local disposal regulations may differ from federal disposal regulations.
Dispose of container and unused contents in accordance with federal, state and local requirements.

SECTION 14. TRANSPORT INFORMATION

CFR

Proper shipping name	: Fuel, aviation, turbine engine
UN-No.	: 1863
Class	: 3
Packing group	: III

TDG

Proper shipping name	: Fuel, aviation, turbine engine
UN-No.	: UN1863
Class	: 3
Packing group	: III

IATA Cargo Transport

UN UN-No.	: UN1863
Description of the goods	: Fuel, aviation, turbine engine
Class	: 3
Packaging group	: III
ICAO-Labels	: 3
Packing instruction (cargo aircraft)	: 366
Packing instruction (cargo aircraft)	: Y344

IATA Passenger Transport

UN UN-No.	: UN1863
Description of the goods	: Fuel, aviation, turbine engine
Class	: 3
Packaging group	: III
ICAO-Labels	: 3
Packing instruction (passenger aircraft)	: 355
Packing instruction (passenger aircraft)	: Y344

IMDG-Code

UN-No.	: UN 1863
Description of the goods	: Fuel, aviation, turbine engine
Class	: 3
Packaging group	: III
IMDG-Labels	: 3
EmS Number	: F-E S-E
Marine pollutant	: Yes

SECTION 15. REGULATORY INFORMATION

TSCA Status : On TSCA Inventory

DSL Status : All components of this product are on the Canadian DSL list.

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard
Fire Hazard

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIROMENT)
The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil. Fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply.

California Prop. 65 : WARNING! This product contains a chemical known to the State of California to cause cancer.

Naphthalene 91-20-3

SECTION 16. OTHER INFORMATION

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

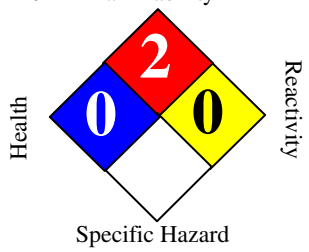
Revision Date : 11/17/2012

40, 41, 42, 43, 139, 141, 263, 1117, 1333, 1450, 1640

This Page Intentionally Left Blank.

Material Safety Data Sheet
Diesel Fuel - High Sulfur

NFPA:



HMIS III:

HEALTH	1
FLAMMABILITY	2
PHYSICAL	0

0 = Insignificant, 1 = Slight, 2 = Moderate, 3 = High, 4 = Extreme

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Diesel Fuel - High Sulfur

Synonyms : Heating Oil, Gas Oil Light Straight Run, High Sulfur Diesel Fuel #1, High Sulfur Diesel Fuel #2, Marine Diesel Fuel, F76, 888100004572

MSDS Number : 888100004572 **Version** : 2.8

Product Use Description : Fuel

Company : For: Tesoro Refining & Marketing Co.
19100 Ridgewood Parkway, San Antonio, TX 78259

Tesoro Call Center : (877) 783-7676 **Chemtrec (Emergency Contact)** : (800) 424-9300

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Regulatory status : This material is considered hazardous by the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200).

Signal Word : WARNING

Hazard Summary : Combustible Liquid

Toxic

Potential Health Effects

Inhalation : Vapors or mists from this material can irritate the nose, throat, and lungs, and can cause signs and symptoms of central nervous system depression, depending on the concentration and duration of exposure.

Eyes : Eye irritation may result from contact with liquid, mists, and/or vapors.

Skin : Skin irritation leading to dermatitis may occur upon prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed. Long-term, repeated skin contact may cause skin cancer.

Ingestion : Harmful or fatal if swallowed. Do NOT induce vomiting. This material can irritate the mouth, throat, stomach, and cause nausea, vomiting, diarrhea and restlessness. Aspiration hazard if liquid is inhaled into lungs, particularly from vomiting after ingestion. Aspiration may result in chemical pneumonia, severe

lung damage, respiratory failure and even death.

Target Organs : Kidney, Liver, Central nervous system, Eyes, Skin

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Fuels, diesel, No 2; Gasoil - unspecified	68476-34-6	100%
Naphthalene	91-20-3	1 - 5%
Xylene	1330-20-7	1 - 5%
Nonane	111-84-2	0.75 - 1%
1,2,4-Trimethylbenzene	95-63-6	0.75 - 1%
Sulfur	7704-34-9	0.5% Maximum

SECTION 4. FIRST AID MEASURES

Inhalation : Move to fresh air. Give oxygen. If breathing is irregular or stopped, administer artificial respiration. Seek medical attention immediately.

Skin contact : Take off all contaminated clothing immediately. Wash off immediately with soap and plenty of water. Wash contaminated clothing before re-use. If skin irritation persists, seek medical attention.

Eye contact : Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists, seek medical attention.

Ingestion : Do NOT induce vomiting. Ingestion may result in nausea, vomiting, diarrhea and restlessness. Aspiration may cause pulmonary edema and pneumonitis. Seek medical attention immediately.

Notes to physician : Symptoms: Dizziness, Discomfort, Headache, Nausea, Disorder, Vomiting, Lung edema, Aspiration may cause pulmonary edema and pneumonitis. Liver disorders, Kidney disorders.

SECTION 5. FIRE-FIGHTING MEASURES

Form : Liquid

Flash point : 38 ℃ (100 ℉) Minimum for #1 Diesel ; 52℃ Minimum for #2 Diesel

Lower explosive limit : 0.7 %(V)

Upper explosive limit : 5 %(V)

Suitable extinguishing media : Carbon dioxide (CO2), Water spray, Dry chemical, Foam, Keep containers and surroundings cool with water spray.

Specific hazards during fire fighting : Fire Hazard Do not use a solid water stream as it may scatter and spread fire. Cool closed containers exposed to fire with water spray.

Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus and protective suit. Use personal protective equipment.
Further information	:	Exposure to decomposition products may be a hazard to health. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions	:	Consider wind direction; stay upwind and uphill, if possible. Evacuate nonessential personnel and remove or secure all ignition sources. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact. Ensure adequate ventilation. Use personal protective equipment.
Environmental precautions	:	Carefully contain and stop the source of the spill, if safe to do so. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection. Discharge into the environment must be avoided. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up	:	Take up with sand or oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

SECTION 7. HANDLING AND STORAGE

Handling	:	Keep away from fire, sparks and heated surfaces. No smoking near areas where material is stored or handled. The product should only be stored and handled in areas with intrinsically safe electrical classification.
Advice on protection against fire and explosion	:	Hydrocarbon liquids including this product can act as a non-conductive flammable liquid (or static accumulators), and may form ignitable vapor-air mixtures in storage tanks or other containers. Precautions to prevent static-initated fire or explosion during transfer, storage or handling, include but are not limited to these examples: (1) Ground and bond containers during product transfers. Grounding and bonding may not be adequate protection to prevent ignition or explosion of hydrocarbon liquids and vapors that are static accumulators. (2) Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such gasoline or naphtha). (3) Storage tank level floats must be effectively bonded. For more information on precautions to prevent static-initated fire or explosion, see NFPA 77, Recommended Practice on Static Electricity (2007), and API

Recommended Practice 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents (2008).

Dust explosion class : Not applicable

Requirements for storage areas and containers : Keep away from flame, sparks, excessive temperatures and open flame. Use approved containers. Keep containers closed and clearly labeled. Empty or partially full product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. The storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

Advice on common storage : Keep away from food, drink and animal feed. Incompatible with oxidizing agents. Incompatible with acids.

Other data : No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

List	Components	CAS-No.	Type:	Value
OSHA Z1	Naphthalene	91-20-3	PEL	10 ppm 50 mg/m3
	Xylene	1330-20-7	PEL	100 ppm 435 mg/m3
ACGIH	Diesel Fuel	68476-30-2	TWA	100 mg/m3
ACGIH	Naphthalene	91-20-3	TWA	10 ppm
		91-20-3	STEL	15 ppm
	Xylene	1330-20-7	TWA	100 ppm
		1330-20-7	STEL	150 ppm
	Nonane	111-84-2	TWA	200 ppm

Engineering measures : Use only intrinsically safe electrical equipment approved for use in classified areas.

Eye protection : Safety glasses with side-shields reference to 29 CFR 1910.133

Hand protection : Gloves constructed of nitrile, neoprene, or PVC are recommended. Consult manufacturer specifications for further information.

Skin and body protection : If needed to prevent skin contact, chemical protective clothing such as of DuPont TyChem®, Saranex or equivalent recommended based on degree of exposure. The resistance of specific material may vary from product to product as well as with degree of exposure.

Respiratory protection	:	A NIOSH/ MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection. NIOSH/MSHA approved positive-pressure self-contained breathing apparatus (SCBA) or Type C positive-pressure supplied air with escape bottle must be used for gas concentrations above occupational exposure limits, for potential of uncontrolled release, if exposure levels are not known, or in an oxygen-deficient atmosphere.
Work / Hygiene practices	:	Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form	:	Liquid
Appearance	:	Clear, straw colored
Odor	:	Characteristic petroleum (kerosene) odor
Flash point	:	38 °C (100 °F) Minimum for #1 Diesel ; 52°C Minimum for #2 Diesel
Thermal decomposition	:	No decomposition if stored and applied as directed.
Lower explosive limit	:	0.7 %(V)
Upper explosive limit	:	5 %(V)
Freezing point	:	Not applicable
Boiling point	:	160 °C(320 °F)
Vapor Pressure	:	<2mm Hg at 20°C at 20 °C (68 °F)
Relative Vapor Density	:	5.7 (Air = 1.0)
Water solubility	:	Negligible
Percent Volatiles	:	100 %
Conductivity (conductivity can be reduced by environmental factors such as a decrease in temperature)		Diesel Fuel Oils at terminal load rack: At least 25 pS/m Ultra Low Sulfur Diesel (ULSD) without conductivity additive: 0 pS/m to 5 pS/m ULSD at terminal load rack with conductivity additive: At least 50 pS/m but conductivity may decrease from environmental factors such as temperature drop. JP-8 at terminal load rack: 150 pS/m to 600 pS/m

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	:	Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers. Viton ® ; Fluorel ®
Materials to avoid	:	Strong oxidizing agents Peroxides
Hazardous decomposition products	:	Carbon monoxide, carbon dioxide and noncombusted hydrocarbons (smoke). Diesel exhaust particulates may be a lung hazard - see Section 11.
Thermal decomposition	:	No decomposition if stored and applied as directed. No decomposition if used as directed.
Hazardous reactions	:	Keep away from oxidizing agents, and acidic or alkaline products.

SECTION 11. TOXICOLOGICAL INFORMATION

Carcinogenicity

NTP	:	Naphthalene (CAS-No.: 91-20-3)
IARC	:	Naphthalene (CAS-No.: 91-20-3)
OSHA	:	No component of this product which is present at levels greater than or equal to 0.1 % is identified as a carcinogen or potential carcinogen by OSHA.
CA Prop 65	:	WARNING! This product contains a chemical known to the State of California to cause cancer. Naphthalene (CAS-No.: 91-20-3)
Skin irritation	:	Irritating to skin.
Eye irritation	:	Irritating to eyes.
Further information	:	Studies have shown that similar products produce skin cancer or skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation. Positive mutagenicity results have been reported. Repeated over-exposure may cause liver and kidney injury IARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A). NIOSH regards whole diesel fuel exhaust particulates as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

Component:

Fuels, diesel, No 2; Gasoil - unspecified	68476-34-6	Acute oral toxicity: LD50 rat Dose: 5,001 mg/kg Acute dermal toxicity: LD50 rabbit Dose: 2,001 mg/kg Acute inhalation toxicity: LC50 rat Dose: 7.64 mg/l Exposure time: 4 h Skin irritation: Classification: Irritating to skin. Result: Severe skin irritation Eye irritation: Classification: Irritating to eyes. Result: Mild eye irritation
Naphthalene	91-20-3	Acute oral toxicity: LD50 rat

		Dose: 2,001 mg/kg Acute dermal toxicity: LD50 rat Dose: 2,501 mg/kg Acute inhalation toxicity: LC50 rat Dose: 101 mg/l Exposure time: 4 h Skin irritation: Classification: Irritating to skin. Result: Mild skin irritation Eye irritation: Classification: Irritating to eyes. Result: Mild eye irritation Carcinogenicity: N11.00422130
Xylene	1330-20-7	Acute oral toxicity: LD50 rat Dose: 2,840 mg/kg Acute dermal toxicity: LD50 rabbit Dose: ca. 4,500 mg/kg Acute inhalation toxicity: LC50 rat Dose: 6,350 mg/l Exposure time: 4 h Skin irritation: Classification: Irritating to skin. Result: Mild skin irritation Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product. Eye irritation: Classification: Irritating to eyes. Result: Mild eye irritation
Nonane	111-84-2	Acute oral toxicity: LD50 mouse Dose: 218 mg/kg Acute inhalation toxicity: LC50 rat Exposure time: 4 h
1,2,4-Trimethylbenzene	95-63-6	Acute inhalation toxicity: LC50 rat Dose: 18 mg/l Exposure time: 4 h Skin irritation: Classification: Irritating to skin. Result: Skin irritation Eye irritation: Classification: Irritating to eyes. Result: Eye irritation
Sulfur	7704-34-9	Acute oral toxicity: LD50 rat Dose: 5,001 mg/kg Acute dermal toxicity: LD50 rabbit Dose: 2,001 mg/kg Acute inhalation toxicity: LC50 rat Dose: 9.24 mg/l Exposure time: 4 h Eye irritation: Classification: Irritating to eyes. Result: Mild eye irritation

SECTION 12. ECOLOGICAL INFORMATION

Biochemical Oxygen Demand (BOD) : No data available

Chemical Oxygen Demand (COD)	:	No data available
Adsorbed organic bound halogens (AOX)	:	Not included
Additional ecological information	:	Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

Component:

Naphthalene	91-20-3	Toxicity to algae: EC50 Species: Dose: 33 mg/l Exposure time: 24 h
1,2,4-Trimethylbenzene	95-63-6	Toxicity to fish: LC50 Species: Pimephales promelas (fathead minnow) Dose: 7.72 mg/l Exposure time: 96 h Acute and prolonged toxicity for aquatic invertebrates: EC50 Species: Daphnia Dose: 3.6 mg/l Exposure time: 48 h
Sulfur	7704-34-9	Acute and prolonged toxicity for aquatic invertebrates: EC0 Species: Daphnia magna (Water flea) Dose: > 10,000 mg/l Exposure time: 24 h

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal : Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

SECTION 14. TRANSPORT INFORMATION

CFR

Proper shipping name	: DIESEL FUEL
UN-No.	: 1202 (NA 1993)
Class	: 3
Packing group	: III

TDG

Proper shipping name	: DIESEL FUEL
UN-No.	: UN1202 (NA 1993)
Class	: 3
Packing group	: III

IATA Cargo Transport

UN UN-No.	: UN1202 (NA 1993)
Description of the goods	: DIESEL FUEL
Class	: 3
Packaging group	: III

ICAO-Labels	: 3
Packing instruction (cargo aircraft)	: 366
Packing instruction (cargo aircraft)	: Y344

IATA Passenger Transport

UN UN-No.	: UN1202 (NA 1993)
Description of the goods	: DIESEL FUEL
Class	: 3
Packaging group	: III
ICAO-Labels	: 3
Packing instruction (passenger aircraft)	: 355
Packing instruction (passenger aircraft)	: Y344

IMDG-Code

UN-No.	: UN 1202 (NA 1993)
Description of the goods	: DIESEL FUEL
Class	: 3
Packaging group	: III
IMDG-Labels	: 3
EmS Number	: F-E S-E
Marine pollutant	: No

SECTION 15. REGULATORY INFORMATION

OSHA Hazards : Combustible Liquid
Toxic by ingestion
Severe skin irritant
Moderate eye irritant
Possible Cancer Hazard

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIROMENT)
The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil. Fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply**.**

TSCA Status : On TSCA Inventory

DSL Status : All components of this product are on the Canadian DSL list.

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

Components	CAS-No.

Naphthalene	91-20-3
Xylene	1330-20-7
1,2,4-trimethylbenzene	95-63-6

PENN RTK US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

Components	CAS-No.
Sulfur	7704-34-9
1,2,4-trimethylbenzene	95-63-6
Nonane	111-84-2
Xylene	1330-20-7
Naphthalene	91-20-3
Fuels, diesel, No 2; Gasoil - unspecified	68476-34-6

MASS RTK US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

Components	CAS-No.
Sulfur	7704-34-9
1,2,4-Trimethylbenzene	95-63-6
Nonane	111-84-2
Xylene	1330-20-7
Naphthalene	91-20-3

NJ RTK US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

Components	CAS-No.
Sulfur	7704-34-9
1,2,4-Trimethylbenzene	95-63-6
Nonane	111-84-2
Xylene	1330-20-7
Naphthalene	91-20-3
Fuels, diesel, No 2; Gasoil - unspecified	68476-34-6

California Prop. 65 : WARNING! This product contains a chemical known to the State of California to cause cancer.

Naphthalene 91-20-3

SECTION 16. OTHER INFORMATION

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing,

storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Template : GWU mbH
Prepared by Birlenbacher Str. 18
D-57078 Siegen

Germany

Telephone: +49-(0)271-88072-0

Revision Date : 01/27/2011

28, 34, 35, 37, 75, 90, 97, 108, 109, 1046, 1053, 1076, 1536, 1747, 1749, 1751, 1754, 1757, 1760, 1936

This Page Intentionally Left Blank.

Terra Industries Inc.
Terra Centre – 600 Fourth Street
Sioux City, Iowa 51101

Material Safety Data Sheet (MSDS)

Dinitrogen Tetroxide, Mixed Oxides of Nitrogen

MSDS Number 2001 (Revised January 25, 2011) 10 Pages

CAUTION

INHALATION HAZARD – OXIDIZER – CORROSIVE

CAUTION: Explosions may occur on contact with ammonia, boron trichloride, carbon disulfide, cyclohexane, fluorine, formaldehyde, hydrazine, nitrobenzene, toluene, incompletely halogenated hydrocarbons, propylene, alcohols, and ozone.

