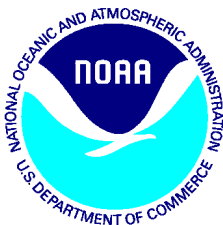
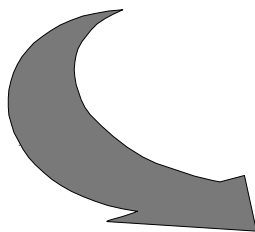
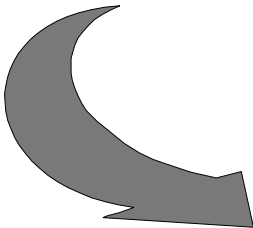


Preassessment Phase

Guidance Document for Natural Resource Damage Assessment Under the Oil Pollution Act of 1990



Damage Assessment
and Restoration Program



August 1996



PREASSESSMENT PHASE

**GUIDANCE DOCUMENT FOR
NATURAL RESOURCES DAMAGE ASSESSMENT
UNDER THE OIL POLLUTION ACT OF 1990**

Prepared for the:

Damage Assessment and Restoration Program
National Oceanic and Atmospheric Administration
1305 East-West Highway, SSMC #4
Silver Spring, Maryland 20910

Prepared by:

Eli Reinharz
Damage Assessment Center
National Oceanic and Atmospheric Administration
1305 East-West Highway, SSMC #4
Silver Spring, Maryland 20910

and

Jacqueline Michel
Research Planning, Inc.
P.O. Box 328
Columbia, South Carolina 29202

August 1996

DISCLAIMER

This guidance document is intended to be used to conduct preliminary Natural Resource Damage Assessment (NRDA) activities under the Oil Pollution Act of 1990 (OPA). This document is not regulatory in nature. Trustees are not required to use this document in order to receive a rebuttable presumption for NRDAs under OPA.

NOAA would appreciate any suggestions on how this document could be made more practical and useful. Readers are encouraged to send comments and recommendations to:

Eli Reinharz
Damage Assessment Center
National Oceanic and Atmospheric Administration
1305 East-West Highway, SSMC #4, N\ORCA\X1
Silver Spring, Maryland 20910
(301) 713-3038 ext 193, phone
(301) 713-4387, fax
ereinharz@spur.nos.noaa.gov, e-mail address

TABLE OF CONTENTS

LIST OF EXHIBITS.....	iv
ACKNOWLEDGMENTS	v
PREFACE	vi
LIST OF ACRONYMS.....	vii
INTRODUCTION.....	CHAPTER 1
1.1 Background.....	1-1
1.2 Purpose and Scope of this Document.....	1-2
1.3 Intended Audience.....	1-2
1.4 The NRDA Process.....	1-2
1.4.1 Preassessment Phase	1-2
1.4.2 Restoration Planning Phase.....	1-2
1.4.2.1 Injury Assessment	1-4
1.4.2.2 Restoration Selection.....	1-4
1.4.3 Restoration Implementation Phase	1-6
1.5 Basic Terms and Definitions	1-6
1.5.1 Baseline	1-7
1.5.2 Exposure	1-8
1.5.3 Incident	1-8
1.5.4 Injury.....	1-8
1.5.5 Natural Resources and Services	1-9
1.5.6 Oil	1-10
1.5.7 Pathway.....	1-10

TABLE OF CONTENTS (continued)

PRE-INCIDENT PLANNING..... CHAPTER 2

2.1 Purpose.....	2-1
2.2 Scope.....	2-1
2.2.1 Identify NRDA Teams	2-1
2.2.2 Establish Trustee Notification System	2-2
2.2.3 Identify Support Services.....	2-2
2.2.4 Identify Natural Resources and Services at Risk.....	2-3
2.2.5 Identify Area and Regional Response Agencies and Officials.....	2-3
2.2.6 Identify Available Baseline and Other Relevant Information	2-4
2.2.7 Establish Data Management Systems	2-4
2.2.8 Identify Assessment Funding Procedures and Options.....	2-5

OVERVIEW OF THE PREASSESSMENT PHASE CHAPTER 3

3.1 Purpose.....	3-1
3.2 Preassessment Phase Process.....	3-1
3.2.1 Notification	3-1
3.2.2 Determination of Jurisdiction	3-3
3.2.3 Determination to Conduct Restoration Planning.....	3-5
3.2.3.1 Identifying Natural Resources and Services at Risk	3-5
3.2.3.2 Effectiveness of Response Actions in Addressing Injury	3-6
3.2.3.3 Early Identification of Potential Restoration Actions	3-7
3.2.4 Notice of Intent To Conduct Restoration Planning.....	3-9
3.3 Other Components of the Preassessment Phase.....	3-10
3.3.1 Data Collection and Analysis	3-10
3.3.1.1 Purpose.....	3-10
3.3.1.2 Type of Data Collection and Analysis.....	3-10
3.3.1.3 Standards for NRDA Procedures	3-11
3.3.1.4 Available Assessment Procedures	3-11
3.3.2 Administrative Record	3-12
3.3.3 Coordination.....	3-13
3.3.3.1 Coordination among Trustees	3-13
3.3.3.2 Coordination with Response Agencies.....	3-13
3.3.3.3 Coordination with Responsible Parties	3-14
3.3.3.4 Coordination with the Public.....	3-15
3.4 Emergency Restoration	3-16
3.5 Preassessment Phase Costs	3-17

TABLE OF CONTENTS (continued)

REFERENCES.....	R-1
-----------------	-----

APPENDICES

Appendix A	OPA Regulations	A-i
Appendix B	Related Guidance Documents	B
Appendix C	Glossary of Terms.....	C-1
Appendix D	Examples of Co-Trustee and Trustee-RP Agreements.....	D-i
Appendix E	Guidelines for Preassessment Data Collection and Analysis	E-i
Appendix F	Emergency Field Kits for NRDA.....	F-i
Appendix G	Type of Preassessment Information Available.....	G-i
Appendix H	Quality Assurance.....	H-i
Appendix I	Establishing an Administrative Record.....	I-i
Appendix J	Coordination.....	J-i
Appendix K	Invitation for the RP to Participate in the NRDA: Model Example	K-1

LIST OF EXHIBITS

Exhibit 1.1	NRDA process under the OPA regulations	1-3
Exhibit 3.1	Preassessment Phase Decisionmaking Framework.....	3-2
Exhibit E.1	Checklist of preassessment activities for NRDA trustees	E-7
Exhibit E.2	Shoreline oil terminology/codes.....	E-10
Exhibit E.3	Sample requirements for discharges of oil.....	E-14
Exhibit E.4	Freshwater, and marine and estuarine toxicity tests.....	E-17

ACKNOWLEDGMENTS

There are many reviewers who provided insightful comments and suggestions in the development of this document. Although it is impossible to list all these individuals, some individuals who contributed substantive material and direction deserve special acknowledgment, and are listed below.

Peter Albers	NBS, Patuxent Wildlife Research Center, Stickel Laboratory
Pamela Bergman	DOI, Regional Environmental Office, NW
Linda Burlington	NOAA, Office of General Counsel Natural Resources, Headquarters
David Chapman	NOAA, Damage Assessment Center
Deborah French	Applied Science Associates, Inc.
Doug Helton	NOAA, Damage Assessment Center
Carol Jones	NOAA, Damage Assessment Center
John Kern	NOAA, Damage Assessment Center, Southeast Regional Office
Pat Primi	New York, Environmental Protection Bureau
Cheryl Scannell	NOAA, Office of General Counsel, Southeast Regional Office
Debra Scholtz	Research Planning, Inc.
Robert Stuart	EVS Consultants, Inc.

PREFACE

Oil spill incidents have the potential to cause significant environmental injuries to a wide range of natural resources and services. The extent of injuries resulting from an incident depends upon such factors as the circumstances of the incident and the prevailing environmental conditions. Preventing the discharge of oil, or a threat of such a discharge, is the most logical means of avoiding problems associated with oil spills. However, when oil spill incidents cannot be prevented, measures must be in place to address effects resulting from the incident.

The Oil Pollution Act of 1990 (OPA) was established to provide such measures. OPA highlights the initial response activities needed to contain and clean-up oil, and protect natural resources and services from the imminent effects of oil. OPA also authorizes Natural Resource Damage Assessments (NRDA) to address residual injuries resulting from the incident. NRDA regulations promulgated by the National Oceanic and Atmospheric Administration (NOAA) became effective February 5, 1996 (15 CFR Part 990).

This document focuses on the early or preliminary activities for NRDA's under OPA, as outlined in the Preassessment Phase of the NRDA regulations developed by NOAA. The information gained through preassessment activities should serve as the foundation for a more detailed assessment of injuries to natural resources and services affected by oil spill incidents.

LIST OF ACRONYMS

ACP	Area Contingency Plan
APC	Area Planning Committee
APHA	American Public Health Association
ASTM	American Society for Testing and Materials
AQUIRE	AQUatic Toxicity Information REtrieval System
CHRIS	Chemical Hazard Response Information System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
ERT	Emergency Response Team
FUND	Oil Spill Liability Trust Fund
LAT	Lead Administrative Trustee
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAWQA	National Water Quality Assessment Program
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resource Damage Assessment
OPA	Oil Pollution Act of 1990
OSC	On-Scene Coordinator
QA	Quality Assurance
RP	Responsible Party
RRT	Regional Response Team
SSC	Scientific Support Coordinator
TAT	Technical Assistance Team
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological

1.1 Background

A major goal of the Oil Pollution Act of 1990 (OPA)¹ is to make the environment and public whole for injury to or loss of natural resources and services as a result of a discharge or substantial threat of a discharge of oil (referred to as an “incident”). This goal is achieved through returning injured natural resources and services to the condition they would have been in if the incident had not occurred (otherwise referred to as “baseline” conditions), and compensating for interim losses from the date of the incident until recovery of such natural resources and services through the restoration, rehabilitation, replacement, or acquisition of equivalent natural resources and/or services.

The U.S. Department of Commerce, acting through the National Oceanic and Atmospheric Administration (NOAA), issued final regulations providing an approach that public officials (trustees) may use when conducting Natural Resource Damage Assessments (NRDA) under OPA.² These NRDA regulations (the OPA regulations) describe a process by which trustees may:

- Identify injuries to natural resources and services resulting from an incident;
- Provide for the return of injured natural resources and services to baseline conditions and compensation for interim lost services; and
- Encourage and facilitate public involvement in the restoration process.

The OPA regulations are included in Appendix A of this document for reference. The preamble discussion of the OPA regulations, along with a summary of and response to public comments received on the proposed regulations, is published at 61 Fed. Reg. 440 (January 5, 1996).

¹ 33 U.S.C. §§ 2701 *et seq.*

² The OPA regulations are codified at 15 CFR part 990 and became effective February 5, 1996.

1.2 Purpose and Scope of this Document

The purpose of the Preassessment Phase Guidance Document is to provide trustees with general guidance for early assessment activities required under the Preassessment Phase of the OPA regulations. The Preassessment Phase is a preliminary fact-finding exercise that provides the information necessary to determine whether to pursue restoration planning. Refer to Appendix B for a listing of other related guidance documents in support of the OPA regulations.

1.3 Intended Audience

This document was prepared primarily to provide guidance to natural resource trustees using the OPA regulations. However, other interested persons may also find the information contained in this document useful and are encouraged to use this information as appropriate.

1.4 The NRDA Process

The NRDA process shown in Exhibit 1.1 in the OPA regulations includes three phases outlined below: Preassessment; Restoration Planning; and Restoration Implementation.

1.4.1 Preassessment Phase

The purpose of the Preassessment Phase is to determine if trustees have the jurisdiction to pursue restoration under OPA, and, if so, whether it is appropriate to do so. This preliminary phase begins when the trustees are notified of the incident by response agencies or other persons.

Once notified of an incident, trustees must first determine the threshold criteria that provide their authority to initiate the NRDA process, such as applicability of OPA and potential for injury to natural resources under their trusteeship. Based on early available information, trustees make a preliminary determination whether natural resources or services have been injured. Through coordination with response agencies, trustees next determine whether response actions will eliminate the threat of ongoing injury. If injuries are expected to continue, and feasible restoration alternatives exist to address such injuries, trustees may proceed with the NRDA process.

1.4.2 Restoration Planning Phase

The purpose of the Restoration Planning Phase is to evaluate potential injuries to natural resources and services and use that information to determine the need for and scale of restoration actions. The Restoration Planning Phase provides the link between injury and restoration. The Restoration Planning Phase has two basic components: injury assessment and restoration selection.

NATURAL RESOURCE DAMAGE ASSESSMENT
Oil Pollution Act of 1990
Overview of Process

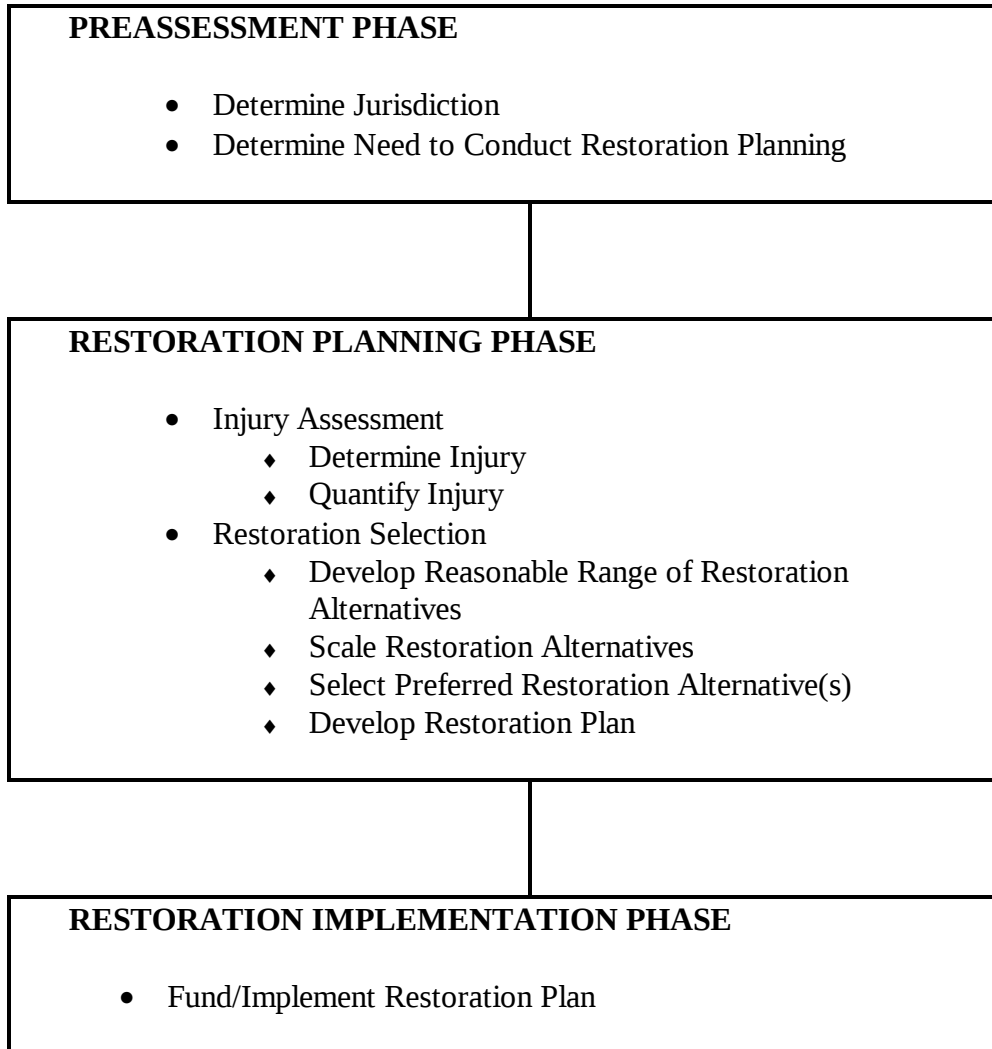


Exhibit 1.1 NRDA process under the OPA regulations.

1.4.2.1 Injury Assessment

The goal of injury assessment is to determine the nature, degree, and extent of any injuries to natural resources and services. This information is necessary to provide a technical basis for evaluating the need for, type of, and scale of restoration actions. Under the OPA regulations, injury is defined as an observable or measurable adverse change in a natural resource or impairment of a natural resource service. Trustees determine whether there is:

- Exposure, a pathway, and an adverse change to a natural resource or service as a result of an actual discharge; or
- An injury to a natural resource or impairment of a natural resource service as a result of response actions or a substantial threat of a discharge.

To proceed with restoration planning, trustees also quantify the degree, and spatial and temporal extent of injuries. Injuries are quantified by comparing the condition of the injured natural resources or services to baseline, as necessary.

1.4.2.2 Restoration Selection

(a) Developing Restoration Alternatives

Once injury assessment is complete or nearly complete, trustees develop a plan for restoring the injured natural resources and services. Under the OPA regulations, trustees must identify a reasonable range of restoration alternatives, evaluate and select the preferred alternative(s), and develop a Draft and Final Restoration Plan. Acceptable restoration actions include any of the actions authorized under OPA (restoration, rehabilitation, replacement, or acquisition of the equivalent) or some combination of those actions

Restoration actions under the OPA regulations are either primary or compensatory. Primary restoration is action taken to return injured natural resources and services to baseline, including natural recovery. Compensatory restoration is action taken to compensate for the interim losses of natural resources and/or services pending recovery. Each restoration alternative considered will contain primary and/or compensatory restoration actions that address one or more specific injuries associated with the incident. The type and scale of compensatory restoration may depend on the nature of the primary restoration action, and the level and rate of recovery of the injured natural resources and/or services given the primary restoration action.

When identifying the compensatory restoration components of the restoration alternatives, trustees must first consider compensatory restoration actions that provide services of the same type and quality, and of comparable value as those lost. If compensatory actions of the same type and quality and comparable value cannot provide a reasonable range of alternatives, trustees then consider other compensatory restoration actions that will provide services of at least comparable type and quality as those lost.

(b) Scaling Restoration Actions

To ensure that a restoration action appropriately addresses the injuries resulting from an incident, trustees must determine what scale of restoration is required to return injured natural resources to baseline levels and compensate for interim losses. The approaches that may be used to determine the appropriate scale of a restoration action are the resource-to-resource (or service-to-service approach) and the valuation approach. Under the resource-to-resource or service-to-service approach to scaling, trustees determine the appropriate quantity of replacement natural resources and/or services to compensate for the amount of injured natural resources or services.

Where trustees must consider actions that provide natural resources and/or services that are of a different type, quality, or value than the injured natural resources and/or services, or where resource-to-resource (or service-to-service) scaling is inappropriate, trustees may use the valuation approach to scaling, in which the value of services to be returned is compared to the value of services lost. Responsible parties (RPs) are liable for the cost of implementing the restoration action that would generate the equivalent value, not for the calculated interim loss in value. An exception to this principle occurs when valuation of the lost services is practicable, but valuation of the replacement natural resources and/or services cannot be performed within a reasonable time frame or at a reasonable cost. In this case, trustees may estimate the dollar value of the lost services and select the scale of the restoration action that has the cost equivalent to the lost value.

(c) Selecting a Preferred Restoration Alternative

The identified restoration alternatives are evaluated based on a number of factors that include:

- Cost to carry out the alternative;
- Extent to which each alternative is expected to meet the trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses;
- Likelihood of success of each alternative;

- Extent to which each alternative will prevent future injury as a result of the incident, and avoid collateral injury as a result of implementing the alternative;
- Extent to which each alternative benefits more than one natural resource and/or service; and
- Effect of each alternative on public health and safety.

Trustees must select the most cost-effective of two or more equally preferable alternatives.