1. CHEMICAL PRODUCT and EMERGENCY TELEPHONE CONTACT

Product Name:	Dinitrogen Tetroxide
Chemical Family:	Inorganic Oxidizers
Synonyms:	Nitrogen Oxide, Nitrogen Dioxide, Nitrogen Peroxide, Nitrogen Tetroxide, Dinitrogen Tetroxide, Tetra Oxide, NTO
Formula:	N_2O_4
Product Use:	Fuel Oxidizer-Propellant

EMERGENCY TELEPHONE NUMBER

CHEMTREC (U.S.):	800-424-9300
CANUTEC (Canada):	613-996-6666
HEALTH EMERGENCIES	contact Poison Control Center

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient Name/CAS Number	Concentration, N2O4/NO	Exposure Limits
Dinitrogen Tetroxide/ 10544-72-6	99.5/<0.5	1 ppm STEL* C* 5 ppm PEL* 20 ppm IDLH*
Nitrogen Oxides (NO, NO2, N2O3) See Table Page 10102-44-0		

Nitric Oxide (NO) See Table Page 7
10102-43-9

Note: Exposure limits listed are for nitrogen dioxide, the most hazardous constituent of N2O4. Exposure limits applicable to mixed oxides of nitrogen.

* STEL = Short Term Exposure Limit, C = Ceiling, PEL = Permissible Exposure Limit, IDLH = Immediate Danger to Life and Health

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Dinitrogen Tetroxide is an acute inhalation hazard, strong oxidizer, and highly corrosive. Avoid exposure of skin and eyes to liquid or high vapor concentrations. Where liquid is present and the concentration of vapors in the breathing zone approaches or exceeds the PEL, respiratory protection is required.

NFPA Hazard Classification	Health Hazard (Blue) ……..	4
	Flammability (Red) …….	0
	Reactivity (Yellow) …….	0
	Special (White)…….OXIDIZER (OX)	

POTENTIAL HEALTH EFFECTS

Primary Routes of Entry: Inhalation, skin contact/absorption and eye contact.

General Acute Exposure: The vapor is highly irritating to the upper respiratory tract and lungs and harmful if inhaled. If available, administer medical oxygen by trained personnel. If breathing is shallow or has stopped, ensure clear airway and apply resuscitation. The material presents a hazard from a single acute exposure. **A single acute exposure may cause death.**

Inhalation:

Acute Exposure: Principal routes of exposure are generally by inhalation of fumes or physical contact. Serious results may not be felt until hours or days after exposure, even though heavy damage has occurred. Repeated inhalation may result in bronchitis or emphysema.

Skin:

Acute Contact: The liquid is highly corrosive to the skin and may cause chemical burns. If this product comes in contact with the skin: Immediately flush body and clothes with large amounts of water, using safety shower if available. Quickly remove all contaminated clothing, including footwear. Wash affected areas with water (and soap if available) for at least 15 minutes.

Eye:
Acute Contact: The vapor is extremely irritating to the eyes and is capable of causing pain and severe conjunctivitis. If this product comes in contact with the eyes: Immediately hold the eyes open and wash continuously for at least 15 minutes with fresh running water. Ensure irrigation under eyelids by occasionally lifting the upper and lower lids.

Neurologic:
Acute Exposure: An altered mental status (coma) may be seen, but is not characteristic unless hypoxemia occurs.

Ingestion:
If this chemical has been swallowed, seek immediate medical attention.

Note to the Physician: Pneumonitis should be anticipated after inhalation or ingestion. If severe exposure is suspected, observe for 48-72 hours for delayed pulmonary edema.

Medical Conditions Aggravated by Exposure: Chronic respiratory or skin disease.

.

4. FIRST AID MEASURES

First Aid for Eyes: Immediately flush eyes with copious amounts of tepid water for at least 15 minutes. If irritation, pain, swelling, excessive tearing, or light sensitivity persists, the patient should be seen in a health care facility and referral to an ophthalmologist considered.

First Aid for Skin: Immediately flush exposed area with copious amounts of tepid water for at least 15 minutes followed by washing area thoroughly with soap and water. The patient should be seen in a health care facility if irritation or pain persists.

First Aid for Inhalation: Move patient to fresh air. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. If trained to do so administer supplemental oxygen with assisted ventilation as required. Administer artificial respiration if patient is not breathing.

First Aid for Ingestion: If this chemical has been swallowed, seek immediate medical attention.

5. FIRE FIGHTING MEASURES

Flash Point:	Not Applicable
Lower Flammable Limit:	Not Applicable
Upper Flammable Limit:.....	Not Applicable
Auto ignition Temperature.....	Not Applicable

Noncombustible Liquid/Gas, but will accelerate the burning of combustible materials.

Extinguishing Media: Chose appropriate media for surrounding fire. Water contact with liquid will create large amounts of toxic vapors. Caution: do not add water to an enclosed vessel. Water addition in a contained vessel may rapidly increase pressure due to vapor generation. Water spray or water fog will knock down vapors and is effective.

Special Fire Fighting Procedures:

a. Do not get water inside container.
b. Stop flow of gas if you can do without risk.
c. Move container from fire area if you can do it without risk.
d. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks due to exploding potential when tanks are involved in a fire.
e. Isolate area until gas has dispersed.
f. Use water spray or foam to control vapors.
g. Positive pressure self-contained breathing apparatus (SCBA) should be used when there is a potential for inhalation of vapors and/or fumes.
h. Chemical protective clothing that is safe for use with nitric acid involved in a fire should be worn.
i. Runoff from fire control or dilution water may cause pollution.

Fire/Explosion Hazard:

Non-flammable but strong oxidizer and will increase the intensity of a fire and support combustion. Heating may cause expansion or decomposition leading to violent rupture of containers. Contact with readily oxidizable organic material may cause ignition /fire. Decomposes on heating and produces toxic fumes of nitrogen oxides (NOx) and nitric acid. In presence of moisture, the material is corrosive to aluminum, zinc and tin producing highly flammable hydrogen gas. Reacts vigorously with alkalis. Reacts violently with incompatible materials.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Measures:

Clear area of personnel and move upwind. Alert Fire Brigade and tell them location and nature of hazard. Wear full body protective clothing with breathing apparatus. Prevent, by any means available, spillage from entering drains or watercourses. Consider evacuation. Shut off all possible sources of ignition and increase ventilation. No smoking or naked lights within area. Stop leak if safe to do so. Do not exert excessive pressure on valve; do not attempt to operate damaged valve. Water spray or fog may be used to mitigate the inhalation hazard. Absorb or cover spill with sand, earth, inert material or vermiculite. Carefully, contain and neutralize with slaked lime. Collect residues and seal in labeled drums for disposal. After clean up operations, decontaminate protective gear and equipment by soaking in 5% soda ash solution for at least 24 hours. Rinse and dry.

Disposal:
Dispose of neutralized waste solutions and any residues in compliance with local, state, and Federal laws. Place leaking cylinder in a fume hood or safe outdoor area. When slow release of gas to air is unacceptable, attach needle valve and tube to run gas into an excess of 5 to 10% aqueous sodium hydroxide solution (with caution). Cover liquid spill with soda ash or slaked lime. Water spray or fog may be used to disperse vapors. All waste solutions are to be neutralized before disposal.

Determining Spill Size:

Generally, a small spill is one that involves a single, small container (Less than 1-gallon capacity), or a small (non-continuing) leak from a larger tank or vessel
Note: EPA Reportable Quantity (RQ) is 10 pounds.

Small Spill:

First isolate 100 feet in all directions, then protect persons downwind 0.1 mile (day) or 0.3 mile (night).

Large Spill:

First isolate 500 feet in all directions, then protect persons downwind 1.0 mile (day) or 2.5 miles (night).

7. HANDLING AND STORAGE

Caution: Dinitrogen Tetroxide is an acute inhalation hazard, strong oxidizer and highly corrosive. Avoid exposure of skin and eyes to liquid or vapors.
Note: When liquid is present and the concentration of the vapor in the breathing zone approaches or exceeds 1 ppm, SCBA respiratory protection is required.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION / OSHA ASSIGNED PROTECTION FACTORS (APF)

Respiratory Protection Requirements:

<1 ppm:	No protection required.
1ppm:	Protection required if exposed for more than 15 minutes.
>1 to 20 ppm:	(APF=25) Any supplied-air respirator operated in a continuous flow mode. (APF=50) Any self-contained breathing apparatus with a full facepiece (APF=50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF=10,000) Any SCBA that has a full face piece and is operated in a pressure-demand or other positive-pressure mode

(APF=10,000) Any supplied-air respirator that has a full face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF=50) Any appropriate escape-type, self-contained breathing apparatus.

Skin Protection Requirements: Acid resistant gloves, acid resistant safety boots, acid resistant suit, impervious protective clothing with full-length sleeves and pants.

Eye Protection Requirements:

Lab / Fume Hood: Use chemical (indirectly vented) goggles when there is a potential for contact with liquid or mist. A full-face shield is recommended in addition to goggles for added protection.

Field: Indirectly vented chemical goggles, or in lieu of goggles, eye protection provided by full face respirator is acceptable.

Note: Contact lenses pose a special hazard: soft lenses absorb irritants and all lenses concentrate them.

Other Protective Equipment: Safety shower and eyewash fountains should be available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Liquid
Color:	Non-flammable, yellowish to reddish-brown gas. Reddish-brown to green liquid. Forms a colorless solid. (See Table Below)
Odor:	Pungent acidic odor first perceptible at 1 to 3 ppm
Boiling Point:	See Table
Melting point:	See Table
Specific Gravity:	See Table
Vapor Density:	1.58
Vapor Pressure:	See Table
% Volatile by Volume:	100
Molecular Weight:	92.01
Density:	1.38 to 1.43 g/ml
Material Decomposes	>320º F (160ºC)
Critical Pressure:	10.1 MPa

GRADE	NTO	MON-1	MON-3	MON-10	MON-15	MON-25
Molecular Weight (N_2O_4)	92.01	92.01	92.01	92.01	92.01	92.01
Relative Vapor Density	1.58	1.58	1.58	1.58	1.58	1.58
Color	Brown	Green	Green	Green	Green	Green
NO, %	0	1	3	10	15	25
N_2O_4 + NO, %	99.5	99.5	99.5	99.5	99.5	99.5
Boiling, F	70	68	65	49	39	16
Freezing, F	12	9	5	-10	-24	-69
Vapor @77F, psia	17.5	18.5	20.5	30.0	40.5	76.0
Sp. Gravity @ 77F	1.431	1.429	1.423	1.407	1.397	1.380

10. REACTIVITY

Stability: ..... This is a stable material.
Hazardous Polymerization: ..... NA

Decomposition: Decomposes above 320°F to form nitric oxide and oxygen

Incompatibilities:

a. Incompatible with water, bases, flammable and combustible materials, copper, aluminum.

b. Forms nitric acid and nitrogen oxide vapors when exposed to moisture. Nitric acid is very corrosive to non-stainless steel metals.

c. Explosions may occur on contact with ammonia, boron trichloride, carbon disulfide, cyclohexane, fluorine, formaldehyde, hydrazine, nitrobenzene, toluene, incompletely halogenated hydrocarbons, propylene, alcohols, and ozone.

11. TOXICOLOGICAL INFORMATION

Toxicity: Highly Toxic

Acute Inhalation Toxicity
LC_{50} Rat: ..... 138 ppm (0.5hr)

Corrosiveness / Irritation
Skin Irritation / Corrosion: ..... Severe corrosive to skin
Eye Irritation / Corrosion: ..... Severe corrosive to eyes and mucous membranes

Genetic Toxicity
Mutagenic effects:……..No known significant effects or critical hazards
Reproduction Toxicity……No known significant effects or critical hazards

Carcinogen Status……ACGIH: A4 Not classified as a human carcinogen

Genetic Toxicity *in vivo*
Drosophila melanogaster:……..No evidence for mutagenicity
Carcinogenicity
All:……..No carcinogenic effects
Toxicity to Reproduction
Pig:……..Temporarily depressed mean daily gain (MDG) at 35 mg/kg in gilts (One generation study)
Human Experience
Inhalation:……It has been reported that 10-20 ppm has been mildly irritating [Patty 1963]. Exposure to 150 ppm or more (no time period given) has been reported to cause death from pulmonary edema [NRC 1979]. It has been predicted that 50% lethality would occur following exposure to 174 ppm for 1 hour.

Ecotoxicity:

LCL Goldfish:……....750 ppm 5 hours*
LCL Fathead Minnow:……...1000 ppm for 7 hours*

*Information derived from Nitric Acid ecotoxicity data

12. ECOLOGICAL INFORMATION*

Note: Dinitrogen Tetroxide will significantly lower the pH of any water source it comes in contact with (form nitric acid)

a. Nitric acid is harmful to aquatic life in very low concentrations
b. May be dangerous if it enters water intakes. Notify operator of nearby water intakes.
c. Notify local health and wildlife officials

*Information derived from Nitric Acid ecological impact data

13. DISPOSAL CONSIDERATIONS

Dispose of neutralized waste solutions and any residues in compliance with local, state, and Federal laws. EPA RQ is 10 pounds. Place leaking cylinder in a fume hood or safe outdoor area. When slow release of gas to air is unacceptable, attach needle valve and tube to run gas into an excess of 5 to 10% aqueous sodium hydroxide solution (with caution). Cover liquid spill with soda ash or slaked lime. Water spray or fog may be used to disperse vapors. All waste solutions are to be neutralized before disposal.

14. TRANSPORTATION INFORMATION

U.S. DOT and Canadian TGD Act

Shipping Name:..... Dinitrogen Tetroxide
Hazard Class/Division:..... 2.3
Product Identification Number (PIN): ..... UN 1067
DOT Placard: ..... Poison Gas-2.3, Oxidizer-5.1, Corrosive-8
Note:…….. *Product may be shipped under different placarding/labeling for shippers holding a DOT special permit*
DOT Special Provision (49CFR172.102): .... "Inhalation Hazard", 1, B7, B14, B45, B46, B61, B66, B67, B77, T50, TP21
OSHA Label Required:..... Yes
Transportation by Air…….Forbidden
EPA RQ (Reportable Quantity): ..... 10 pounds
STCC Number: 4920174

15. REGULATORY INFORMATION

Controlled Products Regulations Classification: A: Compressed Gas; E: Corrosive
OSHA: This product is considered a hazardous material under criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200 (Toxic; Corrosive), and is listed as a Highly Hazardous Chemical subject to the requirements of the Process Safety Management Standard 29 CFR 1910.119 (Threshold Quantity 250lbs).

CAA Chemical Accident Prevention: Not a regulated chemical

SARA TITLE III:

a. EHS (Extremely Hazardous Substances) List: Listed (EPA, 1992a)
b. SARA RQ (Reportable Quantity): 10 pounds
c. TPQ (Threshold Planning Quantity): 100 pounds
d. Regulation: "Emergency Planning and Notification" – 40 CFR Part 355
e. Section 313: Dinitrogen Tetroxide does not require reporting under Section 313

CERCLA Hazardous Substances List:

a. CERCLA RQ (Reportable Quantity): 10 pounds
b. Regulation: "Designation, Reportable Quantities, Notification" - 40 CFR 302

TSCA Inventory: Dinitrogen Tetroxide is listed on the TSCA inventory

Chemical Facility Anti-Terrorism Standard (CFATS) / 6 CFR Part 27:
Dinitrogen Tetroxide is listed in Appendix A as a Chemical of Interest (COI) due to threat of theft for use as a component in a WME.
Screening Threshold Quantity (STQ): 15 pounds

CAGE Code # - 1YUW6
Contract # -SP0600-07-D-1564

Equipment, Pressure Vessels, Testing, Etc.: All equipment used to handle, store, transfer, etc., dinitrogen tetroxide must be properly engineered, constructed and maintained in compliance with all applicable regulations and standards. Pressure vessels, piping and appurtenances should be regularly inspected and tested using methods designed to reveal external and internal deterioration or defects that may impair the integrity of the equipment such that an unintended release of dinitrogen tetroxide may result. Consult with experts, as applicable, concerning the methods that would be most appropriate given the particular circumstances.

16. OTHER INFORMATION

- 3-26-08: The MSDS was rewritten to comply with ANSI Standard Z400.1-1993, and to transfer information into the Terra format.
- 1-19-09: Updated MSDS to reflect components of N2O4 (i.e. mixed oxides of nitrogen), updated CAS numbers, updated transportation information, updated NFPA hazard classification, and various language changes for clarity.
- 1-25-11: Reviewed. Revised to include shipping information (Cage code and contract #).

========== Product Identification ==========

Product ID:OTTO FUEL II
MSDS Date:12/20/1995
FSC:1356
NIIN:00-842-0630
MSDS Number: CFSYC
=== Responsible Party ===
Company Name:NAVAL SURFACE WARFARE CENTER
Address:101 STRAUSS AVE
City:INDIAN HEAD
State:MD
ZIP:20640-5035
Country:US
Info Phone Num:301-743-4659
Emergency Phone Num:301-743-4438
CAGE:JO160
=== Contractor Identification ===
Company Name:NAVAL SURFACE WARFARE CENTER
Address:CODE 7600, BUILDING 1959
Box:10
City:YORKTOWN
State:VA
ZIP:23691-5076
Country:US
Phone:804-887-4930
CAGE:JO160
Company Name:NAVAL SURFACE WARFARE CTR
Address:101 STRAUSS AVE
Box:City:INDIAN HEAD
State:MD
ZIP:20640-5035
Country:US
Phone:301-743-4924
CAGE:14083

========== Composition/Information on Ingredients ==========

Ingred Name:1,2-PROPANEDIOL, DINITRATE; (PROPYLENE GLYCOL DINITRATE
(PGDN))
CAS:6423-43-4
RTECS #:TY6300000
Fraction by Wt: 76%
OSHA PEL:0.05 PPM
ACGIH TLV:0.05 PPM, S

Ingred Name:2-NITRODIPHENYLAMINE (2-NDPA)
Fraction by Wt: 1.5%
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:SEBACIC ACID, DIBUTYL ESTER; (DI-N-BUTYL SEBACATE (DBS))
CAS:109-43-3
RTECS #:VS1150000
Fraction by Wt: 22.5%
OSHA PEL:N/K
ACGIH TLV:N/K

Ingred Name:EFTS OF OVEREXP:STIMULI, LOW BLOOD PRESS, DIZZ, ABDOM
CRAMPS & VOMIT. CHRONIC:ALTHOUGH EPIDEMIOLOGIC EVID IS LTD,(ING 5)
RTECS #:9999999ZZ

Ingred Name:ING 4:CHRONIC OVEREXP MAY BE ASSOC W/INCR RISK OF CVS

DISEASE, INCL HEART ATTACKS & HEART PAIN. TARGET EFTS OF (ING 6)
RTECS #:9999999ZZ

Ingred Name:ING 5:EXPOSURE TO OTTO FUEL II INCLUDE CENTRAL NERVOUS SYSTEM DEPRESSION, VASODILATION & METHEMOGLOBIN FORMER.
RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC:DO NOT INDUCE VOMIT. QUALIFIED MED PERS SHOULD CONSIDER USE OF ACTIVATED CHARCOAL/GASTRIC LAVAGE. (ING 8)
RTECS #:9999999ZZ

Ingred Name:ING 7:SEEK PROMPT MEDICAL ATTENTION. EMERGENCY MEDICAL TREATMENT PROCEDURES:TREAT SYMPTOMATICALLY & SUPPORTIVELY.
RTECS #:9999999ZZ

Ingred Name:SPILL PROC:SPILL. CONTAINERIZE ALL CONTAM MATL FOR PROPER DISP. MINOR SPILL:CONFINE SPILL. USE CLEAN SAWDUST, (ING 10)
RTECS #:9999999ZZ

Ingred Name:ING 9:RAGS/OTHER ABSORB MATL TO ABSORB BULK OF SPILLED FUEL. WIPE CONTAM AREA W/CLOTH OR SPONGE DAMPENED W/ETHYL(ING 11)
RTECS #:9999999ZZ

Ingred Name:ING 10:OR ISOPROPYL ALCOHOL OR ACETONE. CLEAN AREA W/SOAP & WATER. CERCLA:REPORT SPILLS PER 40 CFR 302.6.
RTECS #:9999999ZZ

========== Hazards Identification ==========

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:NO
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:ACUTE:INHAL:HDCH, NASAL CONGESTION, NAUS, DIZZ, DILATION OF BLOOD VESSELS, HYPOTENSION, DFCLTY W/BALANCE, POSS HYPOTENSION, NARROWED PULSE PRESS & OTHER SYMPS OF NARCOS. EYE CONT:LOC IRRIT, DECR VISUA L ACUITY & MAY BE ABSORBED TO CAUSE SYSTEMIC EFTS OF HDCH, NAUS, DIZZ, VOMIT & OTHER SYMPS NOTED UNDER (EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ:INHAL. SKIN CONT:LOC IRRIT & MAY BE ABSORBED TO CAUSE SYSTEMIC EFTS OF HDCH, NAUS, DIZZ & OTHER SYMPS NOTED UNDER INHAL. A YELLOWISH DISCOLORATION IN EXPOS AREAS IS INDICATIVE OF POOR WORK PR ACTICES & SUGGESTS SIGNIFICANT DERMAL CONT MAY HAVE OCCURRED. INGEST:LETHARGY, REDUCED RESPONSE TO EXTERNAL (ING 4)
Medical Cond Aggravated by Exposure:PERS W/INCR RISK TO EXPOS ARE:PERS W/HYPOTENSION, ANEMIA, HYPERTHYROIDISM & CVS DISEASE. PERS W/UNDERLYING HEART DISEASE MAY DEVELOP CHEST PAIN/SUFFER HEART ATTACKS WHEN REMOVED FROM CHRONIC EXPOSURE.

========== First Aid Measures ==========

First Aid:INHAL:REMOVE TO FRESH AIR IMMED. IF BRTHG HAS STOPPED, GIVE ARTF RESP. SEEK PROMPT MED ATTN. EYES:WASH IMMED W/LG AMTS OF WATER/SALINE SOLN, OCCAS LIFTING UPPER & LOWER LIDS, FOR AT LST 15 MINS. SEEK PROMPT MED ATTN. SKIN:REMOVE CONTAM CLTHG IMMED. WASH AFFECTED AREAS W/SOAP & WATER FOR AT LST 15 MINS. SEEK PROMPT MED ATTN IF IRRIT PERSISTS. DO NOT USE SOLVS TO REMOVE OTTO FUEL II. INGEST: (ING 7)

========== Fire Fighting Measures ==========

Flash Point Method:COC
Flash Point:265F,129C
Extinguishing Media:FLOOD W/WATER; IF NO WATER IS AVAILABLE, USE DRY

CHEMICAL OR DIRT.
Fire Fighting Procedures:USE NIOSH APPRVD SCBA & FULL PROT EQUIP . DO NOT MOVE CNTNRS IF EXPOS TO HEAT HAS OCCURRED. DO NOT FIGHT FIRE WHEN IT REACHES STOR AREA. AVOID (SUPP DATA)
Unusual Fire/Explosion Hazard:FIRE & EXPLOSION HAZARD. LOW FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

========== Accidental Release Measures ==========

Spill Release Procedures:MAJOR SPILL:SHUT OFF IGNIT SOURCES. NO SMOKING, FLAMES/FLARES IN HAZ AREA. EVACUATE AREA FOR 250 FT IN ALL DIRECTIONS. KEEP UNNEC PEOPLE AWAY. REQ USE OF NIOSH APPRVD RESP PROT & IMPERVIOUS CLTHG. CON FINE SPILL. USE SAME METH AS FOR MINOR (ING 9)
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

========== Handling and Storage ==========

Handling and Storage Precautions:AVOID CONTACT W/HEAT, SPARKS, FLAMES OR OTHER SOURCES OF IGNITION. STORE AWAY FROM INCOMPATIBLE MATERIALS.
Other Precautions:OBSERVE ALL FEDERAL, STATE & LOCAL REGULATIONS WHEN STORING THIS MATERIAL.

========== Exposure Controls/Personal Protection ==========

Respiratory Protection:NIOSH APPROVED FULL-FACE PRESSURE DEMAND SCBA IS REQUIRED IF AIRBORNE CONCENTRATION LEVELS EXCEED LIMITS ESTABLISHED BY THE NAVY.
Ventilation:LOCAL EXHAUST VENT SYSTEM TO MEET EXPOSURE LIMITS. CONTACT LOCAL INDUSTRIAL HYGIENIST FOR GUIDANCE.
Protective Gloves:NITRILE BUNA-RUBBER GLOVES
Eye Protection:ANSI APPRVD CHEM WORKERS GOGGS &(SUPDAT)
Other Protective Equipment:ANSI APPRVD EYE WASH FOUNTAIN & DELUGE SHOWER . IMPERVIOUS APRON MAY BE REQD FOR SOME OPERATIONS. WEAR (SUPP DATA)
Work Hygienic Practices:THERE SHOULD BE NO SMOKING OR EATING IN WORKPLACE. THOROUGHLY CLEAN/LAUNDER CLOTHING SEPARATELY PRIOR TO REUSE.
Supplemental Safety and Health
FIRE FIGHT PROC:BRTHG DUSTS & FUMES. HAZ DECOMP PROD:DEPEND UPON CIRCUMSTANCES & CNDTNS OF COMBUST. EYE PROT:FULL LGTH FSHLD . OTHER PROT EQUIP:FLAME-RESISTANT COVERALLS, CONDUCTIVE-SOLED SHOES & FLAME-RESISTANT CAP FOR PROD MFG OPERATIONS. DURING HNLDG OPERATIONS, WEAR CLTHG WHICH IS IMPERVIOUS TO PROD.

========== Physical/Chemical Properties ==========

Boiling Pt:B.P. Text:>250F,>121C
Melt/Freeze Pt:M.P/F.P Text:-18F,-28C
Vapor Pres:0.0877@77F
Vapor Density:1.232
Spec Gravity:1.232 (H*2O=1)
Solubility in Water:INSOLUBLE
Appearance and Odor:REDDISH-ORANGE LIQUID W/DISAGREEABLE ODOR.

========== Stability and Reactivity Data ==========

Stability Indicator/Materials to Avoid:YES
ACIDS, OXIDIZERS & COMBUSTIBLES.
Stability Condition to Avoid:AVOID HEAT, SPARKS, OPEN FLAME & OTHER SOURCES OF IGNITION.
Hazardous Decomposition Products:DECOMP PRODS INCL CARBON MONOXIDE, HYDROGEN CYANIDE, OXIDES OF NITROGEN & POSSIBLY OTHER MATLS. CONCS GENERATED (SUPDAT)

========== Disposal Considerations ==========

Waste Disposal Methods:DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS . CONTAINERIZED SPILLED MATERIAL MUST BE DISPOSED OF AS A HAZARDOUS WASTE PER 40 CFR 262. RCRA:OTTO FUEL II IS A REACTIVE HAZARDOUS WAST E & HAS AN EPA WASTE NUMBER OF D003.

Material Safety Data Sheet

Unsym-Dimethylhydrazine, 99%

ACC# 04536

Section 1 - Chemical Product and Company Identification

MSDS Name: Unsym-Dimethylhydrazine, 99%
Catalog Numbers: AC116320000, AC116320100, AC116321000, AC116322500, AC116325000
Synonyms: 1,1-Dimethylhydrazine; UDMH
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
57-14-7	Unsym-Dimethylhydrazine	99	200-316-0

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear light yellow liquid. Flash Point: -17 deg C.

Danger! Highly flammable. Corrosive. Causes eye and skin burns. Harmful if inhaled or swallowed. May be harmful if absorbed through the skin. May cause severe digestive tract irritation with possible burns. Cancer suspect agent. May cause severe respiratory tract irritation with possible burns. May cause central nervous system depression.

Target Organs: Central nervous system, liver.

Potential Health Effects

Eye: Causes eye burns. May result in corneal injury.
Skin: Causes skin burns. May be harmful if absorbed through the skin.
Ingestion: Harmful if swallowed. May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause liver damage.
Inhalation: Harmful if inhaled. Causes chemical burns to the respiratory tract. Exposure produces central nervous system depression. Vapors may cause dizziness or suffocation.
Chronic: Possible cancer hazard based on tests with laboratory animals. Chronic exposure may cause liver damage.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub eyes or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).
Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable liquid and vapor. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Will be easily ignited by heat, sparks or flame.
Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.
Flash Point: -17 deg C (1.40 deg F)
Autoignition Temperature: 249 deg C (480.20 deg F)

Explosion Limits, Lower:2.9
Upper: 95
NFPA Rating: (estimated) Health: 4; Flammability: 3; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Do not get on skin or in eyes. Avoid ingestion and inhalation. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Refrigerator/flammables.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Unsym-Dimethylhydrazine	0.01 ppm TWA; Skin - potential significant contribution to overall exposure by the cutaneous r oute	15 ppm IDLH	0.5 ppm TWA; 1 mg/m3 TWA

OSHA Vacated PELs: Unsym-Dimethylhydrazine: 0.5 ppm TWA; 1 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear light yellow
Odor: fishy ammoniacal
pH: Strongly alkaline
Vapor Pressure: 145 mbar @ 20 C
Vapor Density: 1.94
Evaporation Rate: Not available.
Viscosity: 0.56 cP 20.00 deg
Boiling Point: 62.0 - 64.0 deg C @ 753.00mmH
Freezing/Melting Point:-58 deg C
Decomposition Temperature: Not available.
Solubility: miscible
Specific Gravity/Density:.7800g/cm3
Molecular Formula:C2H8N2
Molecular Weight:60.10

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, ignition sources, dust generation, excess heat.
Incompatibilities with Other Materials: Halogens, mercury, strong acids, strong oxidizing agents, rubber, plastics.

Hazardous Decomposition Products: Nitrogen oxides, carbon monoxide, carbon monoxide, carbon dioxide, nitrogen gas.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 57-14-7: MV2450000
LD50/LC50:
CAS# 57-14-7:
Dermal, guinea pig: LD50 = 1329 mg/kg;
Inhalation, mouse: LC50 = 172 ppm/4H;
Inhalation, rat: LC50 = 252 ppm/4H;
Oral, mouse: LD50 = 155 mg/kg;
Oral, rat: LD50 = 122 mg/kg;
Skin, rabbit: LD50 = 1060 mg/kg;
Skin, rat: LD50 = 770 mg/kg;
.

Carcinogenicity:
CAS# 57-14-7:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
- **California:** carcinogen, initial date 10/1/89
- **NTP:** Suspect carcinogen
- **IARC:** Group 2B carcinogen

Epidemiology: Has been found to cause cancer in laboratory animals.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: No data available. No information available.
Environmental: Terrestrial: Not expected to adsorb to sediments. Aquatic: Will not settle in sediment, volatilizes into atmoshere. Atmospheric: Exists mainly in vapor phase, half-life 6 days. Not expected to bioconcentrate or biodegrade.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 57-14-7: waste number U098.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	DIMETHYLHYDRAZINE, UNSYMMETRICAL	DIMETHYLHYDRAZINE, UNSYMETRICAL
Hazard Class:	6.1	6.1(3)(8)
UN Number:	UN1163	UN1163
Packing Group:	I	I

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 57-14-7 is listed on the TSCA inventory.
Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 57-14-7: 10 lb final RQ; 4.54 kg final RQ

SARA Section 302 Extremely Hazardous Substances

CAS# 57-14-7: 1000 lb TPQ

SARA Codes

CAS # 57-14-7: immediate, delayed, fire, reactive.

Section 313

This material contains Unsym-Dimethylhydrazine (CAS# 57-14-7, 99%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

CAS# 57-14-7 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

CAS# 57-14-7 is considered highly hazardous by OSHA.

STATE

CAS# 57-14-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Unsym-Dimethylhydrazine, a chemical known to the state of California to cause cancer.
California No Significant Risk Level: None of the chemicals in this product are listed.

European / International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T F

Risk Phrases:

R 11 Highly flammable.
R 23/25 Toxic by inhalation and if swallowed.
R 34 Causes burns.
R 45 May cause cancer.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.

WGK (Water Danger/Protection)

CAS# 57-14-7: No information available.

Canada - DSL/NDSL

CAS# 57-14-7 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D1A, D2A, E.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 57-14-7 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 6/12/1998
Revision #5 Date: 11/20/2008

APPENDIX J
ENVIRONMENTAL PROTECTION

J.1 INTRODUCTION

This appendix provides the responder with background information on the physical environment, cultural resources, and protected species and habitats found at the Pacific Missile Range Facility (PMRF). Cultural resources, protected species and habitats, must be identified in advance so responders can effectively implement appropriate protection measures in the case of a major Oil or Hazardous Substance (OHS) release.

Information provided in this appendix comes from the *Integrated Cultural Resources Management Plan for the Pacific Missile Range Facility*, dated September 2012, and the *Integrated Natural Resources Management Plan for the Pacific Missile Range Facility*, dated November 2010. For more detailed information on the topics covered in this appendix please refer to these plans.

J.2 PHYSICAL ENVIRONMENT

J.2.1 Location

The main base or principal operations area for PMRF is located at Barking Sands on the west shore of Kauai. Barking Sands is a long, narrow site bordered by agricultural land, coastal undeveloped land, and parkland. The area consists of approximately 2,060 acres extending from Kokole Point in the south to Polihale State Park in the north. At its northern and southern boundaries, Barking Sands is just over 0.6 miles wide. The installation narrows to 0.3 miles in its central and narrowest portion. Barking Sands beach is named Ke-one-kani-o-Nohili, which means “the sounding sand of Nohili” in the Hawaiian language. This refers to the loud sounds made when the sands are walked upon.

J.2.2 Geography

Barking Sands is located on the west or leeward side of Kauai on a low-lying coastal terrace within the Mana Plain. The site is approximately 120 nautical miles (nm) northwest of Pearl Harbor, Oahu, and occupies a land area of approximately 2,060 acres, lying just south of Polihale State Park. The Mana Plain bounds the western flank of the island, forming gentle westerly slopes near the volcanic upland and relatively flat land at the coastal margin.

J.2.3 Topography

Barking Sands has a generally flat topography with a nominal elevation of fifteen feet above mean sea level. Low beach barrier dunes, mildly undulating blanket sands, and the more prominent Nohili Dunes located at the northern end of the base form local relief. The Nohili Dunes form the highest elevation point on the base, rising to approximately one hundred feet above mean sea level.

J.2.4 Geology

Barking Sands is located on a low-lying coastal terrace within the Mana Plain. The Mana Plain bounds the western flank of the island of Kauai, forming gentle westerly slopes near the volcanic upland and relatively flat land at the coastal margin. The Mana Plain is composed of alluvium, lagoon, beach, and dune deposits that overlie a typical volcanic basement.

The Napali Coast located north of the Barking Sands area is composed of tholeiitic lava flows of the Napali formation. The abrupt cliffs at the shore of the Napali coast has led geologists to speculate that this dramatic topography was caused by a giant landslide that cut deep into the island, removing and transporting a lot of it to the north or northwest, leaving the scarps/cliffs that we see today.

J.2.5 Soils

The coastline of Barking Sands is dominated by an expanse of beaches backed by large dunes to the north. Dunes consist of hills and ridges of sand formed by wind-driven and piled sand drifts in a continuing dynamic process. However, local strand vegetation helps to stabilize dune formation and accretion. The entire beach berm is approximately ten feet high and is breached only where drainage channels cut through at Nohili Ditch and Kawaiele Ditch.

Six soil types underlie Barking Sands: (1) Jaucus Loamy Fine Sand; (2) Beaches; (3) Dune Land; (4) Kaloko Clay; (5) Kaloko Clay Loam; and (6) Fill Land. The majority of the inland portion of Barking Sands is underlain by the Jaucus Loamy Fine Sand while Beaches comprises the majority of the coastal areas except at the northern end where Dune Land exist.

As the predominate soil type, the Jaucus series consists of excessively drained, calcareous soils that occur as narrow strips on coastal plains, and adjacent to the ocean. Permeability is rapid, runoff is slow, the water erosion hazard is slight, and the wind erosion hazard is severe where vegetation has been removed.

J.2.6 Hydrology

Surface water within Barking Sands is largely concentrated in the drainage ditches that drain the agricultural areas east of the facility. There are two man-made oxidation ponds located in the southern portion of Barking Sands. Surface water on the Mana Plain is restricted to drains and agricultural irrigation ponds. The surface water and storm water runoff drain onto former sugarcane lands and agricultural ponds below the Mana cliffs. The Mana Plain is drained by ditches/canals that flow seaward. Typically, the water from these ditches is brackish.

Barking Sands is located in the Kekaha Aquifer System of the Waimea Aquifer Sector which is bounded on the north by Polihale Ridge, on the east by the drainage divide of Waimea Canyon, and on the south and west by the ocean. Kekaha is the driest aquifer system in Kauai having an annual rainfall of thirty three inches. Surface drainage is by way of small, non-perennial streams that debouch onto the Mana Plain.