(d) Developing a Restoration Plan

A Draft Restoration Plan will be made available for review and comment by the public, including, where possible, appropriate members of the scientific community. The Draft Restoration Plan will describe the trustees' preassessment activities, as well as injury assessment activities and results, evaluate restoration alternatives, and identify the preferred restoration alternative(s). After reviewing public comments on the Draft Restoration Plan, trustees develop a Final Restoration Plan. The Final Restoration Plan will become the basis of a claim for damages.

1.4.3 Restoration Implementation Phase

The Final Restoration Plan is presented to the RPs to implement or fund the trustees' costs of implementing the Plan, therefore providing the opportunity for settlement of the damage claim without litigation. Should the RPs decide to decline to settle the claim, OPA authorizes trustees to bring a civil action for damages in federal court or to seek an appropriation from the Oil Spill Liability Trust Fund (FUND) for such damages.

1.5 Basic Terms and Definitions

Legal and regulatory language often differ from conventional usage. This section defines and describes a number of important terms used in this document and in the OPA regulations. Trustees should also refer to the OPA regulatory language of Appendix A (at § 990.30), and Appendix C for additional, related definitions.

1.5.1 Baseline

“*Baseline* means the condition of the natural resources and services that would have existed had the incident not occurred. Baseline data may be estimated using historical data, reference data, control data, or data on incremental changes (e.g., number of dead animals), alone or in combination, as appropriate.” (OPA regulations at § 990.30)

Baseline refers to the condition of natural resources and services that would have existed had the incident not occurred. Although injury quantification requires comparison to a baseline condition, site-specific baseline information that accounts for natural variability and confounding factors prior to the incident may not be required. In many cases, injuries can be quantified in terms of incremental changes resulting from the incident, rather than in terms of absolute changes relative to a known baseline. In this context, site-specific baseline information is not necessary to quantify injury. For example, counts of oiled bird carcasses can be used as a basis for quantifying incremental bird mortality resulting from an incident, thereby providing the basis for planning restoration.

The OPA regulations do not distinguish between baseline, historical, reference, or control data in terms of value and utility in determining the degree and spatial and temporal extent of injuries. These forms of data may serve as a basis of a determination of the conditions of the natural resources and services in the absence of the incident.

Types of information that may be useful in evaluating baseline include:

- Information collected on a regular basis and for a period of time from and prior to the incident;
- Information identifying historical patterns or trends on the area of the incident and injured natural resources and services;
- Information from areas unaffected by the incident, that are judged sufficiently similar to the area of the incident with respect to the parameter being measured; or
- Information from the area of the incident after particular natural resources or services have been judged to have recovered.

1.5.2 Exposure

“*Exposure* means direct or indirect contact with the discharged oil.” (OPA regulations at § 990.30)

Exposure is broadly defined to include not only direct physical exposure to oil, but also indirect exposure (e.g., injury to an organism as a result of disruption of its food web). However, documenting exposure is a prerequisite to determining injury only in the event of an actual discharge of oil. The term *exposure* does not apply to response-related injuries and injuries resulting from a substantial threat of a discharge of oil.

1.5.3 Incident

“*Incident* means any occurrence or series of occurrences having the same origin, involving one or more vessels, facilities, or any combination thereof, resulting in the discharge or substantial threat of discharge of oil into or upon navigable waters or adjoining shorelines or the Exclusive Economic Zone, as defined in section 1001(14) of OPA (33 U.S.C. 2701(14)).” (OPA regulations at § 990.30)

When a discharge of oil occurs, natural resources and/or services may be injured by the actual discharge of oil, or response activities related to the discharge. When there is a substantial threat of a discharge of oil, natural resources and/or services may also be injured by the threat or response actions related to the threat.

1.5.4 Injury

“*Injury* means an observable or measurable adverse change in a natural resource or impairment of a natural resource service. Injury may occur directly or indirectly to a natural resource and/or service. Injury incorporates the terms “destruction,” “loss,” and “loss of use” as provided in OPA.” (OPA regulations at § 990.30)

Section 1002(b)(2)(A) of OPA authorizes natural resource trustees to assess damages for “injury to, destruction of, loss of, or loss of use of” natural resources. The definition of *injury* incorporates these terms. The definition also includes the injuries resulting from the actual discharge of oil, a substantial threat of a discharge of oil, and/or related response actions.

Injury can include adverse changes in the chemical or physical quality, or viability of a natural resource (i.e., direct, indirect, delayed, or sublethal effects). Potential categories of injuries include adverse changes in:

- Survival, growth, and reproduction;
- Health, physiology and biological condition;
- Behavior;
- Community composition;
- Ecological processes and functions;
- Physical and chemical habitat quality or structure; and
- Services to the public.

Although injury is often thought of in terms of adverse changes in biota, the definition of injury under the OPA regulations is broader. Injuries to non-living natural resources (e.g., oiled sand on a recreational beach), as well as injuries to natural resource services (e.g., lost use associated with a fisheries closure to prevent harvest of tainted fish, even though the fish themselves may not be injured) may be considered.

1.5.5 Natural Resources and Services

“Natural resources means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the Exclusive Economic Zone), any State or local government or Indian tribe, or any foreign government, as defined in section 1001(20) of OPA (33 U.S.C. 2701(20)).” (OPA regulations at § 990.30)

Natural resources provide various services to other natural resources and to humans, and loss of services is included in the definition of injury under the OPA regulations.

“*Services (or natural resource services)* means the functions performed by a natural resource for the benefit of another natural resource and/or the public.” (OPA regulations § 990.30)

Natural resource services may be classified as follows:

- Ecological services - the physical, chemical, or biological functions that one natural resource provides for another. Examples include provision of food, protection from predation, and nesting habitat, among others; and
- Human services - the human uses of natural resources or functions of natural resources that provide value to the public. Examples include fishing, hunting, nature photography, and education, among others.

In considering both natural resources and services, trustees are addressing the physical and biological environment, and the relationship of people with that environment.

1.5.6 Oil

“*Oil* means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. However, the term does not include petroleum, including crude oil or any fraction thereof, that is specifically listed or designated as a hazardous substance under 42 U.S.C. 9601(14)(A) through (F), as defined in section 1001(23) of OPA (33 U.S.C. 2701(23)).” (OPA regulations at § 990.30)

Under the OPA regulations, the definition of “oil” includes petroleum, as well as non-petroleum oils (i.e., fats and oils from animal and vegetable sources). However, in assessing injury resulting from non-petroleum oils, trustees should consider the differences in the physical, chemical, biological, and other properties, and in the environmental effects of such oils on the natural resources of concern.

1.5.7 Pathway

“*Pathway* means any link that connects the incident to a natural resource and/or service, and is associated with an actual discharge of oil.” (OPA regulations at § 990.30)

Pathway is the medium, mechanism, or route by which the incident has resulted in an injury. Pathways may include movement/exposure through the water surface, water column, sediments, soil, groundwater, air, or biota.

Pathway determination may include, but is not limited to, an evaluation of the sequence of events by which the discharged oil was transported from the incident and either:

- Came into direct physical contact with the exposed natural resource (e.g., oil transported from an incident by ocean currents, wind, and wave action directly to shellfish); or
- Caused an indirect injury to a natural resource and/or service (e.g., oil transported from an incident by ocean currents, wind, and wave action cause reduced populations of bait fish, which in turn results in starvation of a fish-eating bird; or, oil transported from an incident by currents, wind, and wave action causes the closure of a fishery to prevent potentially tainted fish from being marketed).

Pathway determination does not require that injured natural resources and/or services be directly exposed to oil. In the example provided above, fish-eating birds are injured as a result of decreases in food availability. However, if an injury is caused by direct exposure to oil, the pathway linking the incident to the injury should be determined.

As with exposure, establishing a pathway is a prerequisite to determining injury, except for response-related injuries and injuries resulting from a substantial threat of a discharge of oil.

2.1 Purpose

Trustees are strongly encouraged to undertake NRDA pre-incident planning.¹ This planning should complement response planning undertaken by Regional Response Teams (RRT) and Area Planning Committees (APC).² NRDA plans should identify the responsibilities of the trustees in the case of an oil spill incident, and should identify how trustees and response personnel will coordinate their activities during the early phase of an incident. Pre-incident plans should also allow for the compilation of information needed by the trustees to begin NRDA activities. Whenever possible, the trustees are encouraged to include RPs in the pre-incident planning process. Pre-incident planning and coordination among the principal parties involved can be major factors in the success of an NRDA.

Useful products in pre-incident planning could include a Memorandum of Understanding (MOU) between trustees and model Memorandum of Agreement (MOA) between trustees and RPs. Trustees are referred to Appendix D for examples of MOUs and MOAs. These agreements foster the cooperation and coordination of the trustees and RPs in the planning and completion of NRDA activities, and application of any natural resource damages recovered for restoration. The agreements should provide a framework for the implementation of a NRDA and associated party responsibilities. Agreements should be prepared during the pre-incident planning process. If there is no agreement in place, one should be prepared soon after the occurrence of an oil spill incident.

2.2 Scope

To the extent practicable, trustees, in conjunction with other willing participants, could undertake pre-incident planning activities, similar to the oil contingency planning activities outlined in § 4202(a) of OPA for Area Planning Committees. The trustees could establish working groups at the regional or local area level to undertake these activities.

2.2.1 Identify NRDA Teams

The NRDA process should ensure an interdisciplinary approach for the integrated use of science, economics, and law necessary in planning and implementing restoration. Trustees are encouraged to identify appropriately experienced personnel needed for natural resource assessment teams at the area and regional levels.

¹ OPA regulations at § 990.15.

² Refer to the National Contingency Plan at 40 CFR part 300 at § 300.615.

The make-up of natural resource assessment teams should be appropriate to the scope and scale of the incident and natural resources and/or services injured. For instance, for incidents with complicated or long-term ecological injuries, the core team could include a trustee agency coordinator, natural resource biologist, environmental (petroleum) chemist, natural resource economist, restoration expert, administrative specialist, quality assurance (QA) specialist, data manager/sample custodian, statistician, and natural resource attorney. Appendix E includes a discussion of the roles of these team members. It is not always necessary to have a different person for each role, but experience has shown that each role may be a full-time commitment, especially for significant incidents.

If at all possible, the team should not be *ad hoc*. Members of the NRDA team should be knowledgeable about relevant statutes and regulations and be able to establish a working relationship with the various parties likely to be involved in incidents.

2.2.2 Establish Trustee Notification System

Prompt notification is important for efficient and effective initiation of the NRDA process. Response personnel are required under the National Contingency Plan (NCP) to notify trustees whenever natural resources under their jurisdiction or management have been, or are likely to be, injured as a result of an incident.

Therefore, each trustee should establish emergency notification protocols so that the process can be initiated on a 24-hour basis. Notification could be coordinated to minimize the number of calls response personnel must make to the trustees. Notification protocols are also helpful within trustee agencies so that appropriate regional and local personnel can be informed of an incident. Area and Regional Contingency Plans should include contact information for each trustee and clear, unambiguous criteria for trustee notification (e.g., all incidents, incidents over a certain size, location, etc.).

2.2.3 Identify Support Services

In many circumstances, trustees may require specialized contractual support. For example, research vessels may be necessary for sample collection or outside experts may be necessary to design and conduct studies. Delays in beginning assessment can be avoided if trustees can identify in pre-incident planning appropriate support services and pursue contracting procedures that will expedite incident-specific hiring of contractors.

Identified contractors may even be called on to participate in pre-incident planning so that all parties are familiar with the specific needs of the restoration process. Backup services should also be identified since the needs of both response and natural resource activities can exceed even regional capabilities.

2.2.4 Identify Natural Resources and Services at Risk

In the NCP, regional and area planning committees are responsible for the identification of natural resources under their jurisdiction that are potentially vulnerable to incidents for given geographic areas such as wetland habitats near oil terminals or bird rookeries near shipping routes. If there is an incident, the response teams will focus their efforts on protection of these natural resources and/or services considered most vulnerable. Trustees should actively participate in such planning committees to identify natural resources and services at risk. Trustees may want to develop scenarios for the types of natural resources and services that may be affected by an incident, and plan for appropriate NRDA protocols and procedures. Where practicable, data collection and analysis protocols should be similar to those used in baseline studies to ensure comparability with the incident-specific NRDA. Trustees should prepare standard protocols in a format that allows easy customization for a specific incident. Preassessment efforts may be better implemented and generate more useful data for the NRDA as a result of pre-incident planning. Trustees should prepare field kits for collection of samples and measurements in the early or emergency phase of a discharge. Appendix F lists recommended contents of various types of emergency sampling kits.

2.2.5 Identify Area and Regional Response Agencies and Officials

In order to participate actively in area and regional planning activities, trustees should identify the response agencies and officials. Developing a working relationship with these response agencies and officials will optimize coordination between assessment and response activities following an incident.

2.2.6 Identify Available Baseline and other Relevant Information

Trustees should identify and catalog sources of baseline information as part of pre-incident planning, including seeking input on sources of information. Types of information that may be important include:

- Petroleum hydrocarbon contamination in indicator organisms;³
- Species census and inventory data;
- Baseline data on species populations;
- Recreational use statistics; and
- Restoration measures applicable to natural resources and services.

Familiarity with the types of baseline information and identification of data gaps and needs should result in better study designs and restoration approaches.

2.2.7 Establish Data Management Systems

Data management and record keeping are critical throughout an NRDA. Data management systems designed during pre-incident planning may minimize the loss of critical information during an incident. For small incidents, this may be a relatively simple filing system, but for large incidents, a centralized computer-based system may be more appropriate.

³ For baseline information on petroleum hydrocarbons, useful sources include the: State Mussel Watch programs; NOAA's National Status & Trends Program (NS&T); U.S. Fish & Wildlife Service's (USFWS) Biological and Environmental Status & Trends Program (BEST); U.S. Environmental Protection Agency's (USEPA) Environmental Monitoring & Assessment Program (EMAP); and U.S. Geological Survey's (USGS) National Water Quality Assessment Program (NAWQA).

Trustees may decide to develop consistent data management formats, such as field, laboratory and QA forms, to facilitate data management. Data management should address the:

- Type and volume of data;
- Uses and users of the data;
- Availability of existing data management structures;
- QA and chain-of-custody requirements;
- Reporting requirements; and
- Accessibility of the data.

Data management should also include provisions for distribution of updates for the trustees and others on a timely basis. Guidance on developing and applying effective data management systems can be found in Michener et al. (1985), Michener (1986), and USEPA (1990).

2.2.8 Identify Assessment Funding Procedures and Options

Funding of trustee activities should be addressed during pre-incident planning because of the need to initiate actions expeditiously after an incident. Trustees may have several sources of potential funding, including:

- RPs;
- Oil Spill Liability Trust Fund (Fund) for initiating activities; and
- Agency funding.

Trustees should consult the available guidance from the U.S. Coast Guard (USCG) for access to the Fund (U.S. Coast Guard, 1995), and incorporate these procedures into pre-incident planning.

3.1 Purpose

During the Preassessment Phase, trustees make critical determinations that shape the remainder of the NRDA. Based on the circumstances of a given incident, trustees determine whether NRDA actions under OPA are justified and make preliminary determinations regarding the type of injury assessment and restoration actions that may be pursued.¹ Other matters considered during the Preassessment Phase may include data collection, opening the Administrative Record, coordination, and emergency restoration.

The Preassessment Phase process and its components are described below. An overview of the Preassessment Phase is provided in Exhibit 3-1.

The time period to complete the Preassessment Phase will vary from incident to incident. Although it is difficult to accurately prescribe a time standard to this component of a NRDA, past experience has found that many preassessment activities are completed within six months. Trustees should be prepared to accommodate the conduct of preassessment activities over a longer period of time where necessary.

3.2 Preassessment Phase Process

3.2.1 Notification

An NRDA begins with notification of an incident. According to the NCP, the On-Scene Coordinator (OSC) or lead response agency generally provides notification to the trustees.² After learning of the incident, the trustees should confirm that all the other known potentially affected trustees have been notified.

Trustees should consult with response agencies to determine the conditions for and the manner of notification of incidents. One option is to notify the trustees of every incident. However, each year thousands of oil spill incidents are reported to local response agencies and/or the National Response Center. Between the period 1973 and 1990, approximately 105,000 oil spills were reported and tracked by the USCG (Goodspeed, 1991) through its Marine Pollution Retrieval System, which includes only discharges located in coastal waters and the Great Lakes region. Of these discharges, 74% were less than 50 gallons, and 95% were less than 1,000 gallons.

¹ OPA regulations at § 990.40.

² NCP at § 300.320(a)(5).

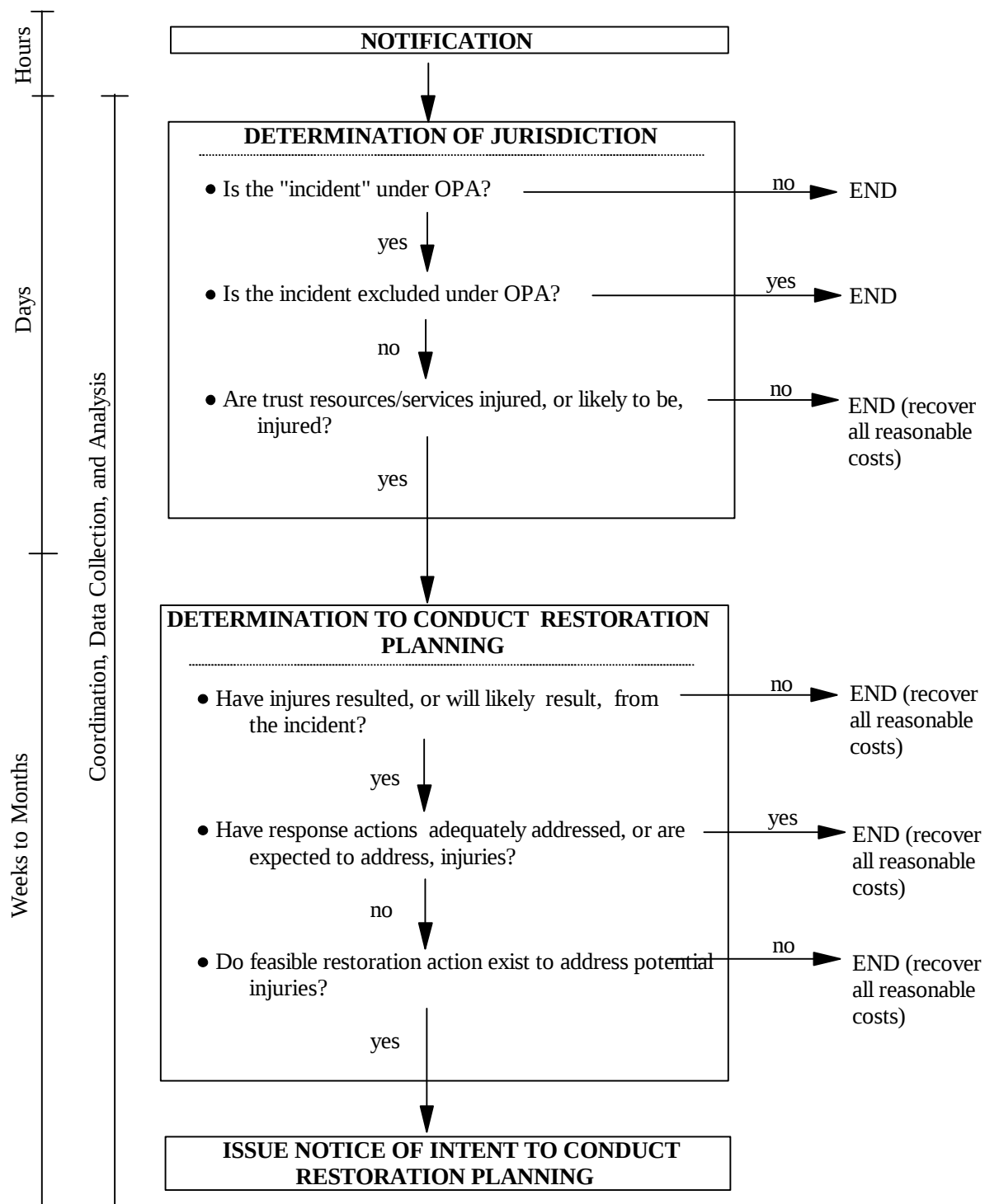


Exhibit 3-1 Preassessment Phase Decisionmaking Framework.