There are two aquifers underlying Barking Sands: (1) sedimentary and (2) dike-impounded. The sedimentary aquifer (aquifer code 20301116 [22311]) is basal, unconfined and has potential use. It is considered irreplaceable and ecologically important with moderate salinity and has a high vulnerability to contamination. The dike-impounded aquifer (aquifer code 20301122 [21223]) is basal, confined and has potential use for drinking water. It is mildly saline and is considered irreplaceable with a low vulnerability to contamination.

J.3 CULTURAL RESOURCES

Previous cultural resource studies have identified historic properties at Barking Sands, including Native Hawaiian sites, plantation-era sites, and World War II era military sites. Most of these sites are located within the coastal dunes, which is considered an area of high archaeological sensitivity both because of the known buried cultural deposits and Native Hawaiian human

remains, and because of the potential for encountering additional subsurface resources in the future.

Significant, traditional Hawaiian archaeological sites and/or cultural places at Barking Sands are listed below, along with their site number.

- Hawaiian habitation and major burial sites within Nohili Dunes (01-0007)
- Elekuna Heiau inland of Nohili Dune (01-0008)
- Habitation sites inland of Nohili Dunes (01-009)
- Habitation and burial site in dune (05-0826)
- Habitation at Nohili Ditch (05-1829 and 05-1830)
- Burial site eroding out of dune (05-1831, 05-1833)
- 10 acre burial site (015-1834)
- Nohili Dune (cultural place) (01-1860)
- Kauakii (Pohaku) (05-1861)
- Burial site in dune (05-1884)
- Habitation and burial site eroding from dune (05-1885)
- Habitation site between North Nohili Road and Barking Sands boundary (01-2017)
- Habitation sites (01-2019, 01-2021, 05-2031, 05-4016)
- Habitation and burial sites (05-2027, 05-2035)
- Habitation site at Nohili Dunes (01-6027)

Plantation-era sites include a Japanese cemetery (05-0616); Kawaiele Ditch which is significant in both traditional Hawaiian-era and Plantation-era (05-0721); burial sites (05-0825, 05-1832); and a dump site (05-2003). World War II-era sites include concrete pillboxes (05-2007, 05-2048); concrete boxes (01-2008, 05-2023); concrete piers and metal gun turret (01-2013); concrete structure and wooden structures (05-2028); revetments (05-2032, 05-2033, 05-2034, 05-2036, 05-2037, 05-2038, 05-2039, 05-2040); concrete structure (05-2047); and concrete tank (01-2050).

Architectural studies have also identified two World War II-era buildings (Radio Room and Command Post) and one Cold War-era building (Operations and Crash Station) at Barking Sands that are Management Category I sites under National Register of Historic Places (NRHP) criteria. There are two World War II-era buildings (Telephone Exchange and Command Post) and three structures from the Plantation-era (Kawaiele Ditch, Kini Ditch, and Nohili Ditch) that are Management Category II under NRHP criteria. In addition, there are four Cold War-era structures (missile assembly and storage, dehumidified aircraft storage container, and Hawaii Air National Guard war readiness material equipment storehouse) that are Management Category II under NRHP criteria.

J.4 ECOSYSTEMS

The Mana Plain, where PMRF's main base is located, is historically associated with extensive wetlands separated from the extensive coastal beach by high sand dunes. The four significant ecosystems in the immediate area of Barking Sands are (1) altered and natural wetlands, (2) coastal beach, (3) high dune, and (4) marine, nearshore (see Figures J-1 and J-2).

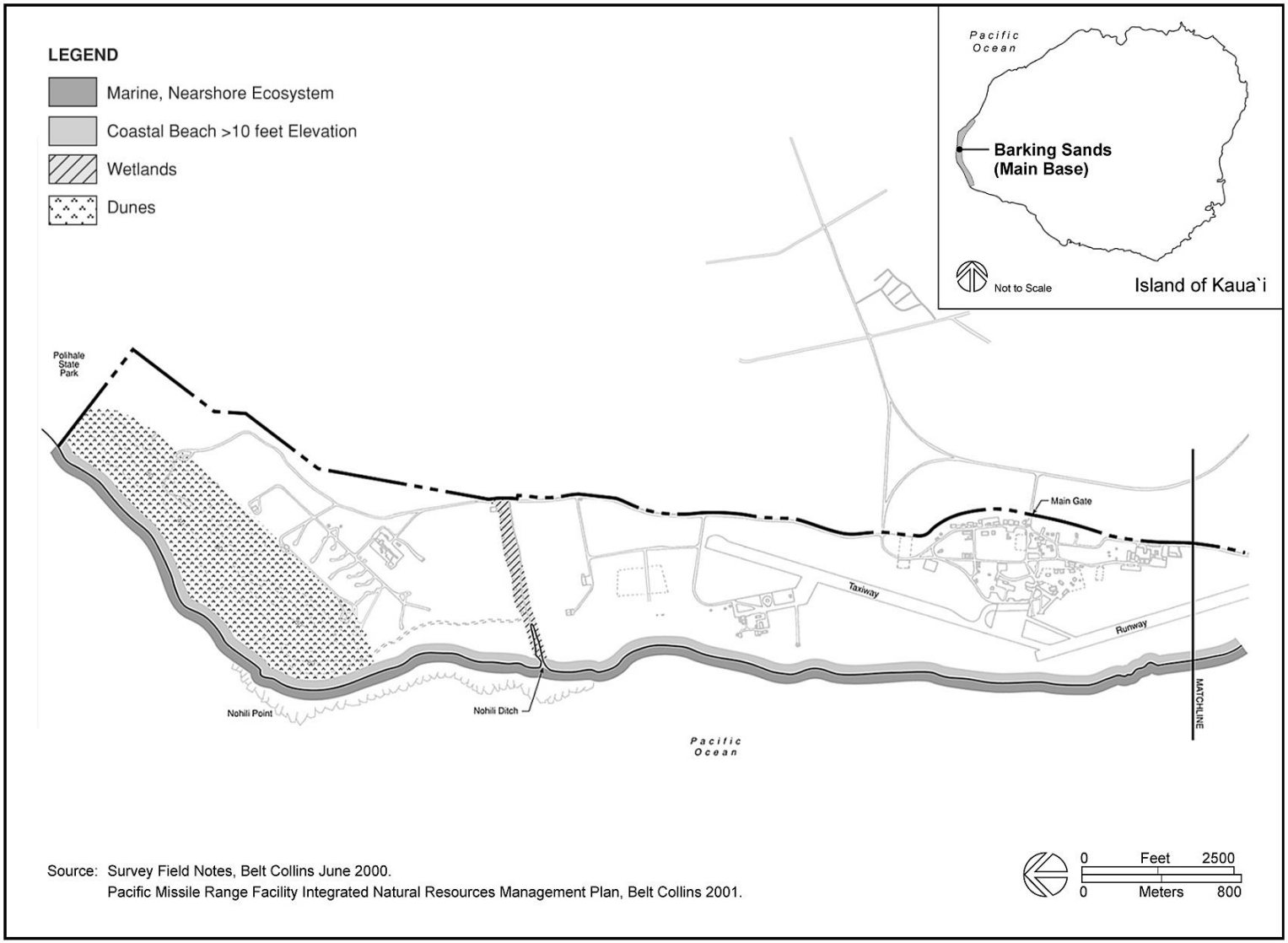


Figure J-1: Significant Ecosystems of Barking Sands (Northern Section)

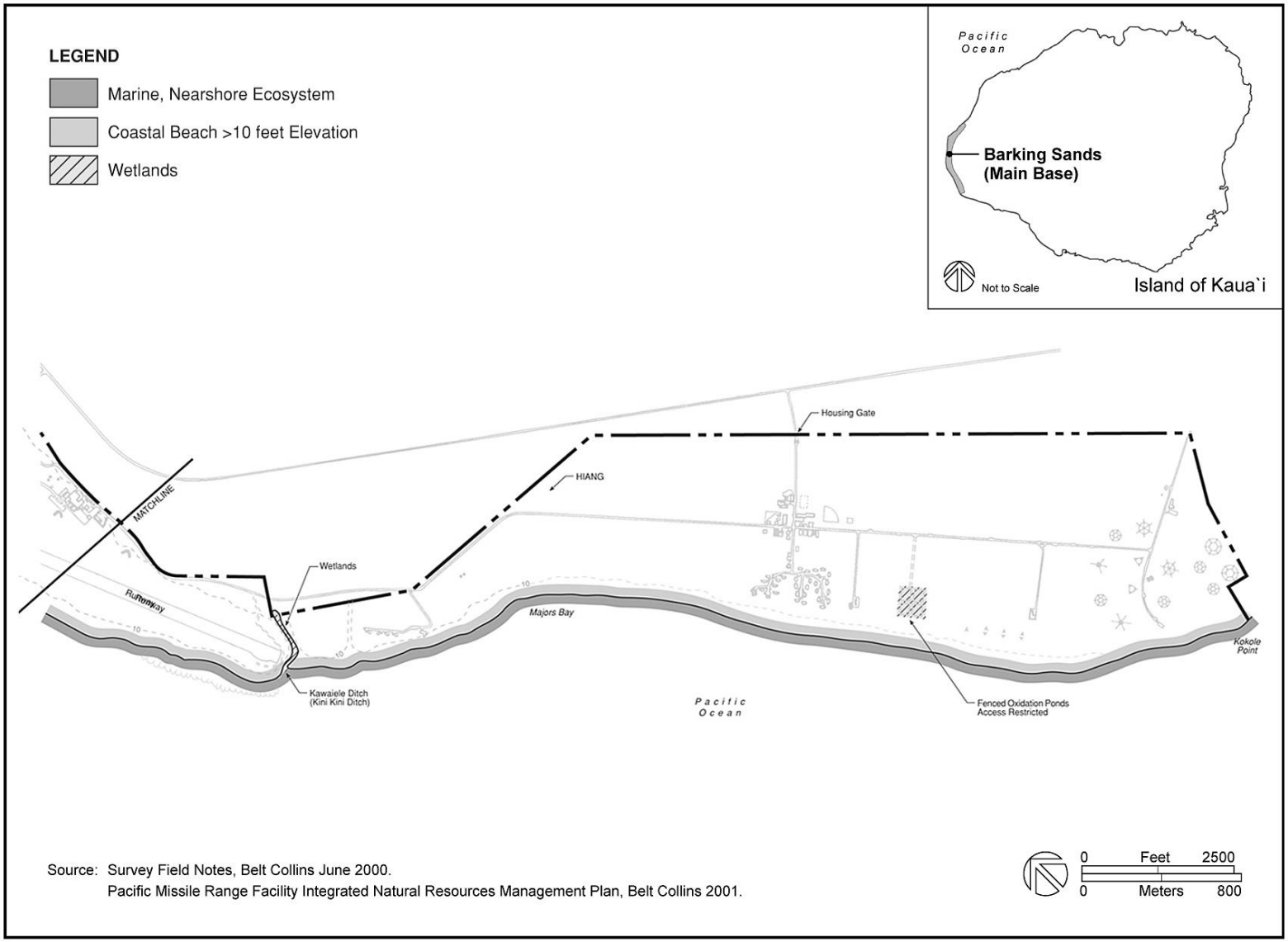


Figure J-2: Significant Ecosystems of Barking Sands (Southern Section)

J.5 PROTECTED SPECIES AND HABITATS

J.5.1 Plants

Currently, there are no known threatened or endangered plant species occurring at the Barking Sands facility. However, the U.S. Fish and Wildlife Service has designated critical habitat for the Lau‘ehu (Panicum Niihauense) at Polihale State Park and unoccupied sections of Barking Sands (see Figures J-3 and J-4). This designation restricts adverse modification to the constituent elements of the species. Threats to the species recovery include competition with non-native species, destruction from off-road vehicles, and naturally occurring catastrophic events. In addition, A`ali`i Nama Scrub habitat and Nohili dunes represent some of the last extant dryland coastal habitats on Kauai and contain several rare plant species, including Nama Sandwicencis and Chamaesyce Celastroides.

At the Makaha Ridge Tracking Station the Dwarf Ili‘au (Wilkesia Hobdyi), a federally-listed endangered species, occurs on the cliffs of the station overlooking Makaha Valley within the station boundary. Spermolepis Hawaiiensis, a federally-listed endangered plant species, can be found in two large colonies on north facing, precipitous slopes within the station boundary.

At the Kokee Facility the native montane forest remains relatively intact in some sites surrounding the facilities and landscaped areas and hosts rare Cyanea plants and a diverse rain forest community.

J.5.2 Bird Species

There are seven federally-listed endangered bird species that have been observed at Barking Sands. They include:

(1) Hawaiian Duck or Koloa (Anas Wyvilliana);
(2) Hawaiian Moorhen or Alae Ula (Gallinula Chloropus Sandwichensis);
(3) Hawaiian Coot or Alae Ke’oke’o (Fulica Alai);
(4) Hawaiian Stilt or Ae o (Himantopus Mexicanus Knudseni);
(5) Hawaiian Goose or Nene (Branta Sandvicensis);
(6) Newell’s Shearwater or ‘A’o (Puffinus Auricularis Newelli); and
(7) Short-tailed Albatross (Phoebastria Albatrus).

All federally-listed species under the Endangered Species Act (ESA) are also State of Hawaii listed species. Figures J-5 and J-6 show the protected bird species habitats at Barking Sands.

The Hawaiian Petrel (Pterodroma Sandwichensis) or ‘Ua‘u hasn’t been seen on Barking Sands, but may also fly over during the breeding season. A federal candidate seabird species, the Band-Rumped Storm-Petrel (Oceanodroma Castro) or ‘Ake‘ake also travels over Barking Sands during breeding season.

Hawaiian Duck: The Hawaiian Duck is a federally-listed endangered endemic waterbird that can be found at the oxidation ponds at Barking Sands. The Hawaiian Duck is generally mottled brown and has a green to blue speculum with white borders. They can begin breeding at one year old and nest year-round, but the main breeding season is between January and May. Two to ten eggs are laid in a well concealed nest lined with down and feathers. The incubation period is 30 days. Because their nests are established on the ground, they are highly vulnerable to predators. The species is vulnerable due to hybridization with domestic mallard, however the population on Kauai show a low rate of hybridization. Threats to the species

include: (1) loss of wetlands; (2) introduced predators (dogs, cats, rats, black-crowned herons, cattle egrets, barn owls, and non-native fish; (3) modifications to wetland habitats for flood control or to provide for municipal water sources; (4) invasive species including mangrove, pickleweed; and water hyacinth which reduce open water, mudflats, and shallows; (5) avian diseases including botulism; and (6) environmental contaminants including oil and fuel spills.

Hawaiian Moorhen: The Hawaiian Moorhen is a federally-listed endangered endemic black waterbird that can be observed along the drainage ditches at Barking Sands. Breeding occurs year round, but peaks from March through August. Nesting phenology is apparently tied to water levels and the presences of appropriately dense emergent vegetation. Platform nests are constructed in dense vegetation over water. They lay approximately five to six eggs in a nest and have an incubation period of 19-22 days. The species uses a variety of freshwater habitats. They are opportunistic feeders and their diet varies with habitat but may include algae, grass seeds, plant material, insects, and snails. Common Moorhens are very secretive and, thus, are hard to monitor. Threats to the species include: (1) loss of coastal plain wetlands; (2) introduced predators (dogs, cats, rats, cattle egrets, barn owls, and bullfrogs; (3) modifications to wetland habitats for flood control or to provide for municipal water sources; (4) invasive species including mangrove, pickleweed; and water hyacinth which reduce open water, mudflats, and shallows; (5) avian diseases including botulism; and (6) environmental contaminants including oil and fuel spills.

Hawaiian Coot: The Hawaiian Coot is a federally-listed endangered endemic waterbird that inhabit the drainage ditches at Barking Sands. The species is somewhat gregarious and uses freshwater and brackish wetlands, including agricultural (e.g., taro fields) wetlands and aquaculture ponds. They are generalists and feed on land, from the surface of the water or will dive; they will also graze on grass adjacent to wetlands. Food items include seeds and leaves, snails, crustaceans, insects, tadpoles, and small fish. Nesting habitats includes freshwater and brackish ponds, irrigation ditches, and taro fields. Floating nests are constructed of aquatic vegetation and found in open water or anchored to emergent vegetation. They normally breed from March to September, but may breed during all months of the year. The incubation period is approximately 25 days, with fledging time unknown. Similar to other Hawaiian native waterbirds, the Hawaiian Coot is threatened by habitat loss, introduced predators, altered hydrology, non-native invasive plants, and avian diseases.

Hawaiian Stilt: The Hawaiian Stilt is a Federal-listed endangered endemic waterbird that inhabits the drainage ditches and occasionally the beach at Barking Sands. They are black above and white below and have long, pink legs. The breeding season of the black-necked stilt normally runs from mid-February through late August, with peak nesting varying among years. They lay three to four eggs in a nest over a four to five day period, and have an incubation period of approximately 23 to 26 days. Threats to Hawaiian Stilt include introduced predators and loss of wetland habitats. Long-term census data suggests that the population statewide is stable or slightly increasing.

Hawaiian Goose: The federally-listed endangered Hawaiian Goose or Nene is the only native resident goose in Hawaii. This species has been observed at Barking Sands near the runway, beach cottages and Hawaii Air National Guard complex. On Kauai, Hawaiian geese typically breed and live in areas of managed grass below 984 ft (300 m) elevation; however, some Nene that were released along the Napali coast have moved to upland areas of managed grass. Hawaiian geese eat leaves of grass and other plants, berries, seeds, and flowers. Their primary predators on Kauai are short-eared owls, barn owls, rats, pigs and dogs. Hawaiian goose egg-

laying occurs from November to January with an average incubation period of 30 days. The young stay with the parents for about one year.

Newell's Shearwater: The federally-listed threatened Newell's Shearwater is a pelagic seabird that is endemic to the Hawaiian Islands. Newell's shearwaters nest only at high elevation on Kauai and so do not breed on Barking Sands; however, the species does fly over the base when traveling between nesting sites and at-sea foraging areas. Adult males and females are sooty brown above, with white throat and underparts, and have dark bill with a hooked tip. This species often forages in large, mixed species flocks associated with schools of large predatory fishes which drive prey species to the surface. They feed mainly by pursuit-plunging; individuals dive into water and swim using their partly folded wings for propulsion. Their diet is not well known, but likely consists of fish and squid.

Newell's shearwaters are colonial and nest on steep mountain slopes with variable amounts of vegetation, where they lay a single egg in burrows, which are often placed at the base of a tree. Breeding is highly synchronous with eggs laid in early June, and most young fledging by November. Both parents incubate the egg and brood and feed the nestling. Parents forage hundreds of kilometers offshore and return to the colony at night to feed the chick.

Threats to the species include historic hunting by humans, introduced predators (e.g., dogs, pigs, rats, barn owls, cats, etc.), habitat loss, artificial lighting, overfishing, disease, and natural catastrophes. Artificial lighting such as street and resort lighting, especially in coastal areas, disorients fledglings, causing them to eventually fall to the ground exhausted or increase their chance of colliding with an artificial structure.

Short-Tailed Albatross: The Short-Tailed Albatross is a federally-listed endangered seabird as well as a Migratory Bird Treaty Act (MBTA) protected bird. These birds are mostly white with varying amounts of black, mostly on the upper side of the wings, and a golden wash on the head. It has a huge pink bill that has a bluish tip and legs and feet are pale pink. Threats include humans, commercial activity, and introduced predators. This bird species is the largest seabird found in Hawaii. Currently, it is very rare with the majority of sightings being recorded on Midway Atoll.

Hawaiian Petrel: The federally-listed endangered Hawaiian petrel is a large, nocturnal gadfly petrel endemic to Hawaii. Hawaiian petrels have not been observed at Barking Sands, but like the Newell's shearwaters may fly over the base when traveling between nesting and foraging areas. Adult males and females are uniformly dark grayish black above forming a collar which contrasts with a white throat, forehead, and cheeks. The birds are entirely white below, except for black tail and leading and trailing edges of the underwings. The bill is black and legs and feet are mostly pink. Even during the breeding season, Hawaiian petrels often feed thousands of kilometers from colonies, usually foraging with mix-species feeding flocks, typically over schools of predatory fishes. They feed by seizing prey while sitting on the water or by dipping prey while flapping just above the ocean surface. In Hawai'i, Hawaiian petrels feed primarily on squid, fish, and crustaceans.

Hawaiian petrels nest in colonies, form long-term pair bonds, and return to the same nest site year after year. Nests are in burrows, crevices or cracks in lava tubes. Most eggs are laid in May and June and most juveniles fledge by December. Both parents incubate a single egg and brood and feed the chick.

On Kauai, habitat includes wet forests with a dense understory of fern. Threats include historic human hunting, introduced predators (dogs, pigs, rats, and cats), and artificial lighting.

Band-Rumped Storm-Petrel: As with Newell's shearwaters, Band-Rumped Storm-Petrels nest at high elevations on Kauai and fly over Barking Sands during trips between nesting and foraging sites. The Band-Rumped Storm-Petrel occurs throughout the Pacific and Atlantic oceans, breeding in Japan, the Galapagos Islands, Hawai'i, and eastern Atlantic islands off of the coasts of Europe and Africa. While not considered to be threatened across its global range, the Band-Rumped Storm-Petrel has been listed as a candidate for endangered species status under the ESA. In the Hawaiian Archipelago, Band-Rumped Storm-Petrels are known to nest on Kauai and are thought to nest on the islands of Hawaii and Maui. The known breeding colony on Kauai is restricted to steep cliffs dominated by native plant species. Nesting is thought to begin in April in Hawaii, with juveniles fledging from the nests in October. Threats include ingested contaminants and plastics, degradation of nesting and foraging habitats, and collisions with structures.

J.5.3 Mammalian Species

There is one federal and state-listed terrestrial mammalian species, the Hawaiian Hoary Bat or 'Ope'Ape'a (*Lasiurus Cinereus Semotus*), and two federally-listed and state-listed aquatic mammalian species at Barking Sands: (1) the endangered Hawaiian Monk Seal or *Ilio-Holo-I-Ka-Uaua* (*Monachus Schauinslandi*); and (2) the endangered Humpback Whale or K*ohola* (*Megaptera Novaeangliae*).

Hawaiian Hoary Bat: The federal and state-listed endangered and endemic Hawaiian Hoary Bat has been recorded at Barking Sands. The Hawaiian Hoary Bat is Hawaii's only native terrestrial mammal. Males and females have a wingspan of approximately 1 ft and have a coat of brown and gray fur. They roost in native and non-native vegetation from 3-29 ft above ground level. They begin foraging either just before or after sunset and feed on a variety of native and non-native night-flying insects including moths, beetles, crickets, mosquitoes, and termites. Coastlines and forest/pasture boundaries appear to be important foraging areas. Mating most likely occurs between September and December, and females give birth to twins during May or June. Mother bats likely stay with their pups until they are six to seven weeks old. Habitat loss, pesticides, predation, and roost disturbance affect bats. A reduction in tree cover (e.g. roost sites) might be the primary reason for the species' decline in Hawaii.

Monk Seals: There are frequent sightings of the endangered Hawaiian Monk Seal both in nearshore waters and hauled out on beaches all around Kauai, including the vicinity of Barking Sands. Pups have been born in the immediate area of Barking Sands in recent years (see Figures J-5 and J-6). Monk Seal pups are nursed for approximately two months and will remain in the general area where they were born throughout most of this stage and often after weaning.

Humpback Whales: During the winter breeding season from December through May the federal and state-listed endangered Humpback Whales are present in coastal waters, primarily within water depths of 985 ft of the main Hawaiian Islands, including areas off of Barking Sands. Part of the Hawaiian Islands Humpback Whale National Marine Sanctuary is located along Kauai's north shore and provides protected habitat for the whales (approximately nine nautical miles) to the northeast of PMRF. According to Kauai DLNR Division of Aquatic Resources staff, whales and calves are also spotted in the channel between Kauai and Niihau.

J.5.4 Reptilian Species

There are two federal-protected marine reptiles at Barking Sands. All sea turtles are protected under the federal ESA. The threatened Green Sea Turtle or Honu (Chelonia Mydas) is actually quite common in the Hawaiian Islands and is found at Barking Sands. The endangered Hawksbill Turtle or Honuea (Eretmochelys Imbricata) is considered rare compared to the threatened green sea turtle.

Green Sea Turtles: As adults, Green Sea Turtles forage and rest in the shallow waters around the main Hawaiian Islands. Reproduction in the Hawaiian population occurs primarily in the Northwest Hawaiian Islands (NWHI), but green sea turtles have been noted to use the Barking Sands sand beaches for nesting (see Figures J-5 and J-6). Adults migrate to the isolated NWHI in the summer to nest and return to the main Hawaiian Islands in late summer or early fall. Nesting occurs on sandy beaches above the high tide mark; upon hatching, juvenile green sea turtles enter the ocean where they presumably take up a pelagic existence until attaining a carapace length of about 12 inches. At this size, young green sea turtles take up residence in nearshore waters around the main Hawaiian Islands.

In the nearshore habitat, green sea turtles will rest during the day along ledges or in caves in coastal waters at depths usually from 40 ft to 82 ft. Under the cover of darkness, green sea turtles will travel inshore to shallow subtidal and intertidal habitats to forage on selected species of marine algae. The normal range of these daily movements between resting and foraging areas is believed to be 0.6 miles or less. Thus, the ideal green sea turtle habitat in Hawaiian waters consists of suitable resting areas (caves, depressions, ledges, and undercuts) located within 0.6 miles of abundant algal pastures situated in shallow water. The physical habitat at the mouth of Nohili Ditch provides such an ideal habitat, while also providing potential nesting grounds. Recent visual reconnaissance of the nearshore area off Nohili Point revealed numerous green sea turtles on the surface, particularly off the mouth of Nohili Ditch.

The combination of desirable nesting beaches, foraging habitat, and resting habitat all situated within a small geographic area combine to provide an ideal “complete habitat” for Green Sea Turtles in the immediate area of Nohili Ditch. The suitability of the forage area is enhanced by the combination of ideal intertidal physiography (limestone bench) and the abundance of preferred forage species of algae that are a response to nutrient subsidies provided by the freshwater discharge from Nohili Ditch.

Hawksbill Turtle: The Hawksbill Turtle has been reported in the open waters offshore Kauai. There are no known records of hawksbills coming ashore or nesting within or adjacent to the Barking Sands. Hawksbill turtles are most often found in shallow water around reefs, bays, and inlets. Nesting areas are extremely critical to the survival of the species, which prefers areas with woody cover for nesting. The main threats to the species are the reduction of nesting beaches due to construction and human presence, including vehicles, artificial lighting, nest predation, and exotic vegetation. In addition, marine debris from active and ghost fishing lines and lay nets cause incidental take. Pollutants and boat collisions may also be a threat.

J.6 OTHER PROTECTED SPECIES

J.6.1 Bird Species

Fourteen migratory birds protected under the MBTA occur at Barking Sands. They are summarized below.

Laysan Albatross: The Laysan Albatross is a native seabird and is a small albatross. They are monogamous and typically begin pair bonding in November. Eggs are laid from mid-November through mid-December. The eggs hatch from mid-June through mid-July leading to a mean incubation of 64.4 days. Fledging occurs during the middle of July. This species attempts to nest adjacent to runway and is subject to relocation to prevent Bird-Aircraft Strike Hazard.

Black-Footed Albatross: The Black-Footed Albatross is a State-listed threatened as well as a MBTA-protected, native seabird. It is one of the smaller albatross with a wing span of 6.3 to 7.1 ft. They breed concurrently with Laysan Albatross. Like Laysan Albatross, Black-Footed Albatross lay one egg per breeding attempt. The mean incubation period is 65.6 days. They fledge in mid-July.

Brown Booby: The Brown Booby is a large, striking, native seabird. It most often forages in large, mixed species flocks associated with schools of large predatory fishes that drive prey species to the surface. It is the only ground nesting booby that builds a nest, and its construction is an important part of courtship. In Hawaii, peak egg laying occurs between March and May and chicks fledge by September.

Wedge-Tailed Shearwater: Wedge-Tailed Shearwaters are native pelagic seabirds. There are two colonies located at Barking Sands. Wedge-tailed shearwaters breed from February through November. They are ground-nesting birds that dig burrows in the sand. The typical breeding/ burrowing areas are low, flat islands and sandpits with little or no vegetation. The known predators of adult wedge-tailed shearwaters are rats, domestic dogs, and feral cats. On Kauai, nestlings have been taken by barn owls and mynas have been known to eat the eggs.

Black-Crowned Night Heron: The Black-Crowned Night Heron is a native, medium-sized heron (waterbird). They are opportunistic feeders, eating items ranging from aquatic and terrestrial insects to lizards, snakes, eggs, and plant materials. Breeding occurs in Hawaii from May to June.

Cattle Egret: Non-native shorebird introduced to Hawaii. It is a small white heron often found on pastures and roadsides. It is an opportunistic feeder that eats insects as well as other birds. It is included in the MBTA but is not protected in Hawaii.

Northern Shoveler: The Northern Shoveler is a common North American dabbling duck that winters in the MHI, typically arriving in September and October and departing for Alaska by March or April. They utilized a variety of wetland habitats, including freshwater and saline marshes, and agricultural ponds.

Green-Winged Teal: This is a non-native, very small, brightly patterned duck. It prefers shallow ponds with lots of emergent vegetation. Along the coast, it prefers tidal creeks, mudflats, and marshes to more open water.

Pacific Golden Plover: Pacific Golden Plovers are a medium-sized plover that, during the winter months, occupy upland and coastal habitats in the Hawaiian Islands. They leave Hawaii in April to migrate to Alaska to breed and return to Hawaii in August.

Black-Bellied Plover: This is a non-native, large shorebird of coastal beaches. The species has been observed at the beach at Barking Sands. On its wintering grounds, it roosts in dense flocks but spreads out over sandy and muddy flats to forage as the tide recedes. Although generally a coastal bird, it also forages successfully in freshwater and upland habitats.

Wandering Tattler: The Wandering Tattler winters in the Hawaiian Islands. Adults arrive from July to August and juveniles from September to November. This species forages in intertidal habitats such as coral reefs and less frequently in soft mud or sand. They may also forage along mountain streams, in wetlands, fish ponds, and human-modified areas.

Ruddy Turnstone: The Ruddy Turnstone is a small, calico-colored shorebird that winter on the shorelines of the main Hawaiian Islands. While in Hawaii, they are almost exclusively coastal, foraging mostly along stony or rocky shorelines with abundant seaweed and commonly on sandy shorelines and in mudflats and river deltas.

Sanderling: The Sanderling or Sandpiper is well-known for its habit of foraging at the edge of the surf zone and running up and down the beach to avoid waves while probing the sand for invertebrates. They winter in Hawaii (as well as other locations) and prefer to forage on sandy beaches, tidal flats, and mudflats.

Laughing Gull: The laughing gull is a smallish gull distinguished by its black head and is an occasional visitor to Hawaii. The species has been observed at the beach at Barking Sands.

J.6.2 Marine Mammals

Spinner Dolphins (Stenella Longirostris), Spotted Dolphins (S. Artenuata), Bottlenose Dolphins (Tursiops Truncates Gilli), False Killer Whales (Psuedorca Crassidens), Pilot Whales (Globicephala Macrorhynchus), Melon Headed Whales (Peponcephala Electra), and Pygmy Killer Whales (Feresa Attenuate) are some of the non-listed marine mammals that can occur in the waters off of Barking Sands. There are other species of small cetaceans that may be present in coastal waters but are generally cryptic and not often observed. These are protected species under the Marine Mammal Protection Act (MMPA) of 1972 but are not Federal or State listed as threatened or endangered.

Spinner Dolphins: Spinner Dolphins are known to rest in bays and other protected waters around the Hawaiian Islands and there are several schools known to occur around Kauai. Spinner Dolphins have a well-defined home range and can be found with a high degree of regularity in the same area. They spend considerable time close to shores in waters 45 ft or less in depth. The typical diurnal activity pattern of spinner dolphins is an early morning period of school movement and high activity, followed by a calmer period lasting the remainder of the day. In the late afternoon, high activity recommences during which time the smaller groups may join together and head seaward, presumably to feed during the night. Prey species consumed by spinner dolphins are primarily mesopelagic fish and epipelagic squid, suggesting the use of offshore feeding areas.

In addition, Spotted Dolphins, Bottlenose Dolphins, False Killer Whales, Pilot Whales, Melon Headed Whales, and Pygmy Killer Whales are likely to be found in the coastal waters off of Kauai.

J.7 TERRESTRIAL PLANTS

Botanical surveys of Barking Sands recognized six vegetation types on the undeveloped portions of the PMRF Barking Sands, which cover roughly six hundred acres of the facility (see Figures J-3 and J-4).

Kiawe-Koa Haole Scrub: This scrub occupies roughly four hundred acres and is found throughout the facility. This scrub vegetation varies from tall, dense forests in the more protected areas along the inland portion of the facility to low, windswept thickets along the oceanfront.

A alii-Nama Scrub: This scrub covers about 100 acres and is found on the southern half of the property.

Pohinahina-Naupaka Dune Vegetation: This vegetation occurs on the seaward facing slopes of the sand dunes at Nohili Point.

Strand Vegetation: This vegetation occurs as a narrow band along the coastline and is poorly developed in most places.

Drainageway/Wetlands Vegetation: This vegetation is found along and in the two drainage ditches crossing the base and in association with the ditch that runs along a portion of the mauka (inland) boundary. But the ditch easement is reserved to the state for operations and maintenance.

Ruderal Vegetation: This vegetation is found along the roadways and also on areas that are infrequently maintained.

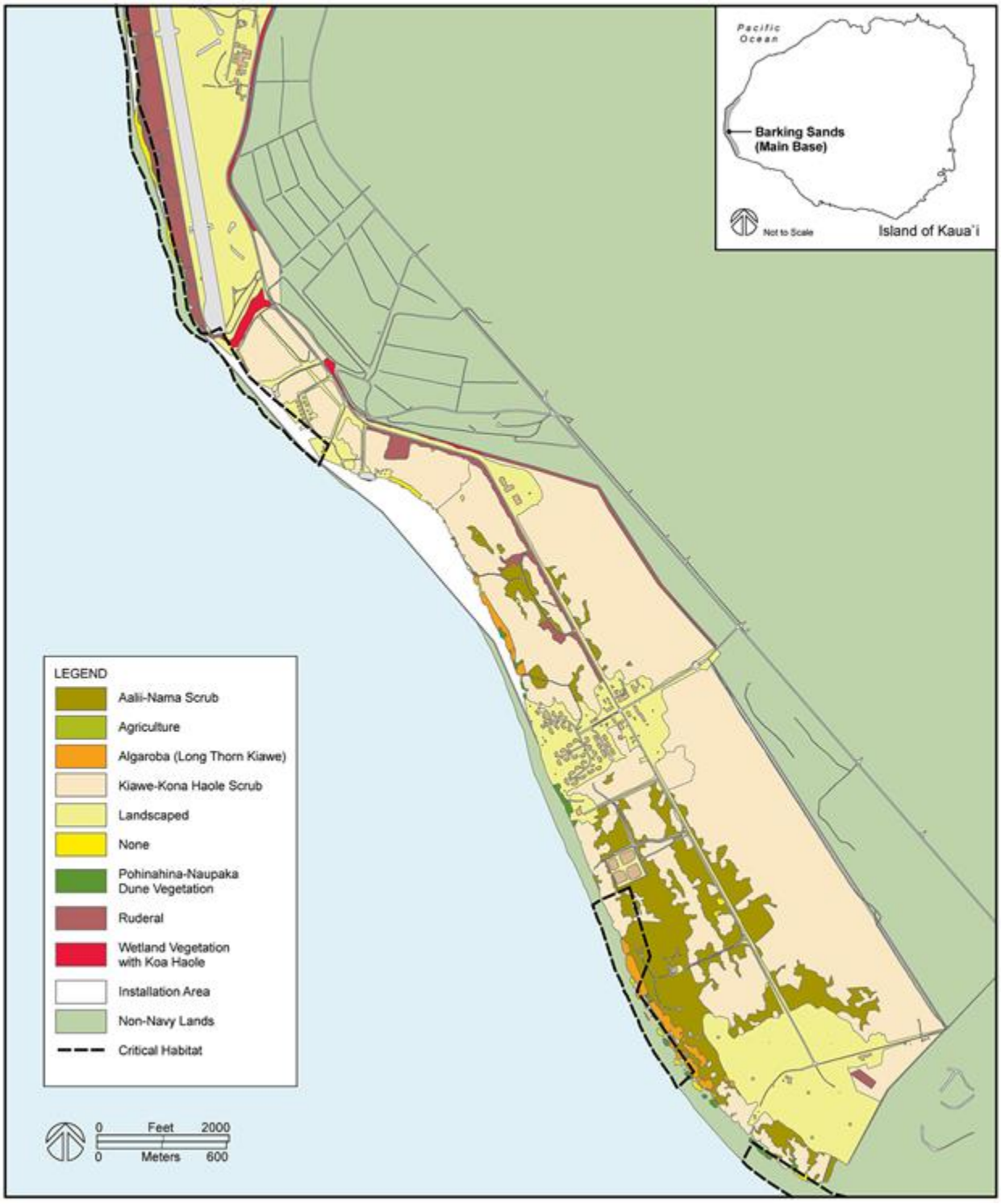


Figure J-3: Barking Sands Vegetation Types (Northern Section)