Although there is no fixed relationship between discharge size and likely damages, very small discharges do not routinely result in significant natural resource damages. Therefore, the trustees should establish some criteria for when they require notification of an incident. The most simple criterion is discharge size. As part of pre-incident planning, the trustees should review the histories of incidents in their areas and natural resources and develop notification criteria for response agencies.

At a minimum, trustees should consider including in Area Contingency Plans (ACPs):³

- Updated contact name and phone numbers;
- Criteria for when contacts should be notified;
- Guidance on whether notification should occur on a 24-hour basis or during normal working hours;
- How notification is made during off-hours, if different than above;
- How the other trustees are notified; and
- Backup measures to ensure other trustees are notified.

3.2.2 Determination of Jurisdiction

Before proceeding with an NRDA under OPA, trustees must make certain determinations. Initially, trustees must determine whether they have jurisdiction to proceed under OPA. Three conditions, which are outlined in the OPA regulations,⁴ must be met:

- An incident under OPA has occurred;
- The incident does not fall within exclusionary conditions set forth in § 1002(c) of OPA(33 U.S.C. 2702(c)); and
- Natural resources or services under the trusteeship of the trustee may have been, or are likely to be, injured as a result of the incident.

³ NCP at § 300.210(c).

⁴ OPA regulations at § 990.41(a).

Under the first condition, trustees must determine whether there has been a discharge, or substantial threat of a discharge, of oil. As for the second condition, trustees must determine whether the incident is not: permitted, or exceeds a permit, issued under Federal, State, or local law; from a public vessel; or from an onshore facility subject to the Trans-Alaska Pipeline Authority Act (43 U.S.C. 1651, *et seq.*). Frequently, the first two conditions are determined by the response agency; which should inform the trustees. The USCG, USEPA, or a State response agency may have already made the determination that OPA applies to the incident before notifying trustees.

The third condition is really intended to determine whether any natural resources under the stewardship of the trustees have been or are likely to be *affected* by the incident. This condition is necessarily determined by each trustee agency, based upon readily available information (e.g., maps, database, prior surveys, etc.). However, trustees may need to conduct some preliminary field work to confirm this condition is met.

The determination of jurisdiction may be made within hours. However, this determination should generally not take any longer than one to two days after receipt of adequate information about the incident.

If all of the conditions listed above are met, trustees may proceed with the Preassessment Phase. If any one of the conditions is not met, trustees may not take additional action under the OPA regulations, except action to finalize this jurisdictional determination. Trustees may recover all reasonable preassessment costs incurred up to this point provided that the first two conditions above were met, and actions were taken with the reasonable belief that natural resources or services under their trusteeship might have been affected as a result of the incident.⁵

A determination that OPA applies and that a trustee has jurisdiction to act under OPA may trigger *initiation* of the NRDA. Under such circumstances, trustees may request for preassessment funding using the USCG guidance on initiation funding procedures (U.S. Coast Guard, 1995).

⁵ OPA regulations at § 990.41(b).

3.2.3 Determination to Conduct Restoration Planning

Once jurisdiction has been established, trustees should then determine if restoration actions should be pursued.⁶ This determination depends on the following conditions, which are described below:

- Injuries have resulted, or are likely to result, from the incident;
- Response actions have not adequately addressed, or are not expected to adequately address, the injuries resulting from the incident; and
- Feasible primary and/or compensatory restoration actions exist to address the potential injuries.

3.2.3.1 Identifying Natural Resources and Services at Risk

Determining whether natural resources or services are or are likely to be injured requires that trustees consider the:

- Circumstances of the incident. Factors to consider include the:
 - ◆ location of the incident;
 - ◆ cause of the incident (e.g., collision, grounding, blowout, etc.);
 - ◆ condition of the vessel or facility;
 - ◆ environmental conditions contributing to the incident (e.g., climatic, weather, and water conditions, land-water configuration, etc.); and
 - ◆ status of the incident (e.g., actual or potential discharge, discrete/intermittent/continuous discharge, etc.);

⁶ OPA regulations at § 990.42(a).

- Characteristics of the discharge or substantial threat of the discharge. Factors to consider include:
 - ◆ the type of oil(s) discharged or threatened to be discharged, which may be described by its physical and chemical parameters;
 - ◆ date, time, and duration of the discharge or its threat;
 - ◆ extent of the discharge or its threat (e.g., volume, spatial and temporal boundaries, etc.); and
 - ◆ characteristics of the discharge or its threat that address its transport and fate (e.g., weathering, evaporation rates, dissolution, tendency for formation of emulsions, photo-oxidation rates, biodegradation potential, and toxicity);

- Characteristics of the natural resources. Factors to consider include:
 - ◆ the natural resources in the area of the incident;
 - ◆ the services they provide;
 - ◆ habitat and species types;
 - ◆ seasonal implications on sensitive life stages; and
 - ◆ unique ecological components (e.g., protected habitats, and endangered and threatened species; etc.); and

- Potential for injury. Factors to consider include:
 - ◆ potential for exposure;
 - ◆ pathways;
 - ◆ causal mechanisms; and
 - ◆ availability of assessment procedures and data to analyze these factors.

Trustees should consider injuries resulting from the incident as well as from actions taken to respond to the incident.

3.2.3.2 Effectiveness of Response Actions in Addressing Injury

Once trustees determine that natural resources and/or services have been or may be injured as a result of the incident, trustees should then determine whether these injuries are likely to be adequately addressed through response actions. This analysis should also consider whether restoration is feasible for injuries that occurred at the time of the incident, even if injured natural resources and services are expected to return to baseline as a result of response actions. If response actions are not expected to address residual natural resource and/or service injuries, trustees should determine whether there is a need and potential for restoration actions to address initial or residual injuries, and begin identifying these actions.

3.2.3.3 Early Identification of Potential Restoration Actions

Potential restoration actions need to be identified as early as practicable. Such identification helps to identify the purpose behind a decision to proceed with an NRDA that will lead to effective restoration actions, and provides the focus for designing injury assessment studies that will produce useful information on the type and scale of restoration needed. Trustees should refer to the Restoration Guidance Document listed in Appendix B as a start in identifying potential restoration options.

Considerations for early identification of restoration actions may include:

- Potential nature, degree, and spatial and temporal extent of injury, with or without restoration;
- Need and potential for restoration given the types of injuries;
- Potential type and scale of restoration;
- Extent of known information relevant to determining restoration needs;
- Time, money, and personnel required and available to obtain information relevant to restoration; and
- Requirements imposed by other applicable laws, regulations, and permits that would affect restoration.

The intent in the determination to conduct restoration planning is to define a conceptual model that can establish cause-effect associations between the incident and potential injuries resulting from the incident and define likely restoration alternatives. This effort does not require a formal risk assessment procedure, but should be based on the weight of evidence of data collected, as well as best professional judgment.

The correlation of chemical, toxicity, ecological, and/or biomarker data collected in the field or through the laboratory is the best means of establishing probable cause-effect associations. In the absence of such data or with incomplete data, the potential for injury may be determined relative to established standards or criteria or to scientifically sound thresholds using chemical data alone. It may also be possible to use the results of fate, transport, and effect models to identify possible associations between the discharged oil and potential injury.

Readily available information on the circumstances of an incident and likely natural resources and services at risk may be obtained from the on-scene response agencies. For most large discharges of oil under USCG jurisdiction, the NOAA Scientific Support Coordinator (SSC) will have information on the oil trajectory, short-term fate and behavior of the oil discharged, natural resources and services at risk, and response actions taken to-date. For discharges under USEPA jurisdiction, the Emergency Response Team (ERT) and/or Technical Assistance Team (TAT) can provide similar information. Resource managers who are assisting the OSC or designee in the response can provide on-scene information on the natural resources and services that are present and may be affected. For small incidents, the local resource manager or response representative is often the only official to investigate the incident. The trustees can contact specialists (experts) in oil discharge effects to provide their expertise on the likelihood of injury to natural resources and services, given the circumstances of the incident.

Other sources of information may also be available for additional scientific or technical needs. For instance, there are a number of publicly available computer models that can estimate the distribution and fate of discharged oil, including the Automated Data Inquiry for Oil Spills model, data for which can be provided by the SSC, the oil weathering model developed by Payne et al., 1983, and the Type A models developed under CERCLA. There are also on-line and published databases that may be of value, including the: AQUatic Toxicity Retrieval System (AQUIRE), a database of aquatic toxicity test results for 5,500 individual compounds compiled by the USEPA (Pilli et al., 1989); and several databases available through the Chemical Information System (CIS), such as Chemical Hazard Response Information System (CHRIS, 1984), originally developed by the USCG, and Oil and Hazardous Materials-Technical Assistance Data System originally developed by the USEPA (1981), among others. Finally, there is a range of other information in the literature that may also be useful (e.g., Long and Morgan, 1990).

If the conditions listed above are met (section 3.2.3), trustees may proceed with NRDA actions (i.e., conduct the Restoration Planning Phase, beginning with injury assessment). If the trustees decide to proceed with the NRDA, the trustees must issue a Notice of Intent to Conduct Restoration Planning, which is described below. If any one of the conditions is not met, trustees may not take additional NRDA action under the OPA regulations, except action to finalize this determination. However, trustees may recover all reasonable assessment costs incurred up to this point.⁷

The determination to conduct restoration planning may be issued within weeks or months after the incident. Trustees should seek to efficiently and effectively expedite the Preassessment Phase in order to avoid delays in restoration planning and the potential loss of ephemeral data on the incident.

⁷ OPA regulations at § 990.42(b).

3.2.4 Notice of Intent To Conduct Restoration Planning

If the trustees determine that there is a reasonable likelihood that injury has occurred as a result of the incident and feasible restoration actions exist that would address that injury, the trustees may proceed with the NRDA. If trustees decide to proceed, they must prepare a Notice of Intent to Conduct Restoration Planning,⁸ which documents the trustees' preassessment activities and the basis for the decision to proceed. Depending on information available at this stage, the notice may also include a description of the trustees' proposed strategy to assess injury and determine the type and scale of restoration. The notice should also indicate the location of and contact for the Administrative Record, which is required to be established concurrently with issuance of the notice (see the discussion in section 3.3.2 and Appendix I).

The contents of the notice may vary, but will typically discuss:⁹

- The facts of the incident (section 3.2.3.1(a-c));
- Trustee authority to proceed with the NRDA (OPA § 1006(c));
- Natural resources and/or services that are, or are likely to be, injured as a result of the incident (section 3.2.3.1(d));
- Potential restoration actions relevant to the expected injuries (section 3.2.3.3); and
- If determined at the time, potential assessment procedures to evaluate the injuries and define the appropriate type and scale of restoration for the injured natural resources and services (sections 3.3.1.3 and 3.3.1.4).

The notice becomes part of the Administrative Record and must be made publicly available.¹⁰ The means by which the notice is made publicly available and whether public comments are solicited on the notice is left to the discretion of the trustees.

Trustees must also provide a copy of the notice to the known RPs and invite their participation in the conduct of restoration planning (as described in section 3.3.3.3).¹¹

⁸ OPA regulations at § 990.44(a).

⁹ OPA regulations at § 990.44(b).

¹⁰ OPA regulations at § 990.44(c).

¹¹ OPA regulations at § 990.44(d).

3.3 Other Components of the Preassessment Phase

3.3.1 Data Collection and Analysis

3.3.1.1 Purpose

Throughout the Preassessment Phase, the trustees may collect data for a range of needs and decisions. Data collection and analysis are driven by the conditions of the incident and information needs of the trustees, rather than a separate step in the process. The purpose of data collection and analysis in the Preassessment Phase is to facilitate the determination of whether natural resources and/or services have been injured by the incident and may require some form of restoration.

3.3.1.2 Type of Data Collection and Analysis

The type of data collection and analysis should be reasonable in light of the characteristics of the incident and the natural resources and/or services potentially affected. Information collected should be relevant to the NRDA process and the injuries and potential restoration actions. Because of time limitations, data collected and analyzed for preassessment decisionmaking should be readily available. Preassessment data collection and analysis should be completed in a timely fashion, otherwise such activities may not address preassessment needs and should be re-evaluated. Information from other sources, such as response agencies, should be used as much as possible to avoid duplication of efforts.

Types of data collection and analysis that may be needed include:

- Data reasonably expected to be necessary to make a determination of jurisdiction, or a determination to conduct restoration planning;
- Ephemeral data (i.e., information that may be lost if not collected immediately); and
- Data needed to design and implement anticipated assessment procedures.¹²

Trustees may refer to Appendices F-G for more details on the types of preassessment information available, citations to useful preliminary effects-related information, and Quality Assurance (QA) procedures.

¹² OPA regulations at § 990.43.

3.3.1.3 Standards for NRDA Procedures

The OPA regulations require that all NRDA procedures (i.e, protocols, methods, etc.), including those indicated for the Preassessment Phase, be tailored to the circumstances of the incident and the information needed to determine appropriate restoration for that incident. Acceptable procedures for an incident must meet certain standards,¹³ including:

- The procedures providing information of use in determining the type and scale of restoration appropriate for a particular injury;
- The additional cost of a more complex procedure being reasonably related to the expected increase in the quantity and/or quality of relevant information provided by the more complex procedure; and
- The procedures being reliable and valid for the particular incident.

3.3.1.4 Available Assessment Procedures

It is difficult to identify in advance specific data collection and analysis procedures because of the unique conditions of each incident and the wide range of types of natural resources and services potentially affected. Therefore, the OPA regulations provide trustees with a range of procedures (from field or laboratory procedures, to model- or literature-based procedures, to a combination thereof).¹⁴ When practicable, preassessment procedures should be chosen that provide information of use in determining the most appropriate alternative for restoring the injury resulting from the incident. In addition, when selecting procedures, trustees should consider factors such as the time and cost to implement the procedure, nature, and spatial and temporal extent of injury and information needed to determine and quantify injury, possible restoration actions for expected injuries, and information needed to determine appropriate restoration. If more than one procedure providing the same type and quality of information is available, the most cost-effective procedure must be used.¹⁵ Further discussion of some of the procedures relevant to the Preassessment Phase is provided in Appendix E.

¹³ OPA regulations at § 990.27(a). Procedures include the Type A models in 43 CFR Part 11, Subpart D, and compensation formulas/schedules.

¹⁴ OPA regulations at § 990.27(b).

¹⁵ OPA regulations at § 990.27(c).

Procedures that may be of use in the Preassessment Phase, as well as other phases of the NRDA, can be found in various sources. Standard procedures (methods) are known for a wide range of chemical and ecological assessment techniques by the American Society for Testing and Materials, USEPA, U.S. Army Corps of Engineers, American Public Health Association, and USFWS (APHA, 1985; ASTM, 1987). For example, the USEPA has developed and validated rapid bioassessment protocols for benthic macroinvertebrates and fish in streams and rivers (Plafkin et al., 1989), an effective screening tool to initially determine and quantify injury. Appendix E includes discussions and references for biological and chemical study methods that may be useful in the Preassessment Phase.

3.3.2 Administrative Record

An Administrative Record facilitates the NRDA process by providing a central repository for materials relied upon by trustees in making final determinations about NRDA actions appropriate for an incident. Therefore, an Administrative Record should be opened after trustees decide to proceed with restoration planning, and concurrently with the development of the Notice of Intent to Conduct Restoration Planning. Trustees should refer to Appendix I for additional guidance on how to establish the Administrative Record.

The Administrative Record should contain adequate information to support review of the trustees' decisionmaking process. Depending upon the nature and extent of the incident, the Administrative Record should include information relied upon during the NRDA. Therefore, the Administrative Record should ordinarily include the Notice of Intent to Conduct Restoration Planning, draft and final restoration plans, and public comments, any relevant data, investigation reports, scientific studies, work plans, QA plans, and literature, and any final, executed written agreements among the participating trustees or with the RPs.¹⁶ Privileged documents and confidential settlement communications should not be placed in the Administrative Record.

Federal trustees should maintain the Administrative Record in a manner consistent with the Administrative Procedure Act (5 U.S.C. 551-59, 701-06).¹⁷ The Administrative Record should be limited to final documents when possible. Where no final document is available at the time of selection of restoration actions, draft documents may be included in the Administrative Record if they contain information not found in other documents in the record, but which is considered by the trustees in selecting a restoration action. Pre-decisional, deliberative internal agency memoranda should be treated as draft documents (and be excluded from the Administrative Record) unless relied upon in choosing restoration actions.

¹⁶ OPA regulations at § 990.45(a).

¹⁷ OPA regulations at § 990.45(b).

3.3.3 Coordination

Coordination among all persons involved by an incident is crucial to an efficient and effective NRDA. Coordination, in pre-incident planning and throughout the NRDA, can reduce time until restoration is implemented and ensure that NRDA costs are reasonable. A discussion of some additional aspects of coordination appears in Appendix J.

3.3.3.1 Coordination among Trustees

Trustees with shared or overlapping trusteeship are encouraged to coordinate their activities early in the Preassessment Phase.¹⁸ Coordination among trustees should avoid duplicative claims for damages, address shared natural resource concerns and result in more effective funding of NRDA work. When conducting joint assessments, trustees should designate a Lead Administrative Trustee (LAT) as soon as practicable after notification of an incident. The LAT should be selected by mutual agreement of the trustees. Depending upon the circumstances of the incident, there may be co-LATs or sequential LATs for different stages of the process. The LAT's responsibilities are mainly administrative, unless the trustees agree otherwise.

Trustees are encouraged to consider using agreements, such as MOUs (Appendix D), to structure NRDA activities. Trustees may act independently when there is a reasonable basis for dividing NRDA responsibilities, so long as there is no double recovery of damages. However, independent NRDA's may be less likely to achieve prompt restoration of injured natural resources and services.

3.3.3.2 Coordination with Response Agencies

It is probable that some Preassessment Phase activities may be conducted simultaneously with response activities. Under the OPA regulations, trustees must coordinate their activities with concurrent response agency operations.¹⁹ Any NRDA activities conducted in the area of the incident should be conducted consistent with the NCP, 40 CFR part 300, and any pre-incident plans or MOUs. Coordination among trustees and response agencies can result in reducing or eliminating natural resource and/or service injuries residual to the cleanup.

Under certain circumstances, trustees may be participating as part of the OSC's response organization as well as being members of the NRDA team. In these situations, trustees are encouraged to enter into an MOU during pre-incident planning that addresses the manner in which each trustee will satisfy the obligations entrusted to both response and NRDA activities.

¹⁸ OPA regulations at § 990.45(a).

¹⁹ OPA regulations at § 990.45(b).

3.3.3.3 Coordination with Responsible Parties

Active and early involvement of the RPs in the Preassessment Phase may eliminate some of the problems trustees have encountered immediately following an incident, such as lack of funding, personnel, and equipment. In addition, a joint trustee-RP NRDA may be more cost-effective and avoid duplicate studies. Therefore, the OPA regulations require the trustees to invite the RPs to participate in the NRDA.²⁰ Refer to Appendix K for an example RP invitation.

Determination of the timing and extent of RP participation is left to the judgment of the trustees on an incident-specific basis. While active RP involvement is the preferred means of conducting NRDAs, it may not be appropriate for trustees to delay NRDA activities while negotiating the terms of RP involvement.