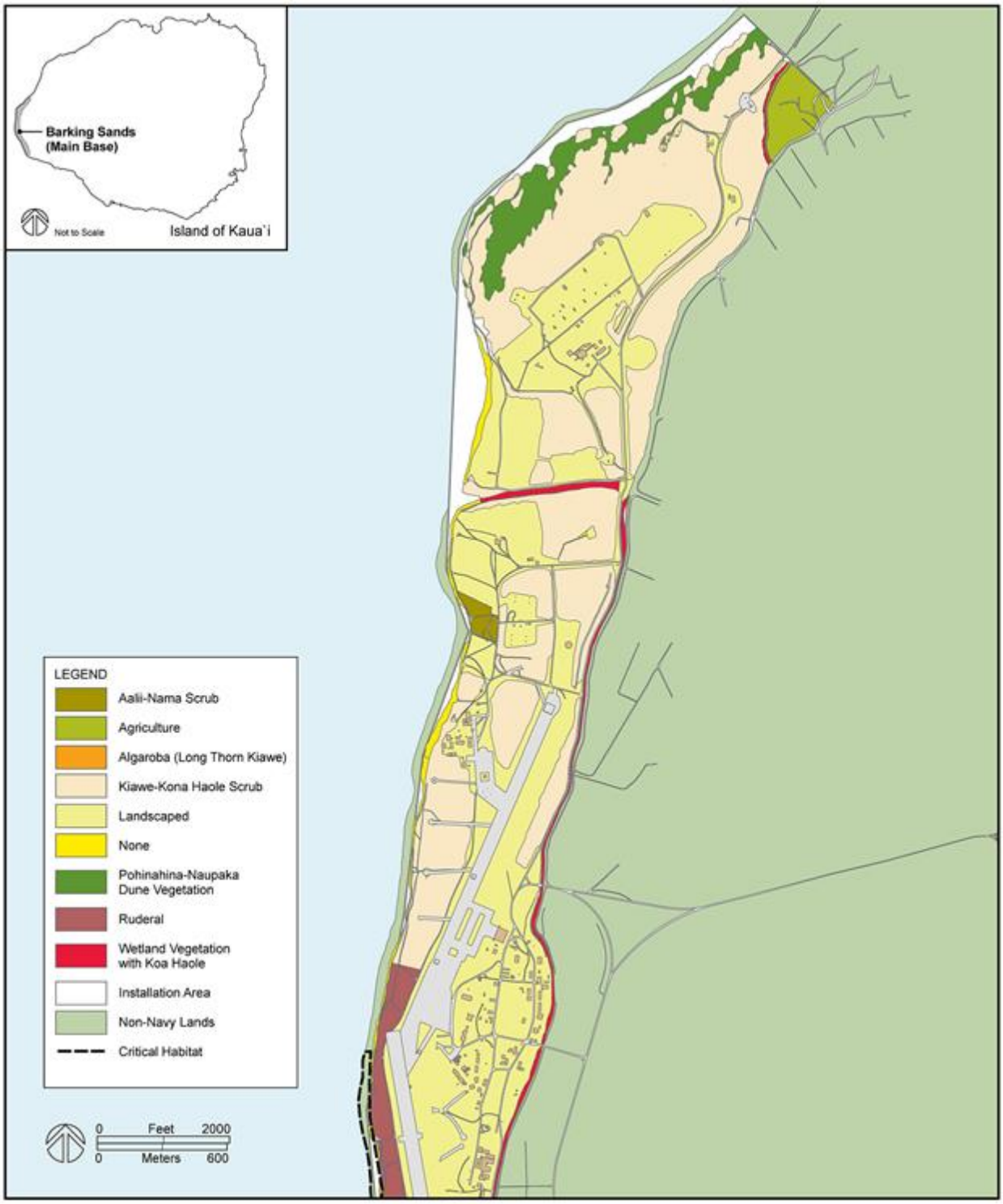


Figure J-4: Barking Sands Vegetation Types (Southern Section)

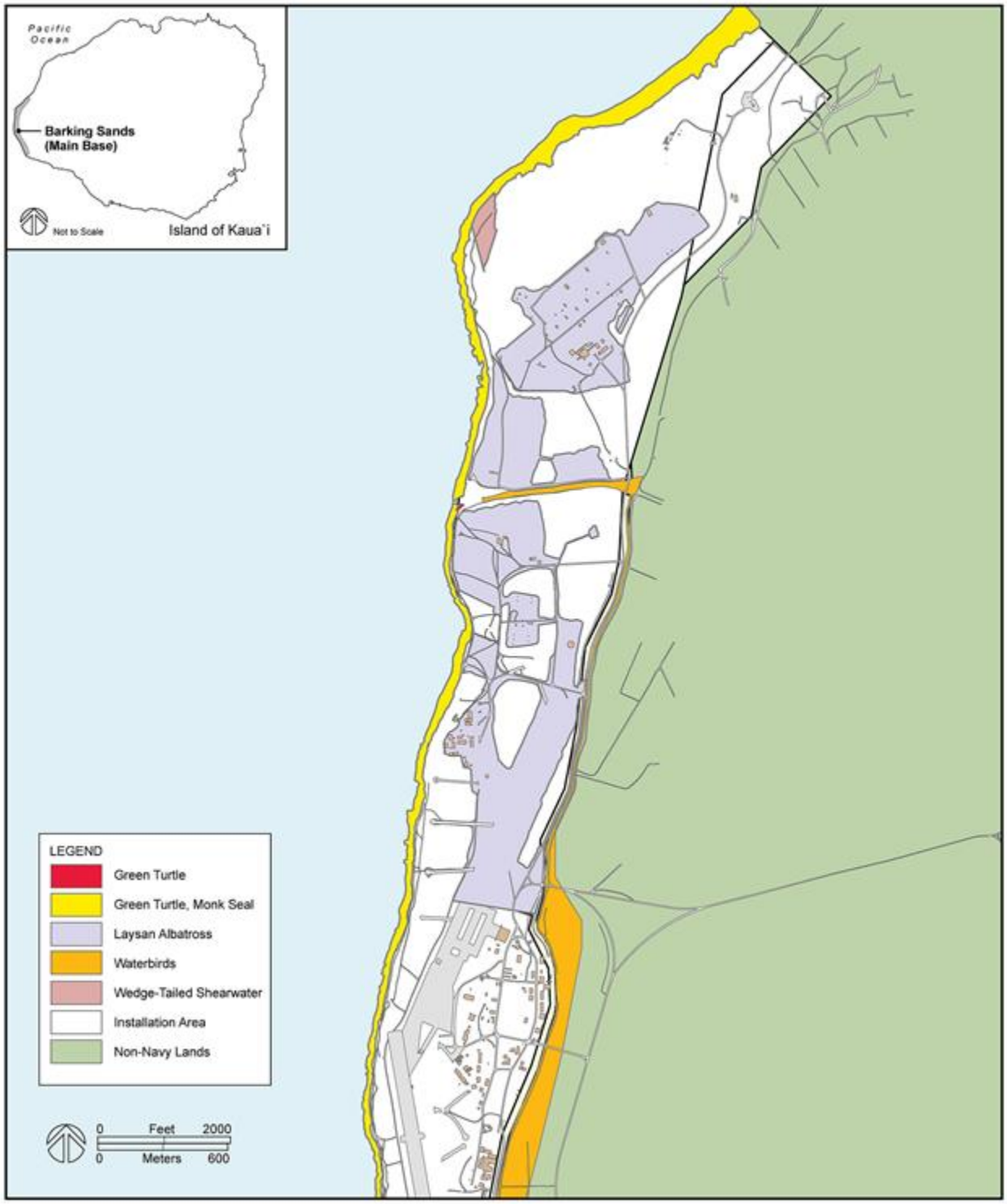


Figure J-5: Barking Sands Protected Animals Habitat (Northern Section)

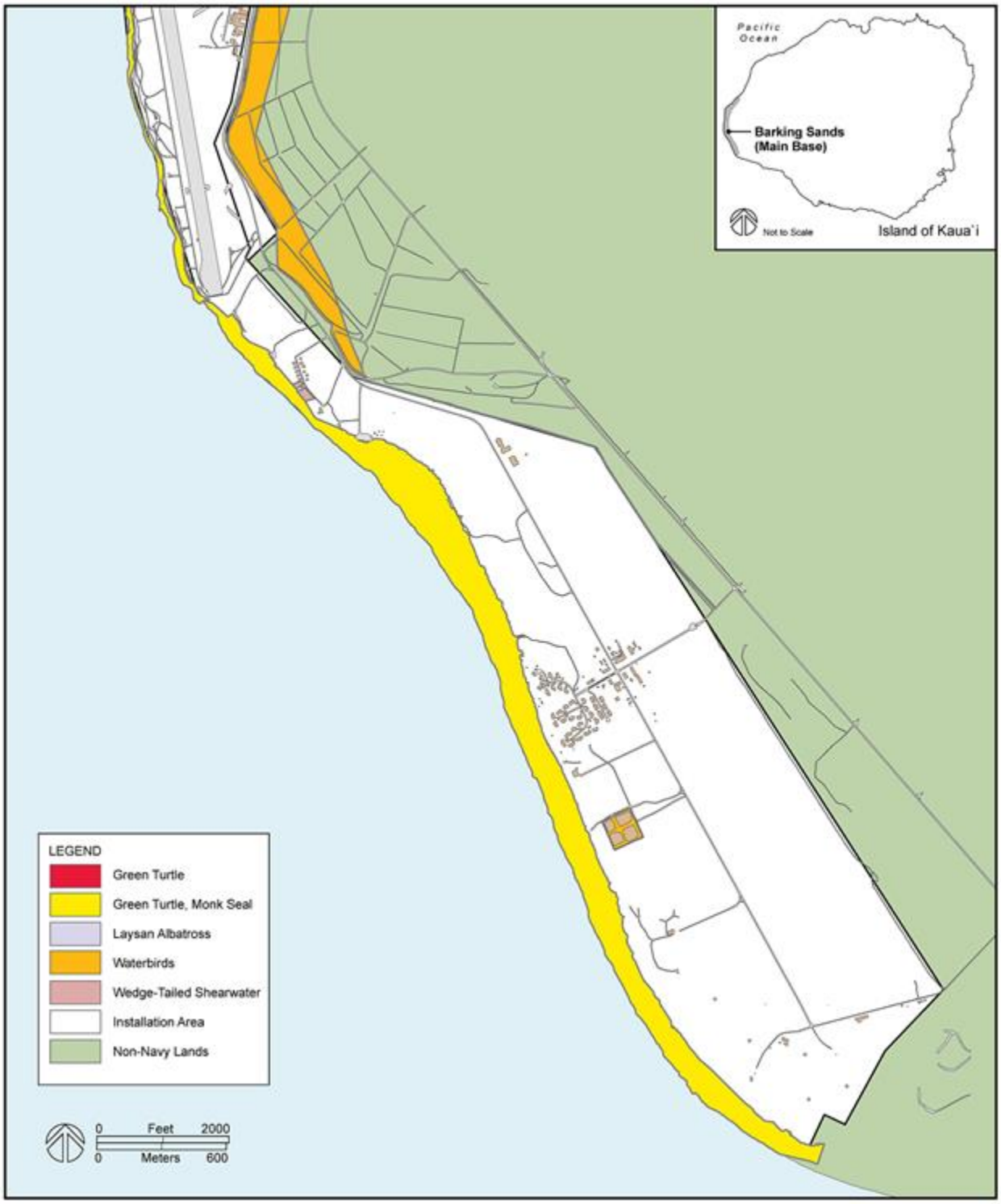


Figure J-6: Barking Sands Protected Animals Habitat (Southern Section)

J.8 EVIRONMENTAL SENTSITIVIY INDEX MAPS

Environmental Sensitivity Index (ESI) maps provide a concise summary of coastal resources that are at risk if an oil or hazardous substance spill occurs nearby. Examples of at-risk resources include biological resources (such as birds and shellfish beds), sensitive shorelines (such as marshes and tidal flats), and human-use resources (such as public beaches and parks).

When an oil or hazardous substance spill occurs, ESI maps can help responders meet one of the main response objectives: reducing the environmental consequences of the spill and the cleanup efforts. The ESI maps for PMRF Barking Sounds are presented at the end of this appendix along with a map index.

J.9 CULTURAL RESOURCE NOTIFICATIONS

Navy

The cultural resources point of contact for PMRF is:

LCDR John Baise, CEC, USN
NAVFAC HI PMRF Public Works Officer
Phone: (808) 335-4635; Fax: (808) 335-4683; Email: john.baise@navy.mil

The cultural resource point of contact for CNRHI is:

Ellyn P. Goldkind, RA
Historic Preservation Officer
Navy Region Hawaii
400 Marshall Rd.
Bldg. X-11, Code EV5
Pearl Harbor, HI 96860-3139
Phone: (808) 471-1171, Ext. 356; Email: ellyn.goldkind@navy.mil

State

Hawaii State Historic Preservation Offices:

Administrator
Kakuhihewa Building
601 Kamokila Blvd., Suite 555
Kapolei, HI 96707
Phone: (808) 692-8015; Fax: (808) 692-8020; Email: dlnr@hawaii.gov

Kauai State Historic Preservation Division
P.O. Box 1729, Lihue, Hawaii 96766
Phone: (808) 692-8015; Fax: (808) 692-8020

J.10 HAWAII NATURAL RESOURCE TRUSTEES

J.10.1 Federal Trustees

Secretary of Commerce is the trustee over natural resources managed/controlled by the Department of Commerce; resources found in navigable waters (deep draft), tidally influenced waters, waters of contiguous zone, exclusive economic zone, and outer continental shelf.

National Marine Fisheries Service - Pacific Islands Regional Office
NOAA IRC
1845 Wasp Blvd., Bldg. 176
Honolulu, HI 96818
Phone: (808) 725-5000; Fax: (808) 725-5215; Email: piro.info@noaa.gov

Secretary of Interior is the trustee over natural resources managed/controlled by Department of Interior; examples include: migratory birds, anadromous fish, endangered species, marine mammals, minerals, federal water resources.

U.S. Fish & Wildlife Service - Pacific Islands
300 Ala Moana Blvd., Room 3-122
Honolulu, HI 96850
Phone: (808) 792-9400; Fax: (808) 792-9580; Email: pifwo_admin@fws.gov

Secretary for the Land Managing Agency is the Trustee for the natural resources located on land they manage. The trustee is the head of the department in which the land managing agency is found.

U.S. Department of Agriculture
Natural Resources Conservation Service
Prince Kuhio Federal Bldg.
300 Ala Moana Blvd. Room 4-118
Honolulu, HI 96850
Phone: (808) 541-2600; Fax: (808) 541-1335

U.S. Navy

Commanding Officer
Naval Facilities Engineering Command, Hawaii
400 Marshall Rd., JBPHH, HI 96860
Phone: (808) 471-3926; CDO: (808) 347-8289
Regional Environmental: (808) 471-3858

J.10.2 State Trustees

For the State of Hawaii the trustees are the Department of Land and Natural Resources and the Department of Health - HEER Office. The Department of Health is the lead trustee.

Hawaii Department of Land and Natural Resources

Division of Aquatic Resources
1151 Punchbowl St., Room 330
Honolulu, HI 96813
Phone: (808) 587-0100; Fax: (808) 587-0115; Email: DLNR.aquatics@hawaii.gov

Historic Preservation Division
Kakuhihewa Building
601 Kamokila Blvd., Suite 555
Kapolei, HI 96707
Phone: (808) 692-8015; Fax: (808) 692-8020; Email: dlnr@hawaii.gov

Kahoolawe Island Reserve Commission (KIRC)
811 Kolu St., Suite 201
Wailuku, HI 96793
Phone: (808) 243-5020; Fax: (808) 243-5885; Email: administrator@kirc.hawaii.gov

Hawaii Department of Health

Hazard Evaluation and Emergency Response Office
2385 Waimano Home Rd., Suite 100
Pearl City, Hawaii 96782
Phone: (808) 586-4249; Fax: (808) 586-7537

J.11 STAKEHOLDERS

Many of these groups are government agencies that are responsible for the management and the upkeep of a specific area but are not the designated trustee.