Trustees should extend the invitation to participate to known RPs as soon as practicable, but not later than the delivery of the Notice of Intent to Conduct Restoration Planning. The invitation to participate must be in writing, and a written response by the RPs is required to confirm the desire to participate. Trustees and RPs should consider entering into binding MOA agreements (Appendix D) to facilitate their interactions and resolve any disputes during the NRDA. To maximize cost-effectiveness and cooperation, trustees and RPs should attempt to develop a set of agreed-upon facts concerning the incident and/or NRDA. For example, stipulated facts might concern the types of natural resources and services injured, extent of injury or most appropriate assessment procedures to determine injury and/or restoration needs, and how the results of the procedures used will be interpreted.

The scope of the participation by the RPs is determined by the trustees. For identified RPs, there are a number of factors that may assist trustees in making this determination, including the:

- Willingness of the RPs to participate in the NRDA, and provide funding for NRDA;
- Ability of the RPs to conduct NRDA activities in a technically sound and timely manner, and to be bound by the results of jointly agreed upon studies; and
- Degree of cooperation in response activities, and the actions of the RPs in prior NRDAs.

²⁰ OPA regulations at § 990.45(c).

However, the OPA regulations describe a minimum level of RP participation that consists of notice of trustee determinations and notice and opportunity to comment on documents or plans that significantly affect the nature and extent of the NRDA. Increased levels of participation by RPs may be developed at the mutual agreement of the trustees and RPs; however, final authority to make determinations regarding injury and restoration rests solely with the trustees. Final versions of submissions relating to the NRDA by RPs should be placed in the Administrative Record. Confidential communications between the trustees and RPs should not be included in the Administrative Record. Trustees may end participation by RPs who, during the conduct of the NRDA, interfere with the trustees' ability to fulfill their responsibilities.

Participating RPs may formally request use of assessment procedures other than those that have been selected by trustees as the most appropriate for the incident and injury of concern. RPs must identify specific alternate procedures, and demonstrate that they meet the requirements for acceptable assessment procedures as described above. In addition, because trustees will already have made a determination that a different procedure is appropriate, the RPs must agree not to challenge the results of the requested alternate procedure, and agree to fund the alternate procedure. Trustees may deny the request for alternate procedures on the grounds that they are not technically feasible or scientifically sound, are inconsistent with the standards established for assessment procedures described previously, or could not be completed in a reasonable time frame. Trustees must document the request and their response in the Administrative Record.

Trustees must describe or document in the Administrative Record and Restoration Plan the invitation for participation by the RPs, briefly describe or document the nature and extent of the RPs' participation, and briefly describe or document, if applicable, why the RPs' participation was terminated.

3.3.3.4 Coordination with the Public

A major goal of OPA is to involve the public in the restoration planning process. At a minimum, trustees must provide opportunities for public involvement after the trustees decide to develop a restoration plan. Trustees are encouraged to involve the public in the NRDA at any time earlier (i.e., Preassessment Phase), if such involvement is expected to enhance the trustees' decisionmaking or facilitate the restoration process.²¹

²¹ OPA regulations at § 990.45(d).

Depending upon the nature of the incident and expected NRDA actions, public comment may be solicited at various stages to ensure the best information base is available to the trustees. In highly complex incidents, or those incidents that are expected to involve multi-year efforts, trustees may have an opportunity to set up one or a series of public meetings to ensure opportunity for public input. Attendance should be encouraged by all persons that are involved, participating, or interested in the incident.

To the fullest extent practicable, trustees should involve the public to:

- Encourage a broad understanding of restoration and build trust, thus allowing for quicker recognition and support of the restoration process overall; and
- Incorporate public concern, providing for more effective restoration planning.

3.4 Emergency Restoration

The need for emergency restoration actions may occur while the trustees are conducting preassessment activities.²² Emergency restoration actions should be considered in situations where immediate action is necessary to minimize continuing or prevent additional injury. Although emergency restoration actions may be considered and implemented by trustees at any time throughout the NRDA, typically trustees begin evaluating the need for emergency restoration during the response phase.

If response actions are still underway, trustees, through their RRT member or designee, must coordinate with the OSC before taking any emergency restoration actions.²³ Any emergency restoration actions proposed by trustees should not interfere with on-going response actions. Trustees must explain to response agencies through the OSC prior to implementation of emergency restoration actions their reasons for believing that proposed emergency restoration actions will not interfere with on-going response actions.

Trustees must provide notice to identified RPs of any emergency restoration actions and, to the extent time permits, invite their participation in the conduct of those actions, consistent with the provisions of § 990.14(c) of the OPA regulations (section 3.3.3.3).²⁴

²² OPA regulations at § 990.26(a).

²³ OPA regulations at § 990.26(b).

²⁴ OPA regulations at § 990.26(c).

Although § 1012(j)(2) of OPA excludes emergency restoration actions from the standard public review and comment requirements, trustees must also provide notice to the public, to the extent practicable, of these planned emergency restoration actions.²⁵ Trustees may take emergency restoration actions that are feasible, likely to minimize continuing or prevent additional injury, and can be conducted at a cost that is not unreasonable. Trustees must also notify the public of the justification for, the nature and extent of, and the results of emergency restoration actions within a reasonable time following the actions. The means by which this notice is provided to the public is left to the discretion of the trustees.

Examples of emergency restoration actions trustees may undertake include:

- Placement of shore protection structures along a marsh shoreline where the vegetation was killed to minimize erosion of the shoreline during winter storms; and
- Closure of a fishery or hunting season to speed recovery through higher recruitment rates.

3.5 Preassessment Phase Costs

Trustees may recover the reasonable costs they incur to perform preassessment activities, provided that they have determined that such actions undertaken were premised on the likelihood of injury and the need for restoration.²⁶ Costs that the trustees are entitled to recover for activities conducted during the Preassessment Phase include, but are not limited to, costs associated with:

- Notification;
- Coordination with other trustees, response agencies, the RPs, and the public;
- Determination of jurisdiction;
- Determination to conduct restoration planning;
- Data collection and analysis;

²⁵ OPA regulations at § 990.26(d).

²⁶ OPA regulations at § 990.30.

- Report preparation; and
- Evaluating, planning, and implementing emergency restoration actions.

Categories of costs that are recoverable include:

- Staff time directly involved in the preassessment activities;
- Necessary travel to collect data and attend meetings;
- Expendable supplies used during the conduct of the above activities, such as film, field notebooks, sampling containers, etc.;
- Rental or leasing of aircraft, boats, large sampling gear, and equipment needed to conduct field surveys and sampling;
- Hiring of contractors to assist in data collection, analysis, consultation, and report preparation;
- Costs of laboratory analysis of samples;
- Rental of facilities for on-scene operations of the NRDA team and associated meetings; and
- Preparation and distribution of reports, announcements, public releases, etc.

Care should be taken not to include trustee costs that are related to response actions. It may be difficult under some conditions to draw a sharp line between response and NRDA activities early in the incident. However, trustees need to make this distinction.

Preassessment Phase costs should be fully documented. All personnel should keep detailed records of time and specific activities conducted. Because of the emergency conditions of an incident, normal procurement procedures oftentimes may need to be bypassed, and expenses are incurred. Careful and complete records must be kept. All necessary and reasonable costs incurred during the Preassessment Phase for initiation of the NRDA are eligible for immediate funding from the Oil Spill Liability Trust Fund under § 6002(b) of OPA. If the trustee costs are paid by the Fund, the guidelines published by the USCG (1995) should be followed.

Key components of these guidelines are:

- Expenditure documentation should be compiled on a daily basis. Fully itemize all expenditures, costs, and activities for which the trustees are requesting reimbursement. These daily reports should be completed on the date of activity;
- NRDA initiation activities should be documented as performed as a result of a specific incident. A unique Federal Project Number should be used on all documentation;
- Original forms of documentation is preferred, which should not be retyped even if it is handwritten;
- Key individuals need to be identified who can attest to the accuracy of the information and may be required to testify during cost recovery efforts;
- Trustees are encouraged to use the forms provided by the USCG for initiation expenses, though other formats are allowed;
- The Federal LAT needs to monitor the cumulative costs of initiation to ensure they do not exceed the ceiling provided by the applicable Request and Authorization for Initiation Funding; and
- Within thirty (30) calendar days of completion of the initiation of the NRDA, the Federal LAT needs to consolidate all trustee documentation and submit a request for reimbursement.

REFERENCES

- American Public Health Association (APHA). 1985. Standard methods for the examination of water and wastewater: 16th Edition, Washington, DC, 1,268 pp.
- American Society for Testing and Materials (ASTM). 1987. Annual book of ASTM standards: Water and environmental technology: Vol. 11.04, Philadelphia, PA, 1,103 pp.
- Chemical Hazard Response Information System (CHRIS). 1984. Hazardous chemical data: U.S. Coast Guard, Washington, DC, Volumes I and II.
- Goodspeed, T. 1991. Analysis of U.S. Coast Guard P1125 database: NOAA Strategic Environmental Assessment Division, In-House Report, Silver Spring, MD.
- Long, E.R. and L.G. Morgan. 1990. The potential for biological effects of sediment sorbed contaminants tested in the National Status and Trends Program: NOAA Technical Memorandum NOS OMA 52, Seattle, WA, 175 pp. plus appendices.
- Michener, W.K., R.J. Feller, and D.G. Edwards. 1985. Development, management, and analysis of a long-term ecological research information base: Example for marine macrobenthos: New Approaches to Monitoring Aquatic Ecosystems, ASTM Special Technical Publ. 940, Philadelphia, PA.
- Michener, W.K. (Ed.). 1986. Research data management in the ecological sciences: The Belle W. Baruch Library in Marine Science, Number 16, University of South Carolina Press, Columbia, SC. National Academy of Science, 1985, Oil in the sea: Inputs, fates, and effects: National Academy Press, Washington, DC, 601 pp.
- Pilli, A., D.O. Carle, and B.R. Sheedy. 1989. AQUIRE: AQUatic toxicity Information RETrieval data base, Technical support documentation: U.S. Environmental Protection Agency, Environmental Research Laboratory, Duluth, MN, 8 pp.
- Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M. Hughes. 1989. Rapid bioassessment protocols for use in streams and rivers: Benthic macroinvertebrates and fish: EPA/444/4-89-001, Office of Water, U.S. Environmental Protection Agency, Washington, DC.
- U.S. Coast Guard. 1995. Guidelines for natural resource trustees: National Pollution Fund Center, Washington, DC.

- U.S. Environmental Protection Agency. 1981. Oil and hazardous materials-Technical assistance data system-Use of "OHM-TADS" data system: U.S. Environmental Protection Agency, Office of Waters Program Operations, Washington, DC.
- U.S. Environmental Protection Agency. 1990. Demonstration project, Data management system for near coastal demonstration project-Volume I: Office of Research and Development, EPA 600/X-90-207, Environmental Monitoring and Assessment Program, Washington, DC.

Table of Contents

Subpart A—Introduction A-1

Sec.

990.10 Purpose A-1

990.11 Scope A-1

990.12 Overview A-1

990.13 Rebuttable presumption. A-2

990.14 Coordination. A-2

990.15 Considerations to facilitate restoration. A-4

Subpart B—Authorities A-5

Sec.

990.20 Relationship to the CERCLA natural resource damage assessment regulations. A-5

990.21 Relationship to the NCP A-5

990.22 Prohibition on double recovery A-5

990.23 Compliance with NEPA and the CEQ regulations A-6

990.24 Compliance with other applicable laws and regulations A-8

990.25 Settlement A-8

990.26 Emergency restoration A-8

990.27 Use of assessment procedures. A-9

Subpart C—Definitions A-10

Sec.

990.30 Definitions A-10

Table of Contents (continued)

Subpart D—Preassessment Phase A-14

Sec.

990.40 Purpose	A-14
990.41 Determination of jurisdiction.....	A-14
990.42 Determination to conduct restoration planning.....	A-14
990.43 Data collection	A-15
990.44 Notice of Intent to Conduct Restoration Planning	A-15
990.45 Administrative record	A-16

Subpart E—Restoration Planning Phase A-17

Sec.

990.50 Purpose	A-17
990.51 Injury assessment-injury determination.....	A-17
990.52 Injury assessment-quantification.....	A-18
990.53 Restoration selection—developing restoration alternatives	A-18
990.54 Restoration selection-evaluation of alternatives	A-20
990.55 Restoration selection-developing restoration plans	A-21
990.56 Restoration selection-use of a Regional Restoration Plan or existing restoration project	A-22

Subpart F—Restoration Implementation Phase A-24

Sec.

990.60 Purpose	A-24
990.61 Administrative record.	A-24
990.62 Presenting a demand	A-24
990.63 Discounting and compounding.....	A-25
990.64 Unsatisfied demands	A-26
990.65 Opening an account for recovered damages	A-26
990.66 Additional considerations.....	A-27

Subpart A—Introduction

§ 990.10 Purpose.

The goal of the Oil Pollution Act of 1990 (OPA), 33 U.S.C. 2701 *et seq.*, is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving a discharge or substantial threat of a discharge of oil (incident). This goal is achieved through the return of the injured natural resources and services to baseline and compensation for interim losses of such natural resources and services from the date of the incident until recovery. The purpose of this part is to promote expeditious and cost-effective restoration of natural resources and services injured as a result of an incident. To fulfill this purpose, this part provides a natural resource damage assessment process for developing a plan for restoration of the injured natural resources and services and pursuing implementation or funding of the plan by responsible parties. This part also provides an administrative process for involving interested parties in the assessment, a range of assessment procedures for identifying and evaluating injuries to natural resources and services, and a means for selecting restoration actions from a reasonable range of alternatives.

§ 990.11 Scope.

The Oil Pollution Act of 1990 (OPA), 33 U.S.C. 2701 *et seq.*, provides for the designation of Federal, state, and, if designated by the Governor of the state, local officials to act on behalf of the public as trustees for natural resources and for the designation of Indian tribe and foreign officials to act as trustees for natural resources on behalf of, respectively, the tribe or its members and the foreign government. This part may be used by these officials in conducting natural resource damage assessments when natural resources and/or services are injured as a result of an incident involving an actual or substantial threat of a discharge of oil. This part is not intended to affect the recoverability of natural resource damages when recoveries are sought other than in accordance with this part.

§ 990.12 Overview.

This part describes three phases of a natural resource damage assessment. The Preassessment Phase, during which trustees determine whether to pursue restoration, is described in subpart D of this part. The Restoration Planning Phase, during which trustees evaluate information on potential injuries and use that information to determine the need for, type of, and scale of restoration, is described in subpart E of this part. The Restoration Implementation Phase, during which trustees ensure implementation of restoration, is described in subpart F of this part.

§ 990.13 Rebuttable presumption.

Any determination or assessment of damages to natural resources made by a Federal, State, or Indian trustee in accordance with this part shall have the force and effect of a rebuttable presumption on behalf of the trustee in any administrative or judicial proceeding under OPA.

§ 990.14 Coordination.

(a) *Trustees.* (1) If an incident affects the interests of multiple trustees, the trustees should act jointly under this part to ensure that full restoration is achieved without double recovery of damages. For joint assessments, trustees must designate one or more Lead Administrative Trustee(s) to act as coordinators.

(2) If there is a reasonable basis for dividing the natural resource damage assessment, trustees may act independently under this part, so long as there is no double recovery of damages.

(b) *Response agencies.* Trustees must coordinate their activities conducted concurrently with response operations with response agencies consistent with the NCP and any pre-incident plans developed under § 990.15(a) of this part. Trustees may develop pre-incident memoranda of understanding to coordinate their activities with response agencies.

(c) *Responsible parties.* (1) *Invitation.* Trustees must invite the responsible parties to participate in the natural resource damage assessment described in this part. The invitation to participate should be in writing, and a written response by the responsible parties is required to confirm the desire to participate.

(2) *Timing.* The invitation to participate should be extended to known responsible parties as soon as practicable, but not later than the delivery of the “Notice of Intent to Conduct Restoration Planning,” under § 990.44 of this part, to the responsible party.

(3) *Agreements.* Trustees and responsible parties should consider entering into binding agreements to facilitate their interactions and resolve any disputes during the assessment. To maximize cost-effectiveness and cooperation, trustees and responsible parties should attempt to develop a set of agreed-upon facts concerning the incident and/or assessment.

(4) *Nature and extent of participation.* If the responsible parties accept the invitation to participate, the scope of that participation must be determined by the trustees, in light of the considerations in paragraph (c)(5) of this section. At a minimum, participation will include notice of trustee determinations required under this part, and notice and opportunity to comment on documents or plans that significantly affect the nature and extent of the assessment. Increased levels of participation by responsible parties may be developed at the mutual agreement of the trustees and the responsible parties. Trustees will objectively consider all written comments provided by the responsible parties, as well as any other recommendations or proposals that the responsible parties submit in writing to the Lead Administrative Trustee. Submissions by the responsible parties will be included in the administrative record. Final authority to make determinations regarding injury and restoration rest solely with the trustees. Trustees may end participation by responsible parties who, during the conduct of the assessment, in the sole judgment of the trustees, cause interference with the trustees' ability to fulfill their responsibilities under OPA and this part.

(5) *Considerations.* In determining the nature and extent of participation by the responsible parties or their representatives, trustees may consider such factors as:

- (i) Whether the responsible parties have been identified;
 - (ii) The willingness of responsible parties to participate in the assessment;
 - (iii) The willingness of responsible parties to fund assessment activities;
 - (iv) The willingness and ability of responsible parties to conduct assessment activities in a technically sound and timely manner and to be bound by the results of jointly agreed upon studies;
 - (v) The degree of cooperation of the responsible parties in the response to the incident;
- and
- (vi) The actions of the responsible parties in prior assessments.

(6) Request for alternative assessment procedures.

(i) The participating responsible parties may request that trustees use assessment procedures other than those selected by the trustees if the responsible parties:

(A) Identify the proposed procedures to be used that meet the requirements of § 990.27 of this part, and provide reasons supporting the technical adequacy and appropriateness of such procedures for the incident and associated injuries;

(B) Advance to the trustees the trustees' reasonable estimate of the cost of using the proposed procedures; and

(C) Agree not to challenge the results of the proposed procedures. The request from the responsible parties may be made at any time, but no later than, fourteen (14) days of being notified of the trustees' proposed assessment procedures for the incident or the injury.

(ii) Trustees may reject the responsible parties' proposed assessment procedures if, in the sole judgment of the trustees, the proposed assessment procedures:

- (A) Are not technically feasible;
- (B) Are not scientifically or technically sound;
- (C) Would inadequately address the natural resources and services of concern;
- (D) Could not be completed within a reasonable time frame; or
- (E) Do not meet the requirements of § 990.27 of this part.

(7) *Disclosure.* Trustees must document in the administrative record and Restoration Plan the invitation to the responsible parties to participate, and briefly describe the nature and extent of the responsible parties' participation. If the responsible parties' participation is terminated during the assessment, trustees must provide a brief explanation of this decision in the administrative record and Restoration Plan.

(d) *Public.* Trustees must provide opportunities for public involvement after the trustees' decision to develop restoration plans or issuance of any notices to that effect, as provided in § 990.55 of this part. Trustees may also provide opportunities for public involvement at any time prior to this decision if such involvement may enhance trustees' decisionmaking or avoid delays in restoration.

§ 990.15 Considerations to facilitate restoration.

In addition to the procedures provided in subparts D through F of this part, trustees may take other actions to further the goal of expediting restoration of injured natural resources and services, including:

(a) *Pre-incident planning.* Trustees may engage in pre-incident planning activities. Pre-incident plans may identify natural resource damage assessment teams, establish trustee notification systems, identify support services, identify natural resources and services at risk, identify area and regional response agencies and officials, identify available baseline information, establish data management systems, and identify assessment funding issues and options. Potentially responsible parties, as well as all other members of the public interested in and capable of participating in assessments, should be included in pre-incident planning to the fullest extent practicable.