Hawaii Department of Transportation - Harbors Division

Hale Awa Ku Moku Building
79 South Nimitz Highway
Honolulu, HI 96813
Ph: (808) 587-1928; Fax: (808) 587-4543

Office of Hawaiian Affairs

4405 Kukui Grove St., Suite 103
Lihue, HI 96766
Ph: (808) 241-3390; Fax: (808) 241-3508

NOAA – Hawaiian Islands Humpback Whale National Marine Sanctuary

NOAA/DKIRC
ATTN: NOS/HIHWNMS
1845 Wasp Blvd., Bldg. 176
Honolulu, HI 96818
Ph: (808) 725-5901; or (808) 725-5903

HAWAII

SHORELINE HABITATS

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

HUMAN-USE FEATURES

- AIRPORT
- AQUACULTURE
- ARCHAEOLOGICAL SITE
- ARTIFICIAL REEF
- BOAT RAMP
- COMMERCIAL FISHING
- CRITICAL HABITAT
- DIVE SITE
- HISTORIC FISHPOND
- MARINA
- MARINE SANCTUARY
- NATIONAL PARK
- RECREATIONAL BEACH
- RECREATIONAL FISHING
- SPECIAL MANAGEMENT AREA
- STATE / REGIONAL PARK
- SUBSISTENCE FISHING / COLLECTING
- SURFING
- WATER INTAKE
- WILDLIFE REFUGE
- 123 HUMAN-USE NUMBER
- 10 BATHYMETRY (FATHOMS)
- MANAGEMENT AREA

SENSITIVE BIOLOGICAL RESOURCES

BIRD

- GULL / TERN
- PASSERINE BIRD
- RAPTOR
- SEABIRD
- SHOREBIRD
- WADING BIRD
- WATERFOWL
- NESTING SITE

MARINE MAMMAL

- DOLPHIN
- WHALE
- SEAL
- PUPPING / HAUL-OUT SITE

FISH

- FISH
- NATIVE STREAM / RARE SPECIES OCCURRENCE

INVERTEBRATE

- BIVALVE
- CRAB / OTHER INVERTEBRATES
- ECHINODERM
- GASTROPOD
- INSECT
- LOBSTER
- OCTOPUS
- SHRIMP
- NATIVE STREAM / RARE SPECIES OCCURRENCE

REPTILE

- TURTLE
- NESTING SITE / OCCURRENCE

HABITAT

NATIVE / RARE PLANT

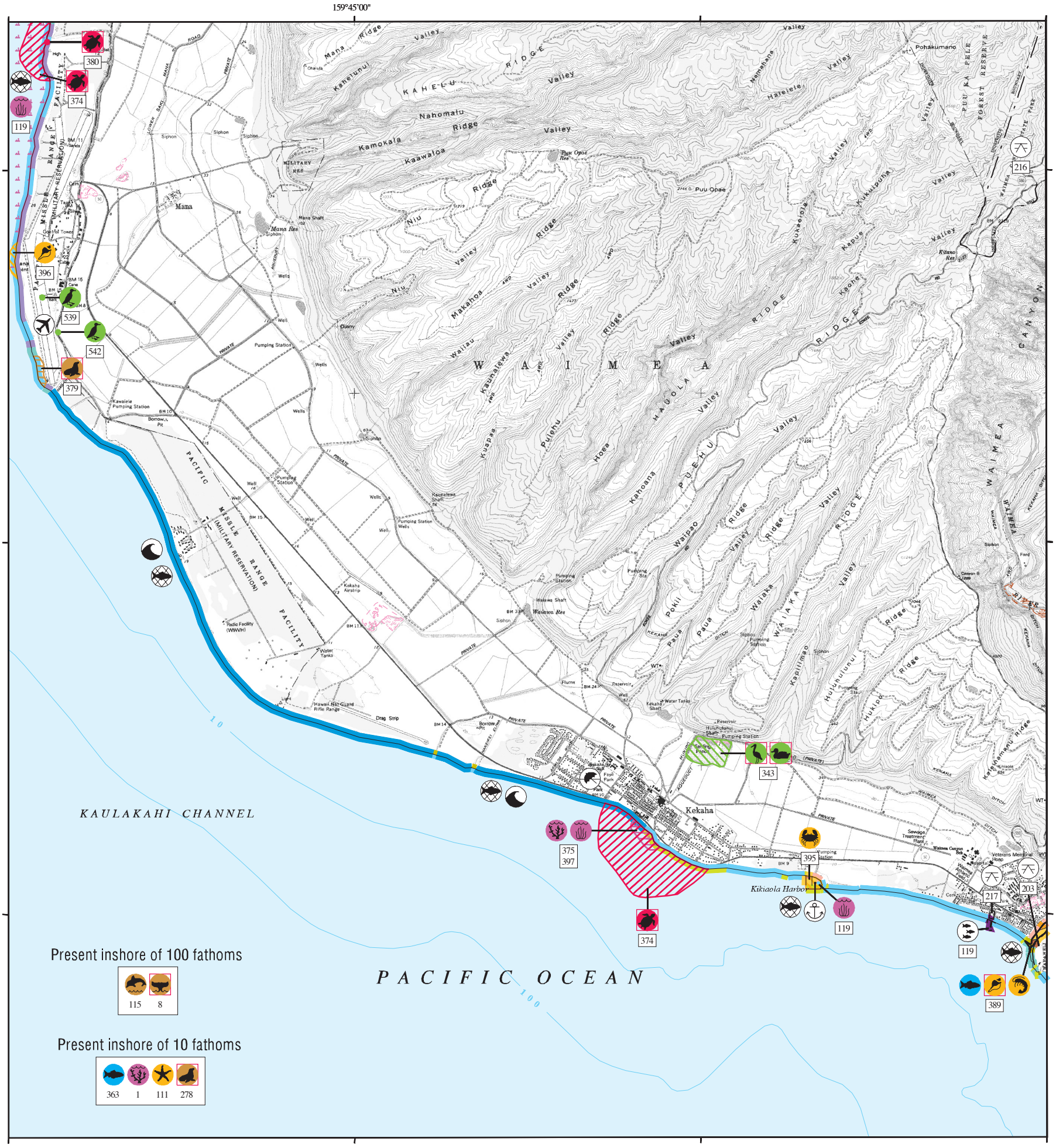
- NATIVE / RARE PLANT

BENTHIC MARINE HABITAT

- ALGAE / SEAGRASS
- CORAL
- ANCHIALINE POOL
- CORAL AREA OF SPECIAL SIGNIFICANCE
- MULTI-GROUP
- THREATENED / ENDANGERED
- 123 RAR NUMBER

This Page Intentionally Left Blank.

ENVIRONMENTAL SENSITIVITY INDEX MAP



SHORELINE HABITATS (ESI)

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

PRESENT IN AREA:

Shorebirds — Archaeological Sites *

*SEE INTRO PAGES FOR CONTACT INFORMATION

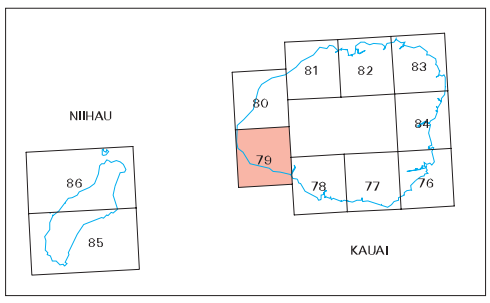
N W E S

SCALE 1:55000

1 .5 0 1 KILOMETER

1 .5 0 1 MILE

Not For Navigation



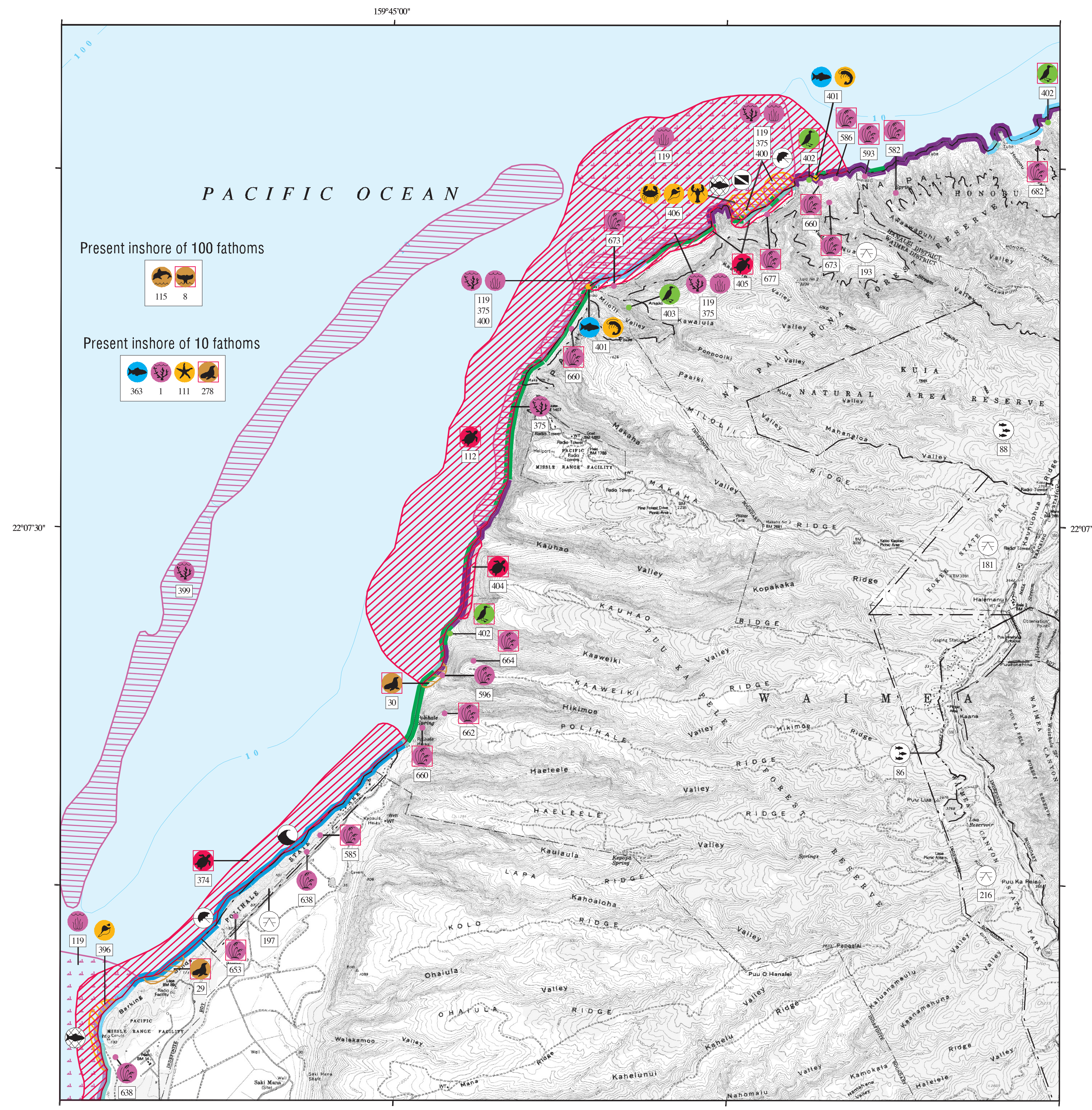
Published: July 2001

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

KEKAHA, HI (1983) **HI-79**

This Page Intentionally Left Blank.

ENVIRONMENTAL SENSITIVITY INDEX MAP



SHORELINE HABITATS (ESI)

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

PRESENT IN AREA:

Shorebirds
Archaeological Sites*

*SEE INTRO PAGES
FOR CONTACT INFORMATION

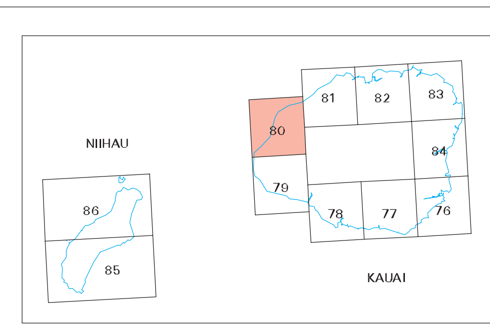
N
W E
S

SCALE 1:55000

1 .5 0 1 KILOMETER

1 .5 0 1 MILE

Not For Navigation



Published: July 2001

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

MAKAHA POINT, HI (1983) HI-80

This Page Intentionally Left Blank.

APPENDIX K
UNDERGROUND STORAGE TANK RELEASE RESPONSE ACTIONS

K.1 GENERAL

Owners and operators of petroleum or hazardous substance Underground Storage Tank (UST) systems must, in response to a confirmed release from a UST system, comply with the requirements of Subchapter 6, "Release Response Action", of the Hawaii Administrative Rules, Title 11, Chapter 11-280.1, entitled Underground Storage Tanks. This appendix was written to meet these requirements. Other UST requirements under Chapter 11-280.1 are covered in the PMRF UST Management Plan.

K.2 PMRF USTs

There are a total of ten USTs currently in use at PMRF. Nine USTs are owned by the US Navy and operated by the Base Operations Systems (BOS) contractors managed by Department of Defense (DoD) agencies, with the exception of the Navy Exchange (NEX). One UST is owned and operated by Sandia National Laboratory. The ten UST are as follows:

- Power Plant, Building 112, Tank 1 - Class A/B operator: PMRF Environmental (EV) staff; Class C/Daily Operators: BOS Power Plant staff
- Calibration Laboratory, Building 516, Tank M-1 - Class A/B operator: PMRF EV staff; Class C/Daily Operators: BOS Power Plant staff
- NEX Gas Station, Building 1291, Tanks 1 and 2 - Class A/B operator: NEX Manager; Class C/Daily Operators: NEX staff
- Fuel Farm, Building 551, Tanks F-4, F-6, F-7, F-8, and F-9 - Class A/B operator: BOS Fuel Farm Manager; Class C/Daily Operators: BOS Fuel Farm staff
- Sandia National Laboratory, Building 686, Tank 686 - Class A/B operator: Sandia National Laboratory staff; Class C/Daily Operators: Sandia National Laboratory staff

An inventory of USTs is provided in Table K-1. See Figures K-1 through K-5 at the end of this appendix for maps showing the location of each UST.

PMRF EV staff includes the Installation Environmental Program Director/Environmental Coordinator, and Environmental Protection Specialists. PMRF EV staff prepares all reports for submission to the Hawaii Department of Health (DOH), via NAVFAC HI Environmental Compliance, Code EV12.

K.3 IMMEDIATE RESPONSE ACTIONS

Upon confirmation of a release or after a release from the UST system is identified, Class A/B operators must be contacted to ensure the following response actions are taken within twenty-four hours:

1. If the mission is not critical, take necessary actions to prevent any further release of the regulated substance into the environment;
2. Report the release to Emergency Dispatch at 335-4333 (on base), and Crash Fire will arrive to identify and mitigate any safety hazards (such as fire, explosion, and vapor hazards) posed by the release of the regulated substance;
3. Report the release to the CDO at 651-6402, and continue to take necessary action to minimize the spread of contamination; and
4. Report the release to the PMRF EV team at 335-4942 or 4064 who will report to DOH, Solid and Hazardous Waste Branch, at 586-4226, 586-7509 (fax).

Class A/B operators must ensure a written notice confirming the release is submitted to DOH within seven days of confirmation of a release. The PMRF EV team will assist with the DOH "Confirmed Release Notification Form" (Form K-1) on page K-9. Note that mailing instructions are on the form.

K.3.1 Posting of Signs

If DOH determines that posting of signs is appropriate, Class C/Daily Operators shall post signs around the perimeter of the site informing passersby of the potential hazards. In this instance, "site" means an area where contamination poses an immediate health risk or an area where contaminated media is exposed to the surface. Signs shall be placed at each entrance to the site and at other locations in sufficient numbers to be seen from any approach to the site.

Signs shall be legible and readable from a distance of at least twenty-five feet. The sign legend shall read, "Caution-Petroleum/Hazardous Substance Contamination-Unauthorized Personnel Keep Out". Other sign legends may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the site and that entry onto the site may be dangerous. A contact person and telephone number shall be listed on the sign.

The sign may be removed upon determination by DOH that no further release response action is necessary or that posting of signs is no longer appropriate.

K.4 INITIAL ABATEMENT MEASURES AND SITE ASSESSMENT

Class A/B operators must ensure the following abatement measures are taken:

1. Continue to remove as much of the regulated substance from the UST system as is necessary to prevent further release to the environment;
2. Visually inspect the area around the UST or tank system for evidence of any aboveground releases or exposed below ground releases and continue to take necessary actions to minimize the spread of contamination and to prevent further migration of the released substance into surrounding soils, air, surface water, and groundwater;
3. Continue to monitor and mitigate any additional fire and safety hazards posed by vapors or free product that have migrated from the UST excavation zone and entered into subsurface structures (such as sewers);
4. Remedy hazards (such as dust and vapors and the potential for leachate generation) posed by contaminated soils and debris that are excavated or exposed as a result of release confirmation, site investigation, abatement, or release response action activities;
5. Conduct an assessment of the release by measuring for the presence of a release where contamination is most likely to be present at the UST site. In selecting sample types, sample locations, and measurement methods, the BOS Environmental, Safety, and Health and PMRF EV team shall consider the nature of the stored substance, the type of backfill and surrounding soil, depth and flow of groundwater and other factors as appropriate for identifying the presence and source of the release;
6. Investigate to determine the possible presence of free product, and begin free product removal;
7. Remove or remediate contaminated soil at the site to the extent necessary to prevent the spread of free product; and
8. If any of the actions in this section include treatment or disposal of contaminated soils, owners or operators must comply with all applicable local, state, and federal requirements.

Table K-1 provides an inventory of USTs located at PMRF.

TABLE K-1: PMRF UNDERGROUND STORAGE TANKS

Tank ID / Former Tank ID	Facility/Location	DOH Facility ID	Facility Type	Date Installed	Product	Capacity (Gal)	Tank Material	Piping Material
1 / 112	Power Plant, Building 112	9-701094	Power Plant	11/1996	Diesel	30,000	Fiberglass Reinforced Plastic	Double-walled Fiberglass Reinforced Plastic
M-1 / M-516A	Calibration Laboratory, Building 516	9-700463	Calibration Laboratory	10/1996	Diesel	1,000	Fiberglass Reinforced Plastic	Double-walled Fiberglass Reinforced Plastic
1 / 1291A	NEX Gas Station, Building 1291	9-701318	Gas Station	06/1996	Gasoline	5,000	Fiberglass Reinforced Plastic	Double-walled Fiberglass Reinforced Plastic
2 / 1291B	NEX Gas Station, Building 1291	9-701318	Gas Station	06/1996	Gasoline	5,000	Fiberglass Reinforced Plastic	Double-walled Fiberglass Reinforced Plastic
F-4 / F-522	Fuel Farm, Building 551	9-701304	Bulk Fuel Storage	04/1942	Jet-A	51,000	Field Constructed Welded Steel	Bare Steel
F-6 / F-524	Fuel Farm, Building 551	9-701304	Bulk Fuel Storage	04/1942	Jet-A	51,000	Field Constructed Welded Steel	Bare Steel
F-7 / F-525	Fuel Farm, Building 551	9-701304	Bulk Fuel Storage	04/1942	Jet-A	51,000	Field Constructed Welded Steel	Bare Steel
F-8 / F-526	Fuel Farm, Building 551	9-701304	Bulk Fuel Storage	04/1942	Jet-A	51,000	Field Constructed Welded Steel	Bare Steel
F-9 / F-527	Fuel Farm, Building 551	9-701304	Bulk Fuel Storage	04/1942	Jet-A	51,000	Field Constructed Welded Steel	Bare Steel
686	Sandia National Laboratory, Building 686	Unk.	Fuel Storage	Unk.	Diesel	1,500	Unk.	Unk.

Notes:

1. The Fuel Farm Tanks (F-4, F-6, F-7, F-8, and F-9) are single wall steel, horizontal cylindrical in design, internal epoxy coated, equipped with external cathodic protection, and ATG probes that can provide monthly 0.2 gph monthly leak detection testing.
2. Fuel Farm Tanks F-1, F-2, F-3, and F-5 were taken out of service in 2021.
3. Tanks provide fuel via aboveground pipelines to a truck loading/off-loading rack located within the Fuel Farm.