(b) *Regional Restoration Plans.* Where practicable, incident-specific restoration plan development is preferred, however, trustees may develop Regional Restoration Plans. These plans may be used to support a claim under § 990.56 of this part. Regional restoration planning may consist of compiling databases that identify, on a regional or watershed basis, or otherwise as appropriate, existing, planned, or proposed restoration projects that may provide appropriate restoration alternatives for consideration in the context of specific incidents.

Subpart B—Authorities

§ 990.20 Relationship to the CERCLA natural resource damage assessment regulations.

(a) *General.* Regulations for assessing natural resource damages resulting from hazardous substance releases under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. 9601 *et seq.*, and the Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. 1321 *et seq.*, are codified at 43 CFR part 11. The CERCLA regulations originally applied to natural resource damages resulting from oil discharges as well as hazardous substance releases. This part supersedes 43 CFR part 11 with regard to oil discharges covered by OPA.

(b) *Assessments commenced before February 5, 1996.* If trustees commenced a natural resource damage assessment for an oil discharge under 43 CFR part 11 prior to February 5, 1996 they may complete the assessment in compliance with 43 CFR part 11, or they may elect to use this part, and obtain a rebuttable presumption.

(c) *Oil and hazardous substance mixtures.* For natural resource damages resulting from a discharge or release of a mixture of oil and hazardous substances, trustees must use 43 CFR part 11 in order to obtain a rebuttable presumption.

§ 990.21 Relationship to the NCP.

This part provides procedures by which trustees may determine appropriate restoration of injured natural resources and services, where such injuries are not fully addressed by response actions. Response actions and the coordination with damage assessment activities are conducted pursuant to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR part 300.

§ 990.22 Prohibition on double recovery.

When taking actions under this part, trustees are subject to the prohibition on double recovery, as provided in 33 U.S.C. 2706(d)(3) of OPA.

§ 990.23 Compliance with NEPA and the CEQ regulations.

(a) *General.* The National Environmental Policy Act (NEPA), 42 U.S.C. 4321 *et seq.* and Council on Environmental Quality (CEQ) regulations implementing NEPA, 40 CFR chapter V, apply to restoration actions by federal trustees, except where a categorical exclusion or other exception to NEPA applies. Thus, when a federal trustee proposes to take restoration actions under this part, it must integrate this part with NEPA, the CEQ regulations, and NEPA regulations promulgated by that federal trustee agency. Where state NEPA-equivalent laws may apply to state trustees, state trustees must consider the extent to which they must integrate this part with their NEPA-equivalent laws. The requirements and process described in this section relate only to NEPA and federal trustees.

(b) *NEPA requirements for federal trustees.* NEPA becomes applicable when federal trustees propose to take restoration actions, which begins with the development of a Draft Restoration Plan under § 990.55 of this part. Depending upon the circumstances of the incident, federal trustees may need to consider early involvement of the public in restoration planning in order to meet their NEPA compliance requirements.

(c) *NEPA process for federal trustees.* Although the steps in the NEPA process may vary among different federal trustees, the process will generally involve the need to develop restoration plans in the form of an Environmental Assessment or Environmental Impact Statement, depending upon the trustee agency's own NEPA regulations.

(1) *Environmental Assessment.* (i) *Purpose.* The purpose of an Environmental Assessment (EA) is to determine whether a proposed restoration action will have a significant (as defined under NEPA and § 1508.27 of the CEQ regulations) impact on the quality of the human environment, in which case an Environmental Impact Statement (EIS) evaluating the impact is required. In the alternative, where the impact will not be significant, federal trustees must issue a Finding of No Significant Impact (FONSI) as part of the restoration plans developed under this part. If significant impacts to the human environment are anticipated, the determination to proceed with an EIS may be made as a result, or in lieu, of the development of the EA.

(ii) *General steps.* (A) If the trustees decide to pursue an EA, the trustees may issue a Notice of Intent to Prepare a Draft Restoration Plan/EA, or proceed directly to developing a Draft Restoration Plan/EA.

(B) The Draft Restoration Plan/EA must be made available for public review before concluding a FONSI or proceeding with an EIS.

(C) If a FONSI is concluded, the restoration planning process should be no different than under § 990.55 of this part, except that the Draft Restoration Plan/EA will include the FONSI analysis.

(D) The time period for public review on the Draft Restoration Plan/EA must be consistent with the federal trustee agency's NEPA requirements, but should generally be no less than thirty (30) calendar days.

(E) The Final Restoration Plan/EA must consider all public comments on the Draft Restoration Plan/EA and FONSI.

(F) The means by which a federal trustee requests, considers, and responds to public comments on the Draft Restoration Plan/EA and FONSI must also be consistent with the federal agency's NEPA requirements.

(2) *Environmental Impact Statement.* (i) *Purpose.* The purpose of an Environmental Impact Statement (EIS) is to involve the public and facilitate the decisionmaking process in the federal trustees' analysis of alternative approaches to restoring injured natural resources and services, where the impacts of such restoration are expected to have significant impacts on the quality of the human environment.

(ii) *General steps.* (A) If trustees determine that restoration actions are likely to have a significant (as defined under NEPA and § 1508.27 of the CEQ regulations) impact on the environment, they must issue a Notice of Intent to Prepare a Draft Restoration Plan/EIS. The notice must be published in the Federal Register.

(B) The notice must be followed by formal public involvement in the development of the Draft Restoration Plan/EIS.

(C) The Draft Restoration Plan/EIS must be made available for public review for a minimum of forty-five (45) calendar days. The Draft Restoration Plan/EIS, or a notice of its availability, must be published in the Federal Register.

(D) The Final Restoration Plan/EIS must consider all public comments on the Draft Restoration Plan/EIS, and incorporate any changes made to the Draft Restoration Plan/EIS in response to public comments.

(E) The Final Restoration Plan/EIS must be made publicly available for a minimum of thirty (30) calendar days before a decision is made on the federal trustees' proposed restoration actions (Record of Decision). The Final Restoration Plan/EIS, or a notice of its availability, must be published in the Federal Register.

(F) The means by which a federal trustee agency requests, considers, and responds to public comments on the Final Restoration Plan/EIS must also be consistent with the federal agency's NEPA requirements.

(G) After appropriate public review on the Final Restoration Plan/EIS is completed, a Record of Decision (ROD) is issued. The ROD summarizes the trustees' decisionmaking process after consideration of any public comments relative to the proposed restoration actions, identifies all restoration alternatives (including the preferred alternative(s)), and their environmental consequences, and states whether all practicable means to avoid or minimize environmental harm were adopted (e.g., monitoring and corrective actions). The ROD may be incorporated with other decision documents prepared by the trustees. The means by which the ROD is made publicly

(d) *Relationship to Regional Restoration Plans or an existing restoration project* If a available must be consistent with the federal trustee agency's NEPA requirements. (Regional Restoration Plan or existing restoration project is proposed for use, federal trustees may be able to tier their NEPA analysis to an existing EIS, as described in §§ 1502.20 and 1508.28 of the CEQ regulations.

§ 990.24 Compliance with other applicable laws and regulations.

(a) *Worker health and safety.* When taking actions under this part, trustees must comply with applicable worker health and safety considerations specified in the NCP for response actions.

(b) *Natural Resources protection.* When acting under this part, trustees must ensure compliance with any applicable consultation, permitting, or review requirements, including but not limited to: the Endangered Species Act of 1973, 16 U.S.C. 1531 *et seq.*; the Coastal Zone Management Act of 1972, 16 U.S.C. 1451 *et seq.*; the Migratory Bird Treaty Act, 16 U.S.C. 703 *et seq.*; the National Marine Sanctuaries Act, 16 U.S.C. 1431 *et seq.*; the National Historic Preservation Act, 12 U.S.C. 470 *et seq.*; the Marine Mammal Protection Act, 16 U.S.C. 1361 *et seq.*; and the Archaeological Resources Protection Act, 16 U.S.C. 470 *et seq.*

§ 990.25 Settlement.

Trustees may settle claims for natural resource damages under this part at any time, provided that the settlement is adequate in the judgment of the trustees to satisfy the goal of OPA and is fair, reasonable, and in the public interest, with particular consideration of the adequacy of the settlement to restore, replace, rehabilitate, or acquire the equivalent of the injured natural resources and services. Sums recovered in settlement of such claims, other than reimbursement of trustee costs, may only be expended in accordance with a restoration plan, which may be set forth in whole or in part in a consent decree or other settlement agreement, which is made available for public review.

§ 990.26 Emergency restoration.

(a) Trustees may take emergency restoration action before completing the process established under this part, provided that:

- (1) The action is needed to minimize continuing or prevent additional injury;
- (2) The action is feasible and likely to minimize continuing or prevent additional injury;

and

- (3) The costs of the action are not unreasonable.

(b) If response actions are still underway, trustees, through their Regional Response Team member or designee, must coordinate with the On-Scene Coordinator (OSC) before taking any emergency restoration actions. Any emergency restoration actions proposed by trustees should not interfere with on-going response actions. Trustees must explain to response agencies through the OSC prior to implementation of emergency restoration actions their reasons for believing that proposed emergency restoration actions will not interfere with on-going response actions.

(c) Trustees must provide notice to identified responsible parties of any emergency restoration actions and, to the extent time permits, invite their participation in the conduct of those actions as provided in § 990.14(c) of this part.

(d) Trustees must provide notice to the public, to the extent practicable, of these planned emergency restoration actions. Trustees must also provide public notice of the justification for, nature and extent of, and results of emergency restoration actions within a reasonable time frame after completion of such actions. The means by which this notice is provided is left to the discretion of the trustee.

§ 990.27 Use of assessment procedures.

(a) *Standards for assessment procedures.* Any procedures used pursuant to this part must comply with all of the following standards if they are to be in accordance with this part:

(1) The procedure must be capable of providing assessment information of use in determining the type and scale of restoration appropriate for a particular injury;

(2) The additional cost of a more complex procedure must be reasonably related to the expected increase in the quantity and/or quality of relevant information provided by the more complex procedure; and

(3) The procedure must be reliable and valid for the particular incident.

(b) *Assessment procedures available.* (1) The range of assessment procedures available to trustees includes, but is not limited to:

(i) Procedures conducted in the field;

(ii) Procedures conducted in the laboratory;

(iii) Model-based procedures, including type A procedures identified in 43 CFR part 11, subpart D, and compensation formulas/schedules; and

(iv) Literature-based procedures.

(2) Trustees may use the assessment procedures in paragraph (b)(1) of this section alone, or in any combination, provided that the standards in paragraph (a) of this section are met, and there is no double recovery.

(c) *Selecting assessment procedures.* (1) When selecting assessment procedures, trustees must consider, at a minimum:

(i) The range of procedures available under paragraph (b) of this section;

(ii) The time and cost necessary to implement the procedures;

(iii) The potential nature, degree, and spatial and temporal extent of the injury;

(iv) The potential restoration actions for the injury; and

(v) The relevance and adequacy of information generated by the procedures to meet information requirements of restoration planning.

(2) If a range of assessment procedures providing the same type and quality of information is available, the most cost-effective procedure must be used.

Subpart C—Definitions

§ 990.30 Definitions.

For the purpose of this rule, the term:

Baseline means the condition of the natural resources and services that would have existed had the incident not occurred. Baseline data may be estimated using historical data, reference data, control data, or data on incremental changes (e.g., number of dead animals), alone or in combination, as appropriate.

Cost-effective means the least costly activity among two or more activities that provide the same or a comparable level of benefits, in the judgment of the trustees.

CEQ regulations means the Council on Environmental Quality regulations implementing NEPA, 40 CFR chapter V.

Damages means damages specified in section 1002(b) of OPA (33 U.S.C. 1002(b)), and includes the costs of assessing these damages, as defined in section 1001(5) of OPA (33 U.S.C. 2701(5)).

Discharge means any emission (other than natural seepage), Intentional or unintentional, and includes, but is not limited to, spilling, leaking, pumping, pouring, emitting, emptying, or dumping, as defined in section 1001(7) of OPA (33 U.S.C. 2701(7)).

Exclusive Economic Zone means the zone established by Presidential Proclamation 5030 of March 10, 1983 (3 CFR, 1984 Comp., p. 22), including the ocean waters of the areas referred to as “eastern special areas” in Article 3(1) of the Agreement between the United States of America and the Union of Soviet Socialist Republics on the Maritime Boundary, signed June 1, 1990, as defined in section 1001(8) of OPA (33 U.S.C. 2701(8)).

Exposure means direct or indirect contact with the discharged oil.

Facility means any structure, group of structures, equipment, or device (other than a vessel) which is used for one or more of the following purposes: exploring for, drilling for, producing, storing, handling, transferring, processing, or transporting oil. This term includes any motor vehicle, rolling stock, or pipeline used for one or more of these purposes, as defined in section 1001(9) of OPA (33 U.S.C. 2701(9)).

Fund means the *Oil Spill Liability Trust Fund*, established by section 9509 of the Internal Revenue Code of 1986 (26 U.S.C. 9509), as defined in section 1001(11) of OPA (33 U.S.C. 2701(11)).

Incident means any occurrence or series of occurrences having the same origin, involving one or more vessels, facilities, or any combination thereof, resulting in the discharge or substantial threat of discharge of oil into or upon navigable waters or adjoining shorelines or the Exclusive Economic Zone, as defined in section 1001(14) of OPA (33 U.S.C. 2701(14)).

Indian tribe (or tribal) means any Indian tribe, band, nation, or other organized group or community, but not including any Alaska Native regional or village corporation, which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians and has governmental authority over lands belonging to or controlled by the tribe, as defined in section 1001(15) of OPA (33 U.S.C. 2701(15)).

Injury means an observable or measurable adverse change in a natural resource or impairment of a natural resource service. Injury may occur directly or indirectly to a natural resource and/or service. Injury incorporates the terms “destruction,” “loss,” and “loss of use” as provided in OPA.

Lead Administrative Trustee(s) (or LAT) means the trustee(s) who is selected by all participating trustees whose natural resources or services are injured by an incident, for the purpose of coordinating natural resource damage assessment activities. The LAT(s) should also facilitate communication between the OSC and other natural resource trustees regarding their activities during the response phase.

NCP means the National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan) codified at 40 CFR part 300, which addresses the identification, investigation, study, and response to incidents, as defined in section 1001(19) of OPA (33 U.S.C. 2701(19)).

Natural resource damage assessment (or assessment) means the process of collecting and analyzing information to evaluate the nature and extent of injuries resulting from an incident, and determine the restoration actions needed to bring injured natural resources and services back to baseline and make the environment and public whole for interim losses.

Natural resources means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the Exclusive Economic Zone), any state or local government or Indian tribe, or any foreign government, as defined in section 1001(20) of OPA (33 U.S.C. 2701(20)).

Navigable waters means the waters of the United States, including the territorial sea, as defined in section 1001(21) of OPA (33 U.S.C. 2701(21)).

NEPA means the National Environmental Policy Act, 42 U.S.C. 4321 et seq.

Oil means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. However, the term does not include petroleum, including crude oil or any fraction thereof, that is specifically listed or designated as a hazardous substance under 42 U.S.C. 9601(14)(A) through (F), as defined in section 1001(23) of OPA (33 U.S.C. 2701(23)).

On-Scene Coordinator (or OSC) means the official designated by the U.S. Environmental Protection Agency or the U.S. Coast Guard to coordinate and direct response actions under the NCP, or the government official designated by the lead response agency to coordinate and direct response actions under the NCP.

OPA means the Oil Pollution Act of 1990, 33 U.S.C. 2701 et seq.

Pathway means any link that connects the incident to a natural resource and/or service, and is associated with an actual discharge of oil.

Person means an individual, corporation, partnership, association, state, municipality, commission, or political subdivision of a state, or any interstate body, as defined in section 1001(27) of OPA (33 U.S.C. 2701(27)).

Public vessel means a vessel owned or bareboat chartered and operated by the United States, or by a state or political subdivision thereof, or by a foreign nation, except when the vessel is engaged in commerce, as defined in section 1001(29) of OPA (33 U.S.C. 2701(29)).

Reasonable assessment costs means, for assessments conducted under this part, assessment costs that are incurred by trustees in accordance with this part. In cases where assessment costs are incurred but trustees do not pursue restoration, trustees may recover their reasonable assessment costs provided that they have determined that assessment actions undertaken were premised on the likelihood of injury and need for restoration. Reasonable assessment costs also include: administrative, legal, and enforcement costs necessary to carry out this part; monitoring and oversight costs; and costs associated with public participation.

Recovery means the return of injured natural resources and services to baseline.

Response (or *remove* or *removal*) means containment and removal of oil or a hazardous substance from water and shorelines or the taking of other actions as may be necessary to minimize or mitigate damage to the public health or welfare, including, but not limited to, fish, shellfish, wildlife, and public and private property, shorelines, and beaches, as defined in section 1001(30) of OPA (33 U.S.C. 2701(30)).

Responsible party means:

(a) *Vessels*. In the case of a vessel, any person owning, operating, or demise chartering the vessel.

(b) *Onshore facilities*. In the case of an onshore facility (other than a pipeline), any person owning or operating the facility, except a federal agency, state, municipality, commission, or political subdivision of a state, or any interstate body, that as the owner transfers possession and right to use the property to another person by lease, assignment, or permit.

(c) *Offshore facilities*. In the case of an offshore facility (other than a pipeline or a deepwater port licensed under the Deepwater Port Act of 1974 (33 U.S.C. 1501 *et seq.*)), the lessee or permittee of the area in which the facility is located or the holder of a right of use and easement granted under applicable state law or the Outer Continental Shelf Lands Act (43 U.S.C. 1301-1356) for the area in which the facility is located (if the holder is a different person than the lessee or permittee), except a federal agency, state, municipality, commission, or political subdivision of a state, or any interstate body, that as owner transfers possession and right to use the property to another person by lease, assignment, or permit.

(d) *Deepwater ports*. In the case of a deepwater port licensed under the Deepwater Port Act of 1974 (33 U.S.C. 1501-1524), the licensee.

(e) *Pipelines*. In the case of a pipeline, any person owning or operating the pipeline.

(f) *Abandonment*. In the case of an abandoned vessel, onshore facility, deepwater port, pipeline, or offshore facility, the persons who would have been responsible parties immediately prior to the abandonment of the vessel or facility, as defined in section 1001(32) of OPA (33 U.S.C. 2701(32)).

Restoration means any action (or alternative), or combination of actions (or alternatives), to restore, rehabilitate, replace, or acquire the equivalent of injured natural resources and services. Restoration includes:

(a) *Primary restoration*, which is any action, including natural recovery, that returns injured natural resources and services to baseline; and

(b) *Compensatory restoration*, which is any action taken to compensate for interim losses of natural resources and services that occur from the date of the incident until recovery.

Services (or *natural resource services*) means the functions performed by a natural resource for the benefit of another natural resource and/or the public.

Trustees (or *natural resource trustees*) means those officials of the federal and state governments, of Indian tribes, and of foreign governments, designated under 33 U.S.C. 2706(b) of OPA.

United States and State means the several States of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Commonwealth of the Northern Marianas, and any other territory or possession of the United States, as defined in section 1001(36) of OPA (33 U.S.C. 2701(36)).

Value means the maximum amount of goods, services, or money an individual is willing to give up to obtain a specific good or service, or the minimum amount of goods, services, or money an individual is willing to accept to forgo a specific good or service. The total value of a natural resource or service includes the value individuals derive from direct use of the natural resource, for example, swimming, boating, hunting, or birdwatching, as well as the value individuals derive from knowing a natural resource will be available for future generations.

Vessel means every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water, other than a public vessel, as defined in section 1001(37) of OPA (33 U.S.C. 2701(37)).