Within twenty days after release confirmation, the PMRF EV team must submit a report to DOH summarizing the initial abatement steps taken under this section and any resulting information or data.

K.5 INITIAL SITE CHARACTERIZATION

The PMRF EV team must assemble information about the site and the nature of the release, including information gained while confirming the release or completing the initial abatement measures. This information must include the following:

1. Data on the nature and estimated quantity of release;
2. Data from available sources and all previous site investigations concerning the following factors: surrounding populations, water quality, use and approximate locations of wells potentially affected by the release, subsurface soil conditions, locations of subsurface sewers, climatological conditions, and land use;
3. Results of the site assessment; and
4. Results of the free product investigations, to be used by owners and operators to determine whether free product must be recovered.

Within forty-five days of release confirmation, the PMRF EV team must submit the information collected in this section to DOH.

K.6 FREE PRODUCT REMOVAL

At sites where investigations indicate the presence of free product, the owner and operators must remove free product to the maximum extent practicable as determined by DOH. In meeting the requirements of this section, *both* owner and operators must ensure the following tasks are completed:

1. Conduct free product removal in a manner that minimizes the spread of contamination into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site, and that properly treats, discharges or disposes of recovery byproducts in compliance with applicable local, state, and federal regulations;
2. Use abatement of free product migration as a minimum objective for the design of the free product removal system;
3. Handle any flammable products in a safe and competent manner to prevent fires or explosions; and
4. Prepare and submit to DOH, within forty-five days after confirming a release, a free product removal report that provides at least the following information:
    a. The name of the person responsible for implementing the free product removal measures;
    b. The estimated quantity, type, and thickness of free product observed or measured in wells, boreholes, and excavations;
    c. The type of free product recovery system used;
    d. Whether any discharge will take place on-site or off-site during the recovery operation and where this discharge will be located;
    e. The type of treatment applied to, and the effluent quality expected from, any discharge;
    f. All actions already performed or currently underway to remove free product, including steps that have been or are being taken to obtain necessary permits for any discharge;
    g. The disposition of the recovered free product; and
    h. Schedule for completion of free product removal.

Both owners and operators must ensure the initiation of free product removal as soon as practicable but no later than thirty days following confirmation of a release.

K.7 INVESTIGATIONS FOR SOIL AND GROUNDWATER CLEANUP

In order to determine the full extent and location of soils contaminated by the release and the presence and concentrations of dissolved product contamination in the groundwater and surface water, the owner and operators must ensure the investigations of the release, the release site, and the surrounding area possibly affected by the release if any of the following conditions exist:

1. There is evidence that groundwater wells have been affected by the release (e.g., as found during release confirmation or previous release response actions);
2. Free product is found to need recovery;
3. There is evidence that contaminated soils may be in contact with groundwater (e.g., as found during conduct of the initial response measures or investigations; and
4. DOH requests an investigation, based on the potential effects of contaminated soil or groundwater on nearby surface water and groundwater resources.

The PMRF EV team will include information collected in accordance with this section with each quarterly report required per Section K.7.2 below.

K.7.1 Notification of Confirmed Releases to the Public

Notification to the public is not required, as members of the public would not be affected by any release from a UST system on PMRF. All UST systems are located on Navy owned property and permitted through the Navy Region Hawaii/NAVFAC HI EV department.

K.7.2 Release Response Reporting

No later than ninety days following the confirmation of a release, the PMRF EV team must submit to DOH a written report. The report must include:

1. All release response actions taken pursuant to this appendix during the first ninety-day period (first quarter); and
2. A plan for future release response actions to be taken.

Beginning one hundred eighty days following confirmation of a release, the PMRF EV team must submit to DOH written quarterly progress reports and an electronic copy of the written report. The reports must document:

1. All response actions taken pursuant to this appendix after the last reported date;
2. A plan for future release response actions to be taken; and
3. Information required pursuant to Section K.7.1 of this appendix.

Quarterly progress reports are not required if:

1. Response actions have met the requirements of Section K.7.3 of this appendix; and
2. A final quarterly report has been submitted.

K.7.3 Site Cleanup Criteria

Both the owner and operators must ensure the remediation of soil, surface water, and groundwater, and materials contaminated by releases from USTs or tank systems in a manner that is protective of human health and the environment and achieves cleanup as described below.

Both the owner and operators must ensure the remediation of contaminated soil, groundwater, and surface water at the site to residual concentrations that meet one of the following criteria:

1. Default Tier 1 Screening Levels as presented in Table K-2 below; or
2. Site-specific action levels as approved by DOH. Owners and operators should consult with DOH on how the standards can be met. Site-specific action levels must take into account the following factors:

   (a). For systemic toxicants, acceptable levels shall represent concentration levels to which the human population may be exposed without adverse effect during a lifetime or part of a lifetime, and incorporating an adequate margin of safety;
   (b). For known or suspected carcinogens, acceptable levels are generally concentration levels in soil, groundwater and vapor that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6} using information on the relationship between dose and response. The 10^{-6} excess risk level shall be used as the point of departure for determining acceptable levels for alternatives when chemical-specific state or federal requirements are not available or are not sufficiently protective because of the presence of multiple contaminants at the site or multiple pathways of exposure;
   (c). Impacts to ecological receptors, including but not limited to plants and animals; and
   (d). Other applicable requirements, including but not limited to nuisance concerns for odor and taste, if applicable.

DOH may require the owner and operators to modify cleanup activities being performed at a site if DOH determines that the activities are not being carried out in accordance with this appendix, or are not achieving cleanup levels that are protective of human health and the environment. DOH may impose modifications to cleanup activities by written notice to the owners and operators, and the owners and operators must implement necessary changes to the cleanup activities in response to the DOH notice by a time schedule established by DOH.

A schedule for estimated completion of site cleanup shall be included in each fourth quarter report required pursuant to Section K.7.2 of this appendix.

K.8 CORRECTIVE ACTION PLAN

DOH may require that the owner and operators submit a written corrective action plan for responding to a release, if one or more of the following minimum threshold criteria are met:

1. Actual or probable release to groundwater which is a drinking water supply;
2. Actual or probable release to surface water which is a drinking water supply;
3. Actual or probable release to air that poses a threat to public health;
4. Actual or probable release to and extensive contamination of soil that poses a direct contact hazard due to uncontrolled access;
5. Actual or probable existence of uncontrolled regulated substances that pose a direct contact hazard due to uncontrolled access;
6. Actual or probable adverse impact to natural resources;
7. Actual or probable imminent danger of fire or explosion; or
8. A determination by the director that a release poses a substantial endangerment to public health or welfare, the environment, or natural resources.

If a plan is required, the PMRF EV team will prepare a plan to be submitted to DOH in a format established by DOH and within thirty days of the DOH request, unless an extension of time is granted by DOH.

Corrective action plans, which are required to be submitted to DOH, shall be subject to the review and discretionary approval of DOH in accordance with the procedures set forth in this section. *Both* the owner and operators are responsible for ensuring submittal of a corrective action plan that provides for adequate protection of human health and the environment as determined by DOH and must make necessary modifications to the plan when directed to do so by DOH.

DOH will approve the corrective action plan only after ensuring that implementation of the plan will adequately protect human health, safety, and the environment. In making this determination, DOH will consider the following factors as appropriate:

1. Physical and chemical characteristics of the regulated substance, including its toxicity, persistence, and potential for migration;
2. Hydrogeologic characteristics of the facility and the surrounding area;
3. Proximity, quality, and current and future uses of nearby surface water and groundwater;
4. Potential effects of residual contamination on nearby surface water and groundwater;
5. An exposure assessment; and
6. All other information assembled in compliance with this subchapter.

Upon approval of a corrective action plan, the owner and operators must implement the plan, including any modifications to the plan made by DOH. The owner and operators must monitor, evaluate, and report quarterly to DOH the results of implementing the corrective action plan pursuant to this section and Section K.7.2.

Owners and operators who have been requested by DOH to submit a corrective action plan are encouraged to begin cleanup of contaminated soils, surface water, groundwater, and materials before the plan is approved by DOH provided that they:

1. Notify DOH of their intention to begin cleanup;
2. Ensure that cleanup measures undertaken are consistent with the cleanup actions required pursuant to Section K.7.3;
3. Comply with any conditions imposed by DOH, including halting cleanup or mitigating adverse consequences from cleanup activities; and
4. Incorporate self-initiated cleanup measures in the corrective action plan that is submitted to DOH for approval.

K.9 PUBLIC PARTICIPATION FOR CORRECTIVE ACTION PLANS

Public participation for corrective action plans is not required, as members of the public would not be affected by any release from a UST system on PMRF. All UST systems are located on Navy owned property.

TABLE K-2: TIER 1 SCREENING LEVELS FOR SOIL AND GROUNDWATER

Contaminant	DRINKING WATER SOURCE THREATENED				DRINKING WATER SOURCE NOT THREATENED			
	Groundwater (ug/l)	Basis[1]	Soil (mg/kg)	Basis[2]	Groundwater (ug/l)	Basis[3]	Soil (mg/kg)	Basis[2]
Acenaphthene	N/A[4]	-	120	L/VI	N/A[4]	-	120	L/VI
Benzene	5.0	DWP	0.30	L	71	CAT	0.77	VI
Benzo(a)pyrene	N/A[4]	-	3.6	DE	N/A[4]	-	3.6	DE
Dichloroethylene, cis 1,2-	70	DWP	0.36	VI	620	CAT	0.36	VI
Dichloroethylene, trans 1,2-	100	DWP	3.6	VI	560	CAT	3.6	VI
Ethylbenzene	7.3	CAT	0.90	L	7.3	CAT	0.90	L
Fluoranthene	N/A[4]	-	87	L	N/A[4]	-	87	L
Lead	5.6	CAT	200	DE	5.6	CAT	200	DE
Methyl Tert Butyl Ether (MTBE)	5.0	DWS	0.028	L	730	CAT	2.3	VI
Naphthalene	12	CAT	3.1	L	12	CAT	3.1	L
Polychlorinated Biphenyls (PCBs)	N/A[4]	-	1.2	DE	N/A[4]	-	1.2	DE
Tetrachloethylene (PCE)	5.0	DWP	0.098	VI	53	CAT	0.098	VI
Toluene	9.8	CAT	0.78	L	9.8	CAT	0.78	L
TPH-gasolines	300	DWP	100	GC	500	CAT	100	GC
TPH-middle distillates	400	DWP	220	DE	640	CAT	220	DE
TPH-residual fuels	500	DWS	500	GC	640	CAT	500	GC
Trichloroethylene	5.0	DWP	0.089	VI	47	CAT	0.089	VI
Vinyl Chloride	2.0	DWP	0.036	VI	18	VI	0.036	VI
Xylenes	13	CAT	1.4	L	13	CAT	1.4	L

Notes to Table K-2:

1. Drinking water screening levels are the lowest of screening levels for: drinking water primary maximum contaminant levels based on toxicity ("DWP"), drinking water secondary maximum contaminant levels based on taste and odor concerns ("DWS"), vapor intrusion ("VI"), and chronic aquatic toxicity ("CAT").
2. Soil screening levels are the lowest of screening levels for: direct exposure ("DE"), vapor intrusion ("VI"), leaching ("L"), and gross contamination ("GC").
3. Non-drinking water screening levels are the lowest of screening levels vapor intrusion ("VI"), chronic aquatic toxicity {"CAT"), and gross contamination ("GC").
4. Testing for acenaphthene, benzo(a)pyrene, fluoranthene, and PCBs in groundwater is not necessary due to low solubility and low mobility. Cleanup of contaminated soil will be adequate to address potential groundwater concerns.

FORM K-1: CONFIRMED RELEASE NOTIFICATION FORM

STATE USE ONLY		
Facility ID:	Release ID:	Date Received:

GENERAL INFORMATION AND INSTRUCTIONS

This form should be completed immediately and only after reporting a confirmed release by telephone within 24-hours to the Hawai`i DOH UST Section. Completion of this notice will serve to fulfill part of the notification requirements of HAR 11- 280.1-61. Please type or print in ink all items except "Signature" in Section III. This form must be completed for **each UST release occurrence**. Completed form must be mailed to: Department of Health, Solid and Hazardous Branch, 2827 Waimano Home Road #100, Pearl City, Hawaii 96782

I. REPORTING PARTY AND FACILITY INFORMATION

24-Hour Reporting Party Name, Title, Affiliation: Phone Number:

Facility Name & Address:

Facility Contact Person, Affiliation, & Address:

Landowner Name, Affiliation & Address:	Lessor Name, Affiliation & Address:	Lessee Name, Affiliation & Address:
E-mail address:	E-mail address:	E-mail address:
Phone Number ( )	**Phone Number ( )**	Phone Number ( )

II. RELEASE INFORMATION (Circle all that apply in Items A-I)

A. Source of the Release: Piping Tank(s) Overfill Problems Dispenser Submersive Turbine Pump **Delivery Problems**

If "Tank(s)" list tank sizes:

B. Cause of the Release: **Spill** **Overfill** **Physical / Mechanical Damage** **Corrosion** **Installation Problem**

Other (Specify):

C. Method of Discovery & Confirmation: Closure Monthly Release Detection Tightness Test Site Check

Other (Specify):

D. Estimated Quantity of Substance Released: _____ Gallons _____ Unknown

E. Type of Substance Released: Unleaded Gas Leaded Gas Diesel Used or Waste Oil Hazardous Substance

Other (Specify):

F. Immediate Hazards: Explosion Fire Vapor Exposure Recoverable Free Product Drinking Water Threat

Other (Specify):

G. Release Impact: Surface Water Ground Water Soil Air

H. Migration Pathways: None Utility Conduits Subsurface Drains Sewer Lines Unknown

Other (Specify):

I. Actions Taken: Evacuated Nearby Area Removed UST Contents Recovered Free Product Excavated Soils Ground Water Recovery

Other (Specify):

III. UST OWNER OR OPERATOR CERTIFICATION (Read and sign after completing all sections to the extent possible)

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

Name, Title, & Company:

Signature: Date:

DOH Form CRN (10/18)

FIGURE K-1: POWER PLANT, BUILDING 112

FIGURE K-2: CALIBRATION LAB, BUILDING 516

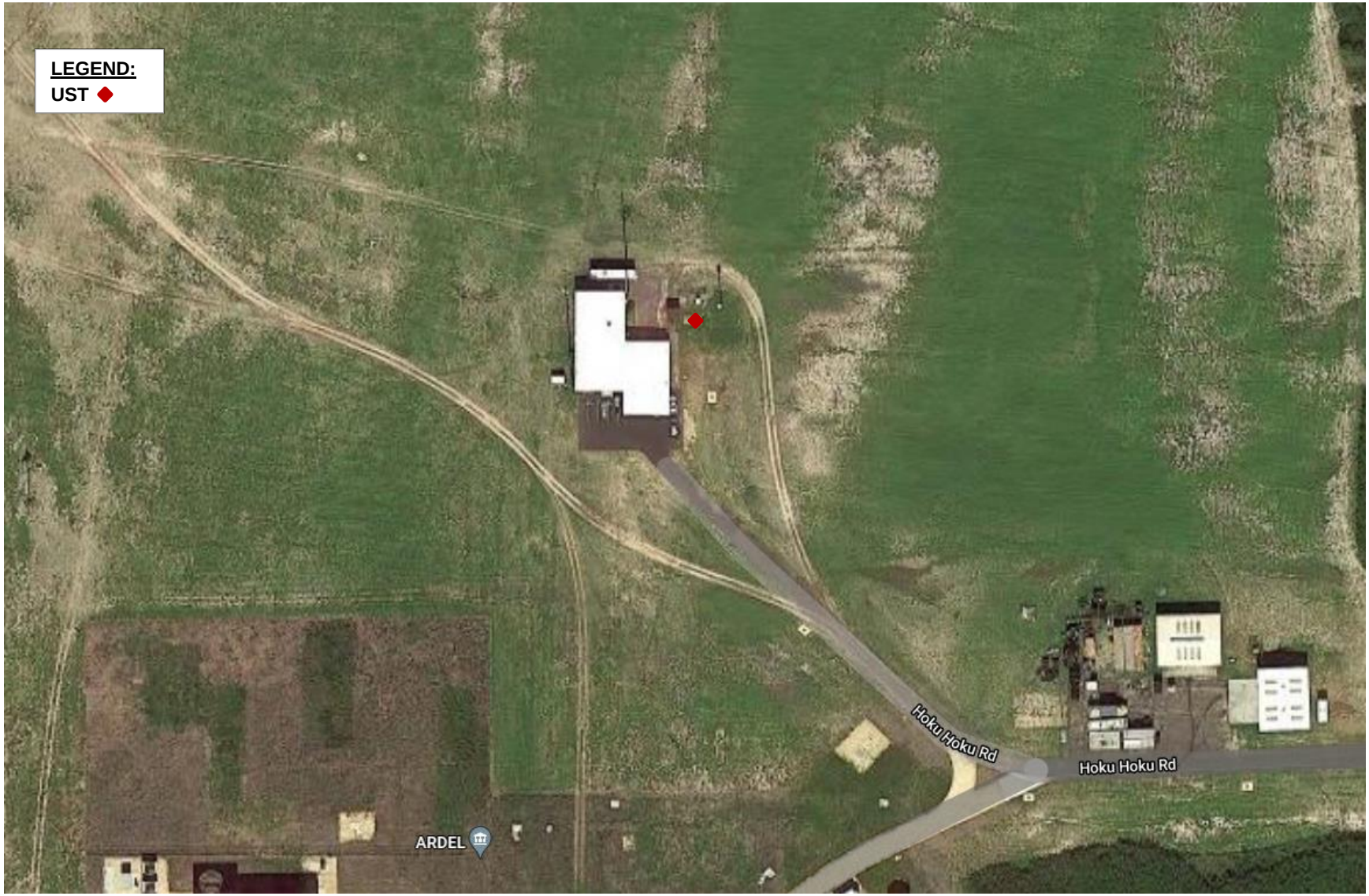


FIGURE K-3: NEX GAS STATION, BUILDING 1291

FIGURE K-4: FUEL FARM

Note: Fuel Farm Tanks F-1, F-2, F-3, and F-5 were taken out of service in 2021.

FIGURE K-5: SANDIA NATIONAL LABORATORY, BUILDING 686

This Page Intentionally Left Blank.