Subpart D—Preassessment Phase

§ 990.40 Purpose.

The purpose of this subpart is to provide a process by which trustees determine if they have jurisdiction to pursue restoration under OPA and, if so, whether it is appropriate to do so.

§ 990.41 Determination of jurisdiction.

(a) *Determination of jurisdiction.* Upon learning of an incident, trustees must determine whether there is jurisdiction to pursue restoration under OPA. To make this determination, trustees must decide if:

- (1) An incident has occurred, as defined in § 990.30 of this part;
- (2) The incident is not:
 - (i) Permitted under a permit issued under federal, state, or local law; or
 - (ii) From a public vessel; or
 - (iii) From an onshore facility subject to the Trans-Alaska Pipeline Authority Act, 43 U.S.C. 1651, *et seq.*; and
- (3) Natural resources under the trusteeship of the trustee may have been, or may be, injured as a result of the incident.

(b) *Proceeding with preassessment.* If the conditions listed in paragraph (a) of this section are met, trustees may proceed under this part. If one of the conditions is not met, trustees may not take additional action under this part, except action to finalize this determination. Trustees may recover all reasonable assessment costs incurred up to this point provided that conditions in paragraphs (a)(1) and (a)(2) of this section were met and actions were taken with the reasonable belief that natural resources or services under their trusteeship might have been injured as a result of the incident.

§ 990.42 Determination to conduct restoration planning.

(a) *Determination on restoration planning.* If trustees determine that there is jurisdiction to pursue restoration under OPA, trustees must determine whether:

- (1) Injuries have resulted, or are likely to result, from the incident;
- (2) Response actions have not adequately addressed, or are not expected to address, the injuries resulting from the incident; and
- (3) Feasible primary and/or compensatory restoration actions exist to address the potential injuries.

(b) *Proceeding with preassessment.* If the conditions listed in paragraph (a) of this section are met, trustees may proceed under § 990.44 of this part. If one of these conditions is not met, trustees may not take additional action under this part, except action to finalize this determination. However, trustees may recover all reasonable assessment costs incurred up to this point.

§ 990.43 Data collection.

Trustees may conduct data collection and analyses that are reasonably related to Preassessment Phase activities. Data collection and analysis during the Preassessment Phase must be coordinated with response actions such that collection and analysis does not interfere with response actions. Trustees may collect and analyze the following types of data during the Preassessment Phase:

- (a) Data reasonably expected to be necessary to make a determination of jurisdiction under § 990.41 of this part, or a determination to conduct restoration planning under § 990.42 of this part;
- (b) Ephemeral data; and
- (c) Information needed to design or implement anticipated assessment procedures under subpart E of this part.

§ 990.44 Notice of Intent to Conduct Restoration Planning.

(a) *General.* If trustees determine that all the conditions under § 990.42(a) of this part are met and trustees decide to proceed with the natural resource damage assessment, they must prepare a Notice of Intent to Conduct Restoration Planning.

(b) *Contents of the notice.* The Notice of Intent to Conduct Restoration Planning must include a discussion of the trustees' analyses under §§ 990.41 and 990.42 of this part. Depending on information available at this point, the notice may include the trustees' proposed strategy to assess injury and determine the type and scale of restoration. The contents of a notice may vary, but will typically discuss:

- (1) The facts of the incident;
- (2) Trustee authority to proceed with the assessment;
- (3) Natural resources and services that are, or are likely to be, injured as a result of the incident;
- (4) Potential restoration actions relevant to the expected injuries; and
- (5) If determined at the time, potential assessment procedures to evaluate the injuries and define the appropriate type and scale of restoration for the injured natural resources and services.

(c) *Public availability of the notice.* Trustees must make a copy of the Notice of Intent to Conduct Restoration Planning publicly available. The means by which the notice is made publicly available and whether public comments are solicited on the notice will depend on the nature and extent of the incident and various information requirements, and is left to the discretion of the trustees.

(d) *Delivery of the notice to the responsible parties.* Trustees must send a copy of the notice to the responsible parties, to the extent known, in such a way as will establish the date of receipt, and invite responsible parties' participation in the conduct of restoration planning. Consistent with § 990.14(c) of this part, the determination of the timing, nature, and extent of responsible party participation will be determined by the trustees on an incident-specific basis.

§ 990.45 Administrative record.

(a) If trustees decide to proceed with restoration planning, they must open a publicly available administrative record to document the basis for their decisions pertaining to restoration. The administrative record should be opened concurrently with the publication of the Notice of Intent to Conduct Restoration Planning. Depending on the nature and extent of the incident and assessment, the administrative record should include documents relied upon during the assessment, such as:

- (1) Any notice, draft and final restoration plans, and public comments;
 - (2) Any relevant data, investigation reports, scientific studies, work plans, quality assurance plans, and literature; and
 - (3) Any agreements, not otherwise privileged, among the participating trustees or with the responsible parties.
- (b) Federal trustees should maintain the administrative record in a manner consistent with the Administrative Procedure Act, 5 U.S.C. 551-59, 701-06.

Subpart E—Restoration Planning Phase

§ 990.50 Purpose.

The purpose of this subpart is to provide a process by which trustees evaluate and quantify potential injuries (injury assessment), and use that information to determine the need for and scale of restoration actions (restoration selection).

§ 990.51 Injury assessment—injury determination.

(a) *General.* After issuing a Notice of Intent to Conduct Restoration Planning under § 990.44 of this part, trustees must determine if injuries to natural resources and/or services have resulted from the incident.

(b) *Determining injury.* To make the determination of injury, trustees must evaluate if:

(1) The definition of injury has been met, as defined in § 990.30 of this part; and
(2)(i) An injured natural resource has been exposed to the discharged oil, and a pathway can be established from the discharge to the exposed natural resource; or

(ii) An injury to a natural resource or impairment of a natural resource service has occurred as a result of response actions or a substantial threat of a discharge of oil.

(c) *Identifying injury.* Trustees must determine whether an injury has occurred and, if so, identify the nature of the injury. Potential categories of injury include, but are not limited to, adverse changes in: survival, growth, and reproduction; health, physiology and biological condition; behavior; community composition; ecological processes and functions; physical and chemical habitat quality or structure; and public services.

(d) *Establishing exposure and pathway.* Except for injuries resulting from response actions or incidents involving a substantial threat of a discharge of oil, trustees must establish whether natural resources were exposed, either directly or indirectly, to the discharged oil from the incident, and estimate the amount or concentration and spatial and temporal extent of the exposure. Trustees must also determine whether there is a pathway linking the incident to the injuries. Pathways may include, but are not limited to, the sequence of events by which the discharged oil was transported from the incident and either came into direct physical contact with a natural resource, or caused an indirect injury.

(e) *Injuries resulting from response actions or incidents involving a substantial threat of a discharge.* For injuries resulting from response actions or incidents involving a substantial threat of a discharge of oil, trustees must determine whether an injury or an impairment of a natural resource service has occurred as a result of the incident.

(f) *Selection of injuries to include in the assessment.* When selecting potential injuries to assess, trustees should consider factors such as:

- (1) The natural resources and services of concern;
- (2) The procedures available to evaluate and quantify injury and associated time and cost requirements;
- (3) The evidence indicating exposure;
- (4) The pathway from the incident to the natural resource and/or service of concern;
- (5) The adverse change or impairment that constitutes injury;
- (6) The evidence indicating injury;
- (7) The mechanism by which injury occurred;
- (8) The potential degree, and spatial and temporal extent of the injury;
- (9) The potential natural recovery period; and
- (10) The kinds of primary and/or compensatory restoration actions that are feasible.

§ 990.52 Injury assessment—quantification.

(a) *General.* In addition to determining whether injuries have resulted from the incident, trustees must quantify the degree, and spatial and temporal extent of such injuries relative to baseline.

(b) *Quantification approaches.* Trustees may quantify injuries in terms of:

- (1) The degree, and spatial and temporal extent of the injury to a natural resource;
- (2) The degree, and spatial and temporal extent of injury to a natural resource, with subsequent translation of that adverse change to a reduction in services provided by the natural resource; or
- (3) The amount of services lost as a result of the incident.

(c) *Natural recovery.* To quantify injury, trustees must estimate, quantitatively or qualitatively, the time for natural recovery without restoration, but including any response actions. The analysis of natural recovery may consider such factors as:

- (1) The nature, degree, and spatial and temporal extent of injury;
- (2) The sensitivity and vulnerability of the injured natural resource and/or service;
- (3) The reproductive and recruitment potential;
- (4) The resistance and resilience (stability) of the affected environment;
- (5) The natural variability; and
- (6) The physical/chemical processes of the affected environment.

§ 990.53 Restoration selection—developing restoration alternatives.

(a) *General.* (1) If the information on injury determination and quantification under §§ 990.51 and 990.52 of this part and its relevance to restoration justify restoration, trustees may proceed with the Restoration Planning Phase. Otherwise, trustees may not take additional action under this part. However, trustees may recover all reasonable assessment costs incurred up to this point.

(2) Trustees must consider a reasonable range of restoration alternatives before selecting their preferred alternative(s). Each restoration alternative is comprised of primary and/or compensatory restoration components that address one or more specific injury(ies) associated with the incident. Each alternative must be designed so that, as a package of one or more actions, the alternative would make the environment and public whole. Only those alternatives considered technically feasible and in accordance with applicable laws, regulations, or permits may be considered further under this part.

(b) *Primary restoration.* (1) *General.* For each alternative, trustees must consider primary restoration actions, including a natural recovery alternative.

(2) *Natural recovery.* Trustees must consider a natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline.

(3) *Active primary restoration actions.* Trustees must consider an alternative comprised of actions to directly restore the natural resources and services to baseline on an accelerated time frame. When identifying such active primary restoration actions, trustees may consider actions that:

(i) Remove conditions that would prevent or limit the effectiveness of any restoration action (e.g., residual sources of contamination);

(ii) May be necessary to return the physical, chemical, and/or biological conditions necessary to allow recovery or restoration of the injured natural resources (e.g., replacing substrate or vegetation, or modifying hydrologic conditions); or

(iii) Return key natural resources and services, and would be an effective approach to achieving or accelerating a return to baseline (e.g., replacing essential species, habitats, or public services that would facilitate the replacement of other, dependent natural resource or service components).

(c) *Compensatory restoration.* (1) *General.* For each alternative, trustees must also consider compensatory restoration actions to compensate for the interim loss of natural resources and services pending recovery.

(2) *Compensatory restoration actions.* To the extent practicable, when evaluating compensatory restoration actions, trustees must consider compensatory restoration actions that provide services of the same type and quality, and of comparable value as those injured. If, in the judgment of the trustees, compensatory actions of the same type and quality and comparable value cannot provide a reasonable range of alternatives, trustees should identify actions that provide natural resources and services of comparable type and quality as those provided by the injured natural resources. Where the injured and replacement natural resources and services are not of comparable value, the scaling process will involve valuation of lost and replacement services.

(d) *Scaling restoration actions.* (1) *General.* After trustees have identified the types of restoration actions that will be considered, they must determine the scale of those actions that will make the environment and public whole. For primary restoration actions, scaling generally applies to actions involving replacement and/or acquisition of equivalent of natural resources and/or services.

(2) *Resource-to-resource and service-to-service scaling approaches.* When determining the scale of restoration actions that provide natural resources and/or services of the same type and quality, and of comparable value as those lost, trustees must consider the use of a resource-to-resource or service-to-service scaling approach. Under this approach, trustees determine the scale of restoration actions that will provide natural resources and/or services equal in quantity to those lost.

(3) *Valuation scaling approach.* (i) Where trustees have determined that neither resource-to-resource nor service-to-service scaling is appropriate, trustees may use the valuation scaling approach. Under the valuation scaling approach, trustees determine the amount of natural resources and/or services that must be provided to produce the same value lost to the public. Trustees must explicitly measure the value of injured natural resources and/or services, and then determine the scale of the restoration action necessary to produce natural resources and/or services of equivalent value to the public.

(ii) If, in the judgment of the trustees, valuation of the lost services is practicable, but valuation of the replacement natural resources and/or services cannot be performed within a reasonable time frame or at a reasonable cost, as determined by § 990.27(a)(2) of this part, trustees may estimate the dollar value of the lost services and select the scale of the restoration action that has a cost equivalent to the lost value. The responsible parties may request that trustees value the natural resources and services provided by the restoration action following the process described in § 990.14(c) of this part.

(4) *Discounting and uncertainty.* When scaling a restoration action, trustees must evaluate the uncertainties associated with the projected consequences of the restoration action, and must discount all service quantities and/or values to the date the demand is presented to the responsible parties. Where feasible, trustees should use risk-adjusted measures of losses due to injury and of gains from the restoration action, in conjunction with a riskless discount rate representing the consumer rate of time preference. If the streams of losses and gains cannot be adequately adjusted for risks, then trustees may use a discount rate that incorporates a suitable risk adjustment to the riskless rate.

§ 990.54 Restoration selection—evaluation of alternatives.

(a) *Evaluation standards.* Once trustees have developed a reasonable range of restoration alternatives under § 990.53 of this part, they must evaluate the proposed alternatives based on, at a minimum:

- (1) The cost to carry out the alternative;
- (2) The extent to which each alternative is expected to meet the trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses;
- (3) The likelihood of success of each alternative;
- (4) The extent to which each alternative will prevent future injury as a result of the incident, and avoid collateral injury as a result of implementing the alternative;

(5) The extent to which each alternative benefits more than one natural resource and/or service; and

(6) The effect of each alternative on public health and safety.

(b) *Preferred restoration alternatives.* Based on an evaluation of the factors under paragraph (a) of this section, trustees must select a preferred restoration alternative(s). If the trustees conclude that two or more alternatives are equally preferable based on these factors, the trustees must select the most cost-effective alternative.

(c) *Pilot projects.* Where additional information is needed to identify and evaluate the feasibility and likelihood of success of restoration alternatives, trustees may implement restoration pilot projects. Pilot projects should only be undertaken when, in the judgment of the trustees, these projects are likely to provide the information, described in paragraph (a) of this section, at a reasonable cost and in a reasonable time frame.

§ 990.55 Restoration selection—developing restoration plans.

(a) *General.* OPA requires that damages be based upon a plan developed with opportunity for public review and comment. To meet this requirement, trustees must, at a minimum, develop a Draft and Final Restoration Plan, with an opportunity for public review of and comment on the draft plan.

(b) *Draft Restoration Plan.* (1) The Draft Restoration Plan should include:

- (i) A summary of injury assessment procedures used;
- (ii) A description of the nature, degree, and spatial and temporal extent of injuries resulting from the incident;
- (iii) The goals and objectives of restoration;
- (iv) The range of restoration alternatives considered, and a discussion of how such alternatives were developed under Sec. 990.53 of this part, and evaluated under § 990.54 of this part;
- (v) Identification of the trustees' tentative preferred alternative(s);
- (vi) A description of past and proposed involvement of the responsible parties in the assessment; and
- (vii) A description of monitoring for documenting restoration effectiveness, including performance criteria that will be used to determine the success of restoration or need for interim corrective action.

(2) When developing the Draft Restoration Plan, trustees must establish restoration objectives that are specific to the injuries. These objectives should clearly specify the desired outcome, and the performance criteria by which successful restoration will be judged. Performance criteria may include structural, functional, temporal, and/or other demonstrable factors. Trustees must, at a minimum, determine what criteria will:

- (i) Constitute success, such that responsible parties are relieved of responsibility for further restoration actions; or
- (ii) Necessitate corrective actions in order to comply with the terms of a restoration plan or settlement agreement.

(3) The monitoring component to the Draft Restoration Plan should address such factors as duration and frequency of monitoring needed to gauge progress and success, level of sampling needed to detect success or the need for corrective action, and whether monitoring of a reference or control site is needed to determine progress and success. Reasonable monitoring and oversight costs cover those activities necessary to gauge the progress, performance, and success of the restoration actions developed under the plan.

(c) *Public review and comment.* The nature of public review and comment on the Draft and Final Restoration Plans will depend on the nature of the incident and any applicable federal trustee NEPA requirements, as described in §§ 990.14(d) and 990.23 of this part.

(d) *Final Restoration Plan.* Trustees must develop a Final Restoration Plan that includes the information specified in paragraph (a) of this section, responses to public comments, if applicable, and an indication of any changes made to the Draft Restoration Plan.

Sec. 990.56 Restoration selection—use of a Regional Restoration Plan or existing restoration project.

(a) *General.* Trustees may consider using a Regional Restoration Plan or existing restoration project where such a plan or project is determined to be the preferred alternative among a range of feasible restoration alternatives for an incident, as determined under § 990.54 of this part. Such plans or projects must be capable of fulfilling OPA's intent for the trustees to restore, rehabilitate, replace, or acquire the equivalent of the injured natural resources and services and compensate for interim losses.

(b) *Existing plans or projects.* (1) *Considerations.* Trustees may select a component of a Regional Restoration Plan or an existing restoration project as the preferred alternative, provided that the plan or project:

(i) Was developed with public review and comment or is subject to public review and comment under this part;

(ii) Will adequately compensate the environment and public for injuries resulting from the incident;

(iii) Addresses, and is currently relevant to, the same or comparable natural resources and services as those identified as having been injured; and

(iv) Allows for reasonable scaling relative to the incident.

(2) *Demand.* (i) If the conditions of paragraph (b)(1) of this section are met, the trustees must invite the responsible parties to implement that component of the Regional Restoration Plan or existing restoration project, or advance to the trustees the trustees' reasonable estimate of the cost of implementing that component of the Regional Restoration Plan or existing restoration project.

(ii) If the conditions of paragraph (b)(1) of this section are met, but the trustees determine that the scale of the existing plan or project is greater than the scale of compensation required by the incident, trustees may only request funding from the responsible parties equivalent to the scale of the restoration determined to be appropriate for the incident of concern. Trustees may pool such partial recoveries until adequate funding is available to successfully implement the existing plan or project.

(3) *Notice of Intent To Use a Regional Restoration Plan or Existing Restoration Project* If trustees intend to use an appropriate component of a Regional Restoration Plan or existing restoration project, they must prepare a Notice of Intent to Use a Regional Restoration Plan or Existing Restoration Project. Trustees must make a copy of the notice publicly available. The notice must include, at a minimum:

- (i) A description of the nature, degree, and spatial and temporal extent of injuries; and
- (ii) A description of the relevant component of the Regional Restoration Plan or existing restoration project; and
- (iii) An explanation of how the conditions set forth in paragraph (b)(1) of this section are met.

Subpart F—Restoration Implementation Phase

Sec. 990.60 Purpose.

The purpose of this subpart is to provide a process for implementing restoration.

§ 990.61 Administrative record.

(a) *Closing the administrative record for restoration planning.* Within a reasonable time after the trustees have completed restoration planning, as provided in §§ 990.55 and 990.56 of this part, they must close the administrative record. Trustees may not add documents to the administrative record once it is closed, except where such documents:

- (1) Are offered by interested parties that did not receive actual or constructive notice of the Draft Restoration Plan and the opportunity to comment on the plan;
- (2) Do not duplicate information already contained in the administrative record; and
- (3) Raise significant issues regarding the Final Restoration Plan.

(b) *Opening an administrative record for restoration implementation.* Trustees may open an administrative record for implementation of restoration, as provided in Sec. 990.45 of this part. The costs associated with the administrative record are part of the costs of restoration. Ordinarily, the administrative record for implementation of restoration should document, at a minimum, all Restoration Implementation Phase decisions, actions, and expenditures, including any modifications made to the Final Restoration Plan.

§ 990.62 Presenting a demand.

(a) *General.* After closing the administrative record for restoration planning, trustees must present a written demand to the responsible parties. Delivery of the demand should be made in a manner that establishes the date of receipt by the responsible parties.

(b) *When a Final Restoration Plan has been developed.* Except as provided in paragraph (c) of this section and in Sec. 990.14(c) of this part, the demand must invite the responsible parties to either:

- (1) Implement the Final Restoration Plan subject to trustee oversight and reimburse the trustees for their assessment and oversight costs; or
- (2) Advance to the trustees a specified sum representing trustee assessment costs and all trustee costs associated with implementing the Final Restoration Plan, discounted as provided in § 990.63(a) of this part.

(c) *Regional Restoration Plan or existing restoration project.* When the trustees use a Regional Restoration Plan or an existing restoration project under Sec. 990.56 of this part, the demand will invite the responsible parties to implement a component of a Regional Restoration Plan or existing restoration project, or advance the trustees' estimate of damages based on the scale of the restoration determined to be appropriate for the incident of concern, which may be the entire project or a portion thereof.

(d) *Response to demand.* The responsible parties must respond within ninety (90) calendar days in writing by paying or providing binding assurance they will reimburse trustees' assessment costs and implement the plan or pay assessment costs and the trustees' estimate of the costs of implementation.

(e) *Additional contents of demand.* The demand must also include:

- (1) Identification of the incident from which the claim arises;
- (2) Identification of the trustee(s) asserting the claim and a statement of the statutory basis for trusteeship;
- (3) A brief description of the injuries for which the claim is being brought;
- (4) An index to the administrative record;
- (5) The Final Restoration Plan or Notice of Intent to Use a Regional Restoration Plan or Existing Restoration Project; and
- (6) A request for reimbursement of:
 - (i) Reasonable assessment costs, as defined in § 990.30 of this part and discounted as provided in Sec. 990.63(b) of this part;
 - (ii) The cost, if any, of conducting emergency restoration under § 990.26 of this part, discounted as provided in Sec. 990.63(b) of this part; and
 - (iii) Interest on the amounts recoverable, as provided in section 1005 of OPA (33 U.S.C. 2705), which allows for prejudgment and post-judgment interest to be paid at a commercial paper rate, starting from thirty (30) calendar days from the date a demand is presented until the date the claim is paid.

§ 990.63 Discounting and compounding.

(a) *Estimated future restoration costs.* When determining estimated future costs of implementing a Final Restoration Plan, trustees must discount such future costs back to the date the demand is presented. Trustees may use a discount rate that represents the yield on recoveries available to trustees. The price indices used to project future inflation should reflect the major components of the restoration costs.

(b) *Past assessment and emergency restoration costs.* When calculating the present value of assessment and emergency restoration costs already incurred, trustees must compound the costs forward to the date the demand is presented. To perform the compounding, trustees may use the actual U.S. Treasury borrowing rate on marketable securities of comparable maturity to the period of analysis. For costs incurred by state or tribal trustees, trustees may compound using parallel state or tribal borrowing rates.

(c) Trustees are referred to Appendices B and C of OMB Circular A-94 for information about U.S. Treasury rates of various maturities and guidance in calculation procedures. Copies of Appendix C, which is regularly updated, and of the Circular are available from the OMB Publications Office (202-395-7332).

§ 990.64 Unsatisfied demands.

(a) If the responsible parties do not agree to the demand within ninety (90) calendar days after trustees present the demand, the trustees may either file a judicial action for damages or seek an appropriation from the Oil Spill Liability Trust Fund, as provided in section 1012(a)(2) of OPA (33 U.S.C. 2712(a)(2)).

(b) Judicial actions and claims must be filed within three (3) years after the Final Restoration Plan or Notice of Intent to Use a Regional Restoration Plan or Existing Restoration Project is made publicly available, in accordance with 33 U.S.C. 2717(f)(1)(B) and 2712(h)(2).

§ 990.65 Opening an account for recovered damages.

(a) *General.* Sums recovered by trustees in satisfaction of a natural resource damage claim must be placed in a revolving trust account. Sums recovered for past assessment costs and emergency restoration costs may be used to reimburse the trustees. All other sums must be used to implement the Final Restoration Plan or all or an appropriate component of a Regional Restoration Plan or an existing restoration project.

(b) *Joint trustee recoveries.* (1) *General.* Trustees may establish a joint account for damages recovered pursuant to joint assessment activities, such as an account under the registry of the applicable federal court.

(2) *Management.* Trustees may develop enforceable agreements to govern management of joint accounts, including agreed-upon criteria and procedures, and personnel for authorizing expenditures out of such joint accounts.

(c) *Interest-bearing accounts.* Trustees may place recoveries in interest-bearing revolving trust accounts, as provided by section 1006(f) of OPA (33 U.S.C. 2706(f)). Interest earned on such accounts may only be used for restoration.

(d) *Escrow accounts.* Trustees may establish escrow accounts or other investment accounts.

(e) *Records.* Trustees must maintain appropriate accounting and reporting procedures to document expenditures from accounts established under this section.

(f) *Oil Spill Liability Trust Fund.* Any sums remaining in an account established under this section that are not used either to reimburse trustees for past assessment and emergency restoration costs or to implement restoration must be deposited in the Oil Spill Liability Trust Fund, as provided by section 1006(f) of OPA (33 U.S.C. 2706(f)).

§ 990.66 Additional considerations.

(a) Upon settlement of a claim, trustees should consider the following actions to facilitate implementation of restoration:

- (1) Establish a trustee committee and/or memorandum of understanding or other agreement to coordinate among affected trustees, as provided in § 990.14(a)(3) of this part;
 - (2) Develop more detailed workplans to implement restoration;
 - (3) Monitor and oversee restoration; and
 - (4) Evaluate restoration success and the need for corrective action.
- (b) The reasonable costs of such actions are included as restoration costs.

In support of the NRDA regulations under OPA and for the purpose of facilitating the NRDA process under OPA, NOAA has produced a number of related guidance documents, in addition to the Preassessment Phase Guidance Document, that are relevant to preassessment activities. All of these documents are currently available in final form.

NOAA. 1996. Injury Assessment, Guidance Document for Natural Resource Damage Assessment under the Oil Pollution Act of 1990. National Oceanic and Atmospheric Administration, Damage Assessment and Restoration Program, Silver Spring, MD.

NOAA. 1996. Specifications for Use of the NRDAM/CME Version 2.4 to Generate Compensation Formulas, Guidance Document for Natural Resource Damage Assessment under the Oil Pollution Act of 1990. National Oceanic and Atmospheric Administration, Damage Assessment and Restoration Program, Silver Spring, MD.

NOAA. 1996. Primary Restoration, Guidance Document for Natural Resource Damage Assessment under the Oil Pollution Act of 1990. National Oceanic and Atmospheric Administration, Damage Assessment and Restoration Program, Silver Spring, MD.

NOAA. 1996. Restoration Planning, Guidance Document for Natural Resource Damage Assessment under the Oil Pollution Act of 1990. National Oceanic and Atmospheric Administration, Damage Assessment and Restoration Program, Silver Spring, MD.

This document uses various technical terms that require a clear definition. This Glossary provides the needed definitions. This Glossary, however, does not include those terms already defined under § 990.30 of the OPA regulations.

Accuracy (data): The closeness of a measured value to its true value.

Acute: An effect in which the organism of interest is exposed to the contaminant such as oil for only a small portion of its life cycle (i.e., generally less than four days). Typical effects endpoints include mortality or immobility.

Analyte: The specific component measured in a chemical analysis.

API Gravity: A scale of specific gravities for petroleum fluids. Based on a simple inverse relationship with specific gravity.

Benthic: Pertaining to the bottom of a body of water.

Binding Proteins: Protein structures in organisms that serve as host biomarkers to potentially toxic substances resulting in select stress responses.

Bioaccumulation: The process by which a contaminant such as oil is taken up by organisms directly through the physical exposure pathway or through consumption of food containing the contaminated substance. Bioaccumulation incorporates the concepts of bioconcentration and biomagnification.

Bioavailability: The tendency of a contaminant such as oil to partition in a form conducive to uptake by organisms.

Bioconcentration: The process by which a contaminant such as oil is directly taken up (i.e., by absorption only) from water and is accumulated to levels greater than those found in the surrounding water.

Biodegradation: The process of degradation of a contaminant such as oil because of its use as a food source for certain microorganisms. This process is limited to a great extent by temperature, nutrients, and oxygen availability.

Biological (Natural) Resource: The resource referred to in section 1001(20) of OPA as fish, wildlife, and biota. Fish and wildlife include marine and freshwater aquatic and terrestrial species; game, nongame and commercial species; and species listed as endangered or threatened under Federal or State law. Biota encompasses shellfish, terrestrial, and aquatic plants and other living organisms not otherwise listed in this definition.

Biomagnification: The increase in tissue concentrations of a bioaccumulated chemical substance such as oil as it passes up through the trophic levels.

Biomarker: A biochemical, physiological, or histological indicator of either exposure to, or effects of, xenobiotic contaminants such as oil at the suborganismal or organismal level.

Blank: A QA sample of a pure substance that is used to measure the contribution of analytes from all laboratory sources external to the sample.

Boiling Point: The temperature at which the vapor pressure of a specified liquid equals the atmospheric pressure.

Brackish: Pertaining to water with a low salt content, usually up to five parts per thousand during the period of average annual low flow.

By-product: A substance produced as a result of the transformation of the original product.

Chronic: An effect in which the organism of interest is exposed to the contaminant such as oil for a significant stage of its life cycle or the entire life cycle (i.e., generally weeks to years depending on the reproductive life cycle of the organism). Typical effects endpoints include reproductive, growth, or development impairment as well as behavioral changes.

Community (Biological): An assemblage of populations that live in an environment and interact with one another forming a distinctive living system with its own composition, structure, environmental relations, development, and function.

Comparable (data): A measure of confidence in being able to contrast one data set with another.

Completeness: The amount of valid data obtained (i.e., that met QA acceptance criteria) compared to the planned amount.

Composite: A homogenized collection of distinct samples.

Control: The condition where all variables, except the presence of the oil, are the same and can be manipulated, measured, and monitored.

Data: Measures related to the oil discharge and environmental setting.

Depuration: A process that results in elimination of a substance from organisms.

Dispersion: A process that results from the incorporation of small particles or globules of oil (ranging in size from $< 0.5 \mu\text{m}$ to several mm) into the water column and can be maintained by continuous agitation (i.e, storms or turbulent waters).

Dissolution: The process of dissolving oil in the medium of concern, usually water. Dissolution is typically slow due to the slightly soluble hydrocarbons and various mineral salts present in the oil.

Downwelling: The physical process where surface waters sink due to a higher density relative to surrounding waters.

Duplicate: A second analysis made on the same sample or second sample.

Ecosystem: The biological community and its environment that, together, function as a system of complimentary relationships, with the transfer and circulation of energy and matter.

Emulsification: The process whereby oil is incorporated into the medium of concern, usually water, in the form of small droplets. Emulsions in water can either be oil in-water or water-in-oil, formed as a result of wave actions.

Endpoint: Response of a natural resource or service to a contaminant such as oil in the field or laboratory.

Environmental Setting: The total natural background of a site, including its physical, chemical, and biological components.

Ephemeral: The physical or biological components of the environment that are short lived or transitory.

Evaporation: The single most important weathering process for the first several days of an oil discharge. Results in a loss of the lighter fractions through volatilization from petroleum products (e.g., benzenes, naphthalenes).

Fate: The disposition of a contaminant such as oil in various environmental media as a result of transport, transformation, and degradation.

Fingerprinting: An analytical process of characterizing a contaminant such as oil to determine if an unknown sample in the environment is the same as that from the source.

Grab: A distinct sample.

Habitat: The area that supports a given organism, population, or community.

Histopathology: The study of tissue responses to injury.

Historical Data: Data that are collected for a natural resource and/or service that is spatially or temporally discontinuous.

In-Situ: Performed or observed in the environment of concern.

Intertidal: The region between highest and lowest tide lines (i.e., that region covered with water at high tide and exposed at low tide) in a marine, estuarine, or tidal freshwater environment.

Lesion: A cellular injury to an organ or area of tissue that may result in an impairment or loss of function.

Lethal: Causing death by direct action (i.e., cessation of all visible signs of biological activity).

Lipophilic: Having a strong attraction for fats.

Metabolite: A substance produced by or taking part in metabolism.

Natural Resource Damage Assessment (NRDA): The process of collecting and analyzing information to evaluate the nature and extent of injuries resulting from an incident, and determine the restoration actions needed to bring injured natural resources and services back to baseline and make the environment and public whole for interim losses.

Necrotic: Dead or decaying tissue.

Neat Oil: Fresh, unweathered oil.

Neoplasm: An abnormal growth of issue (e.g., tumor).

Organism: An individual animal or plant having diverse parts that function together as a whole to maintain life and its activities.

Perishable: The biological substances likely to deteriorate if not collected immediately.

Petrogenic: Oil or petroleum derived.

Photo-oxidation: Transformation of petroleum hydrocarbons through an autocatalytic free-radical chain reaction through the use of natural sunlight.

Population (biological): A group of organisms of the same species, generally occupying a contiguous area, and capable of interbreeding.

Pour Point: The lowest temperature at which oil will flow in the medium of concern, usually water, under specified conditions.

Precise (data): The degree of agreement between independent measurements as a result of repeated applications of a method under specified conditions (i.e., closeness of replicate measures).

Protocol: A scientific, economic, legal, or regulatory accepted procedure used as guidance to implement an activity.

Pyrogenic: Combustion-derived.

Quadrat: A sampling plot, usually one square meter, used to study organisms.

Quality Assurance (QA): The total integrated program for assuring the reliability of collected data.

Quality Assurance Project Plan: An orderly assemblage of detailed and specific procedures that delineates how data of known and acceptable quality are produced for a specific project or study within the NRDA.

Receptor: A natural resource and/or service or component of that resource and/or service that may be adversely affected by a contaminant such as oil.

Reference: A natural resource or service that is physically, chemically, and biologically similar to that affected by a discharge.

Replicate: One of a number of independent observations the total of which make up a sample to determine variability.

Representative (data): The degree to which data accurately and precisely reflect the conditions or parameters being sampled.

Sample: A selected segment of a population studied to gain knowledge of the whole.

Sampling: The process of taking observations of a population.

Significant: A difference, at a specified probability level, between or among two or more sampling distributions.

Solubility: A measure of oil that can be dissolved in a solvent, usually water. The solubility of oil in water is extremely low, generally less than 5 ppm. Solubility is an important measure in relation to the potential toxicity of hydrocarbons to biota.

Specific Gravity: The ratio of the mass of the oil to the mass of an equivalent volume of the water. The specific gravity of an oil is a measure of its density and affects its ease of dispersion. Since most crude oils and refined petroleum products have specific gravities that are less than the specific gravity of water, these oils generally will float on water initially. The only exceptions are certain heavy crudes and residual fuel oils.

Spreading: The process whereby oil floating on water increases in area over time. Oil of lower viscosity spreads at a faster rate than that of higher viscosity.

Spike: The addition of a known amount of a substance to a sample.

Statistical Analysis: The formal mathematical statements of the specific hypotheses to be tested.

Study Design: The plan that addresses the level of effort required in implementing an assessment.

Sublethal: Below the concentration that directly causes death (i.e., effects on behavior, biochemical or physiological function, and tissue integrity).

Subtidal: The region in marine, estuarine, or tidal freshwater environments that is deeper than the lowest tide line, such that it is always submerged at any tidal height.

Toxicity: The inherent potential of a contaminant such as oil to adversely affect individual organisms.

Toxicity Test: An evaluation of the potential of a contaminant to cause an adverse biological response.

Transport: The movement of a contaminant such as oil from one location to another.

Uncertainty: The total variability in data collection and analysis, including systematic (human bias) and random errors.

Variable: A measurement or observation of an attribute characteristic of a natural resource or service of interest.

Variability: The difference between replicate measurements or observations (i.e., within sample variability) or between sample statistics (i.e., between sample variability).

Vertical Shear Profiles: The physical condition where current velocities (i.e., both speed and direction) vary with depth. A plot of current velocity as a function of depth is a vertical shear profile.

Viscosity: The measure of the flow resistance of the oil. Viscosity is important in terms of its environmental fate and effects. Viscosity of oil decreases rapidly with an increase in temperature. Viscosity increases as oil weathers since low molecular weight, volatile fractions are lost most rapidly.

Volatility: The degree to which fractions of oil evaporate. Volatility is measured by vapor pressure.

Weathering: The alteration of the physical and chemical properties of discharged oil through a series of natural processes which begin when the discharge occurs and continue until the oil is removed. Major processes which contribute to weathering include evaporation, dissolution, photo-oxidation, emulsification, and biodegradation.

Xenobiotic: A foreign chemical or substance, such as discharges of oil, not produced in nature nor normally considered a constitutive component of a specified biological system.

Table of Contents

D.1 Introduction	D-1
D.2 Sample Agreement among Trustees	D-1
D.3 General Framework for a Draft Agreement among Trustees and RPs.....	D-12
D.4 Draft Agreement among Trustees and RPs.....	D-21

D.1 Introduction

Three example agreements are provided below, a sample agreement among trustees (referred to as the Memorandum of Understanding or MOU) and two draft templates (a general framework and an incident-specific agreement) among trustees and RPs (referred to as the Memorandum of Agreement or MOA). Trustees may use these agreements as templates for other incidents.

D.2 Sample Agreement among Trustees

I. INTRODUCTION

**MEMORANDUM OF AGREEMENT
AMONG THE
TEXAS NATURAL RESOURCE CONSERVATION COMMISSION,
TEXAS PARKS AND WILDLIFE DEPARTMENT,
TEXAS GENERAL LAND OFFICE,
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION,
AND
UNITED STATES DEPARTMENT OF THE INTERIOR**

This Memorandum of Agreement (MOA) executed by the Texas Natural Resource Conservation Commission (TNRCC), Texas Parks and Wildlife Department (TPWD), Texas General Land Office (TGLO), the National Oceanic and Atmospheric Administration of the United States Department of Commerce (NOAA), and the United States Department of the Interior (DOI) (collectively referred to as the Trustees) is entered into in recognition of their common interests and/or responsibilities as designated natural resource trustees, including their coordination and cooperation in the initiation and conduct of natural resource damage assessments, settlement negotiations, development of positions for covenants not to sue or administrative releases from liability, or development and support of claims for litigation for injuries to natural resources resulting from discharges of oil or releases of hazardous substances, and the application of any natural resource damages recovered via any of those mechanisms toward the restoration, rehabilitation, replacement, and/or acquisition of equivalent natural resources.

II. PARTIES

The following Trustees or their designees are Parties to this MOA and act on behalf of the public as Trustees for natural resources under this MOA:

1. The Executive Director of the Texas Natural Resource Conservation Commission,
2. The Executive Director of the Texas Parks and Wildlife Department,
3. The Commissioner of the Texas General Land Office,
4. The Director, Office of Ocean Resource Conservation and Assessment, National Oceanic and Atmospheric Administration, acting on behalf of the Secretary of Commerce, and
5. The Secretary of the Department of the Interior.

Notwithstanding any other provision of this MOA, the participation of any natural resource trustee who is not a party to the MOA and who has a natural resource interest that is affected by a discharge of oil or release of a hazardous substance shall not be precluded from participating in the natural resource damage assessment process by this MOA. Such other trustees may include, but are not limited to Tribal governments, other Federal agencies, foreign countries, local governments, or affected trustee agencies from other States, which may be added by addendum to this MOA, as necessary, provided that statutory authority exists designating such other parties as Trustees.

III. LOCATION

This MOA addresses natural resources within the boundaries of the State of Texas that are held in trust by both the Federal and State Trustees which are injured as a result of discharges of oil as defined by the Federal Water Pollution Control Act, 33 U.S.C. § 1251 et seq. (“FWPCA”), the Oil Pollution Act of 1990, 22 U.S.C. § 2701 et seq. (“OPA”), the Texas Oil Spill Prevention and Response Act, Chapter 40, TEX. NAT. RES. CODE ANN. (“OSPRA”), the Texas Water Code, or the Texas Natural Resources Code, or releases of hazardous substances as defined by the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C.A. § 9601 (“CERCLA”), or the authorities already listed above, including surface and ground waters of the State out to the three marine league line (10.2 miles), the seaward boundary of the State, or injuries that may occur from discharges or releases in waters seaward of the State’s boundary with the potential of migrating landward of the State’s seaward boundary.

IV. PURPOSE

The Trustees recognize the importance of integrating and coordinating among themselves and with the lead response, removal, remedial, or corrective action agencies in the reduction of risk to trust resources, and assessment of injuries or the potential threat of injuries to natural resources affected by discharges of oil or releases of hazardous substances including the consequences of removal, remedial, and corrective actions. The Trustees' primary goals are to ensure the restoration of injured natural resources and to seek compensation for interim lost use value caused by discharges of oil or releases of hazardous substances in order to restore, replace, rehabilitate, and/or acquire the equivalent of those affected resources and/or their services. In order to achieve their ultimate goals stated above, the Trustee's activities will primarily involve coordination of all planning, assessments and investigations with the lead response agency, ensuring protection or restoration of injured resources and/or their services as part of the removal, remedial or corrective action, determination of conditions upon which the Trustees may grant a covenant not to sue or other type of judicial or administrative release from liability during consent decree or other negotiations, or otherwise assessing and seeking damages for injuries to natural resources and/or the services they provide. The purpose of this MOA is to provide a framework for such coordination and cooperation among the Trustees, and for the implementation of the activities of the Trustees in furtherance of their natural resource Trustee responsibilities for those natural resources affected by those discharges or releases mentioned above. While this document is designed to eliminate the need for incident-specific MOAs, those additional MOAs may be useful or necessary in some cases.

V. AUTHORITY

The Trustees enter into this MOA in accordance with the legal authorities provided for each Trustee by the National Contingency Plan, 40 C.F.R. Part 300, FWPCA, OPA, CERCLA, the Natural Resource Damage Assessment Regulations, 43 C.F.R. Part 11, or the OPA regulations, when promulgated, and any other applicable laws or authorities. The State Trustees enter into this MOA pursuant to their designation by the Governor of Texas under CERCLA, OPA, OSPRA, and the Texas Natural Resource Damage Assessment Regulations, 31 T.A.C. 20, or any other applicable laws or authorities.

VI. TRUSTEE FUNCTIONS

The Trustees or their representatives or designees shall seek to abate, through appropriate response coordination, potential threats, reduce risks, or assess damages for injury to, destruction of, loss of, or loss of use of, natural resources, resulting from unauthorized discharges of oil or releases of hazardous substances, including recovering response costs and the reasonable costs of assessing the damages. The measure of damages shall be the cost of restoring, replacing, rehabilitating, or acquiring the equivalent of the injured natural resources and/or services, plus interim lost use or diminution in value pending recovery, assessment costs, and Trustee administrative oversight and procedural costs associated with planning and administering or implementing the restoration of those natural resources and/or services. The Trustees recognize the Congressional and legislative intent that restoration is the preferred alternative wherever possible and practicable.

Consistent with their individual authorities and policies, the Trustees or their representatives or designees may employ one of several types of actions, depending on the circumstances of each discharge or release, in order to carry out their responsibility to minimize or eliminate risk, or to seek restoration and compensation. Such Trustee actions may include, but are not limited to:

- A. Performing preliminary assessments to determine the potential threat or the nature and extent of threats to natural resources;
- B. Preventing injury, destruction, or loss through requests for initiation of removal or remedial actions by authorized agencies, or by seeking such injunctive relief where authorized by law;
- C. Performing emergency restoration actions and seeking cost recovery for those actions;
- D. Minimizing residual natural resource injuries by participating in removal, remedial, or corrective actions as advisors to the lead response agency, and seeking restoration and compensation for any past or residual injury at remedial or corrective action sites;
- E. Negotiating a judicial covenant not to sue for natural resource damages for incidents covered by CERCLA, where appropriate, through the U.S. Department of Justice and the Office of the Texas Attorney General;
- F. Performing natural resource damage assessments;

- G. Negotiating administrative or judicial agreements for resource protection measures, restoration, and/or compensation for natural resource damages;
- H. Referring claims for natural resource damages for litigation; and/or
- I. Preparing and implementing restoration plans.

VII. RESTORATION AND COMPENSATION GOAL

The goal of restoration or compensation projects is to assure that no net loss of natural resources or their services occurs. Prior to the consideration of restoration alternatives, the Trustees will strive to have any continuing releases that would impede natural recovery or limit the effectiveness of restoration activities controlled. In addition, the restoration of chemical and physical quality of the environment to baseline or no effects levels will be sought. Methods to accelerate the rate of return of injured habitats or ecosystems to baseline levels of services will be used whenever possible. Key species should be restored to baseline levels and lost services should be replaced as directly as possible. Consistent with the guidelines above, the following hierarchy will be considered when the Trustees evaluate restoration or compensation project options: 1) on-site and in-kind—natural resources or services are restored at the site of injury and are physically and biologically the same as those lost; 2) off-site and in-kind—natural resources or services are restored at a site different than where injuries occurred but are physically and biologically the same as those lost; and 3) on-site and out-of-kind—natural resources or services are restored at the affected site but are physically and biologically different than those injured. The Trustees understand that circumstances may arise that may require the revision of this hierarchy of preferences. Such revision may include, but is not limited to, the consideration of additional restoration or compensation options that are within the scope of Trustees' authority and this MOA, such as: 1) off-site and out-of-kind—natural resources that are physically and biologically different than those lost are restored on a site different than the one affected but preferably in the same watershed or ecosystem; or 2) acquisition of equivalent natural resources and/or services under private ownership which replaces the lost natural resources or services by reducing future losses by placing acquired resources under public ownership and protection.

VIII. TRUSTEE ORGANIZATION

The Trustees and their representatives recognize the importance of planning and coordinating their efforts in order to effectively and efficiently meet their respective natural resource trustee responsibilities under applicable Federal and State law. The Trustees and/or Trustee representatives, or Trustee Council members (see below), will coordinate their efforts to ensure the following: 1) that notifications of discharges or releases will be relayed to all Trustee agencies according to the National Contingency Plan or Area Contingency Plans; 2) that sites with co-Trustee interests are identified by response agencies, including, but not limited to NPL sites, RCRA facilities, State Superfund sites, instantaneous discharges of oil or releases of hazardous substances, and fish or shellfish closures or advisories due to the discharge of oil or release of hazardous substances; 3) where possible, coordination of written comments to the lead agency On Scene Coordinators or Remedial Project Managers on all lead agency directed scopes of work, work plans, assessments and investigations, including remedial investigations, feasibility studies, and remedial designs; and 4) State and Federal coordination in consent decree, administrative agreement, or other types of negotiations. Notification, as referred to above, shall be made by telephone (with direct contact), or by letter or facsimile to persons designated to receive such information.

For each individual case or incident involving significant participation by two or more State and Federal Trustees, the Trustees agree to create a council (Trustee Council) representing the Trustees (Trustees Council) which will implement this MOA and to which a representative will be designated by each Trustee agency. The Trustees agree to appoint representatives to the Trustee Council who have the level of knowledge and expertise needed to effectively guide the damage assessment and restoration process. Agencies agree to appoint representatives to the Trustee Council who have, at a minimum, the level of authority necessary to make decisions on issues presented to the Council. The Trustees may create Trustee Councils for either a portion of, or the entire damage assessment and restoration processes. For example, the Trustees may create one council to address the damage assessment phase and another to handle the restoration phase. The Trustee Council will designate a Lead Administrative Trustee for individual cases or incidents for administrative purposes. The Trustee Council may seek additional legal or scientific expertise outside its membership when needed. Each Trustee agency will notify Council members when representatives resign and agree to inform other Trustee representatives about who the replacement will be. For individual incidents, the Trustee Council will attempt to name the Lead Administrative Trustee within 24 hours of Trustee notification in order that a Trustee point of contact be established as rapidly as possible. In addition, where appropriate, the Federal Trustees shall designate a lead Federal Trustee for the purposes of accessing the Federal Oil Spill Liability Trust Fund.

IX. TRUSTEE COUNCIL DUTIES AND RESPONSIBILITIES

On behalf of the Trustees, the Trustee Council created to address each incident shall coordinate and authorize (consistent with applicable law, policy, mandated areas of jurisdiction, and areas of special expertise) all Trustee activities and matters under this MOA in accordance with the decision making requirements contained in Section X. The Trustee Council may take whatever actions it determines are appropriate to fulfill the trust responsibilities of the Trustees under and to effectuate the purposes of applicable Federal and State law. It is expected that the Trustee Council may, as appropriate and consistent with each representative's delegated Trustee authority, take any of the following actions, among others, while focusing on to heir individual trust resource responsibilities related to a particular incident:

- A. Conduct or oversee scientific and technical studies, sampling, and other matters related to the determination of injuries and/or the assessment of damages for trust resources which may have been lost, injured or destroyed.
- B. Seek compensation from responsible parties for damages and/or restoration costs and for the costs of planning and implementing the assessment and/or restoration.
- C. Participate in negotiations with responsible parties.
- D. In accordance with applicable law and respective agency policy and delegation of authority, supervise, manage and obligate on behalf of the Trustees any money paid to the Trustees, except for reimbursement of assessment and administrative costs, by or on behalf of responsible parties for the purpose of assessing, restoring, replacing, rehabilitating, and/or acquiring the equivalent of the affected natural resources.
- E. Oversee the development, implementation, and appropriate monitoring of a plan for the restoration, replacement, rehabilitation, and/or acquisition of equivalent resources for those trust resources and/or their services that may be injured, destroyed or lost.
- F. In accordance with applicable law, make all necessary decisions on a case by case basis for the management and administration of funds pursuant to Section XI.
- G. In accordance with applicable law, arrange contracts with professional consultants that the Trustee Council determines are necessary.
- H. When necessary, identify a contact for coordination with the Coast Guard regarding access to the Oil Spill Liability Trust Fund.

- I. Communications with potentially responsible parties or their agents: The Trustees and Trustee Council members agree that they will endeavor to have coordinated communications with potentially responsible parties or their agents for an incident on matters related to natural resource damages and claims for those damages. To the maximum extent possible, no Trustee or Trustee Council member will discuss these matters with the potentially responsible parties without first providing the other Trustees or Trustee Council members notice and an opportunity to participate in such discussions as appropriate. The above agreement shall not preclude a Trustee or Trustee Council member from having separate communications with the potentially responsible parties on matters within the scope of the MOA where circumstances warrant, provided that each Trustee or Trustee Council member notifies the other Trustees and agrees to provide documentation of the communication for the Administrative Record.

X. LEAD ADMINISTRATIVE TRUSTEE

The duties of the Lead Administrative Trustee shall include, but are not limited to: coordination and monitoring of the progress of the formulation of technical and legal positions for covenant not to sue, administrative agreement, or other negotiations; coordination and monitoring of the progress of the natural resource damage assessment process; scheduling of meetings of the Trustee Council and notifying Trustee Council members of those meetings on a timely basis; preparing agendas for those meetings; acting as a central contact point for the Trustee Council; establishing and maintaining of records and relevant documents; and other administrative duties as directed by the Trustee Council. The Lead Administrative Trustee will be responsible for informing the other Trustee Council members and all pertinent developments on a timely basis. The Lead Administrative Trustee may delegate any of his/her duties to another Trustee representative with the concurrence of the Council. Assigned duties do not provide the Lead Administrative Trustee with decision making rights beyond those normally held by each Trustee.

XI. DECISIONMAKING

The Trustees will strive for unanimous consent on all decisions by a Trustee Council implementing this MOA. The dissent of one party will not prevent the other parties from proceeding except for the initial selection of the Lead Administrative Trustee, selection of which requires consensus. Matters in dispute by more than one agency may be elevated to the Authorized Officials of the Trustee Agencies for resolution in an expeditious manner. If necessary, the Trustees or their representatives may establish further mechanisms by which disputes may be resolved, including mediation as provided in the NRDA regulations. The Trustees further agree that decision making deliberations will focus upon the Trustees' mutual goals of mitigating injury through cleanup, source control and remediation, and of assessing, restoring, rehabilitating, replacing and/or acquiring the equivalent of the affected natural resources and services.

XII. FUNDS

The Trustees agree to cooperate in good faith to attempt to establish and maintain, to the extent consistent with applicable law, a joint trust account(s) or joint court registry account(s) for purposes of receiving, depositing, holding, disbursing, and expending all funds for the conduct of the damage assessment and restoration process, including all natural resource damage recoveries obtained or received by the Trustees and interest earned thereon. The Trustees agree that they will use all recovered damages for natural resource injuries exclusively for restoration activities consistent with Trustee Council approved Restoration Plans conducted under this MOA to address those injuries to natural resources and the services that they provide. The Trustees agree to request that administrative costs recovered from responsible parties be separately reimbursed to each individual Trustee agency.

Administrative costs, if deposited to the fund, will be disbursed by electronic transfer or by check to the individual agencies as rapidly as possible, and shall be used at the individual agency's discretion. The Trustees agree to deposit any recoveries for injury to natural resources obtained or received by or on behalf of any Trustee as a result of joint damage assessment and restoration activities under Federal and/or State natural resource damage assessment regulations in a joint account(s), unless all Trustees agree that funds recovered from a particular case require different treatment.

The Trustees, in accordance with their decision making process in Section XI, shall establish standards and procedures governing the joint use of all natural resource damages received by the Trustees for the purposes of developing and administering or implementing a Final Restoration Plan for restoring, replacing, rehabilitating and/or acquiring the equivalent of natural resources injured as a result of an incident and the reduced or lost services provided by those resources.

The Trustees further agree that the reasonable costs jointly agreed upon for the initiation of damage assessment and for the planning, conduct, evaluation and coordination of all natural resource damage assessment activities pursued by the Trustee Council with respect to natural resource injuries or lost services resulting from an incident, shall be advanced or reimbursed to each Trustee out of any damage assessment cost recoveries or payments thereon, including funds received from the Oil Spill Liability Trust Fund.

XIII. CONFIDENTIALITY

The Trustees support an open government policy of providing access to scientific information created or obtained by the Trustees during the damage assessment process. The Trustees do hereby agree that any information in the possession of the Trustees shall be confidential if, and only if, such information is obtained or retrained in anticipation of litigation or during pending litigation, provided, however, that all such information is subject to disclosure pursuant to Federal and State rules of evidence and discovery. It is further understood and agreed that information subject to public disclosure upon request and pursuant to the Freedom of Information Act or the Texas Open Records Act shall be released. However, the parties acknowledge and agree that all Federal documents produced in fulfillment of obligations under the MOA that are protected from release under Federal law will be protected from release by State agencies. All Trustees agree to notify other Trustees in writing, of each request for information no more than five (5) days from the date of such request. Trustees will disseminate all relevant documents to each other so that each agency can respond to any request it receives.

XIV. RESERVATION OF RIGHTS

Except for the confidentiality agreement contained in Section XII, all parties understand that this document is not intended to create any further legal rights or obligations among the Trustees or any other persons not a party to this MOA. Nothing in this MOA is to imply that any signatory government is in any way abrogating or ceding any responsibilities or authority inherent in its control or trusteeship over natural resources.

XV. MODIFICATION OF AGREEMENT

Modification of this MOA shall be in writing and upon approval of all Trustees currently parties to the MOA. It is acknowledged that additional agreements may be executed by the Trustees with regard to natural resource damage claims that arise and for planning for the restoration, replacement, rehabilitation, and/or acquisition of equivalent natural resources that may be injured, destroyed or lost. These incident-specific MOAs shall not be considered modifications of this MOA, and will be the subject of the same procedural and substantive requirements contained herein.

XVI. TERMINATION

This MOA shall be in effect from the date of execution until terminated by agreement of the Trustees. At any time the Trustees determine that there is no purpose served by this MOA, the MOA will terminate upon such a finding. Any Trustee agency may withdraw from this MOA at any time for any reason. In the event any Trustee withdraws from the MOA, it must provide thirty days written notice before the withdrawal can become effective. In the event of such withdrawal, this MOA remains in full force and effect for the remaining parties.

In the event of the withdrawal of any Trustee, or at the termination of this MOA, each Trustee agrees to cooperate in preparing a full and complete accounting for and status report of all accounts managed jointly by the Trustees or their representatives pursuant to Section XI of this MOA.

XVII. LIMITATION

Nothing in this MOA shall be construed as obligating the United States, the State or any other public agency, their officers, agents or employees, to expend any funds in excess of appropriations authorized by law.

XVIII. THIRD PARTY CHALLENGES OR APPEALS

The rights and responsibilities contained in this MOA are subject to the availability of funding and are intended to be guidance for the respective Trustees. They may not be the basis of any third party challenges or appeals. Nothing in this MOA creates any rights or causes of action in persons not parties to this agreement.

XIX. EXECUTION: EFFECTIVE DATE

This MOA may be executed in counterparts. A copy with all original executed signature pages affixed shall constitute the original MOA. The date of execution shall be the date of the final Trustee's signature.

D.3 General Framework for a Draft Agreement among Trustees and RPs

STATEMENT OF COMMITTEE REGARDING MODEL MEMORANDUM OF AGREEMENT

The attached Memorandum of Agreement (MOA) is intended to provide a model for Trustee/Responsible Party cooperative natural resource damage assessment action in the event of an oil spill. The model was developed by an ad hoc committee convened in Houston, Texas which was composed of representatives of state and Federal trustees, industry and protection & indemnity club correspondents. A list of those participating in the process is included.

In developing the MOA, the committee decided to create a general framework in order to promote cooperation among the parties. The heart of the document is the requirement that all assessment work, whether under the aegis of the MOA or not, will be subject to data sharing requirements. This puts the process squarely in the public domain.

The MOA has been designed so that parties may enter into the agreement immediately after a spill, before any pre-assessment or assessment work has been done. When executed at this early stage, the MOA is chiefly a statement of cooperative intent and embodies direction and guidance for proceeding with the NRDA process. The committee feels that it is important for this statement of cooperative intent to be formalized early on.

The MOA is of general application and has evolved from cooperative assessments conducted in Texas over the past few years. Although it contains language concerning trustee authority that is applicable to a spill in Texas, other appropriate state authorities can be substituted when the MOA is used elsewhere. The committee hopes that this MOA will receive wide distribution so that trustees and responsible parties will have had a chance to consider it prior to spills and thus be able to enter the cooperative process quickly and with assurance that a proven process is described within its four corners. The committee invites feedback on the document so that updates and improvements can be added and distributed. Correspondence can be directed to Grayson R. Cecil, 1200 Smith Street, Suite 1300, Houston, Texas 77002.

**COMMITTEE
FOR DEVELOPMENT OF
MODEL MEMORANDUM OF AGREEMENT
GOVERNING COOPERATIVE NRDA**

GOVERNMENT REPRESENTATIVES

Martin Steinmetz
Brian Cain
Steve Spencer
Allan M. Strand
US Department of the Interior

Ingrid Hansen
Diane Hyatt
Texas General Land Office

Craig O'Connor
Stephanie Fluke
Linda Burlington
National Oceanic & Atmospheric Administration

Don Pitts
Raenell Cox
Texas Parks & Wildlife Department

Richard Seiler
Greg Pfeifer
Texas Natural Resource Conservation Commission

INDUSTRY REPRESENTATIVES

Bea Stong
BT Consulting Group

Jim Scialabba
Marathon Oil Company

Michael Macrander
Ron Benton
Shell Oil Company

Jerry Hall
Texaco

Frank Gonynor
P&I Club Attorney
Eastham, Watson, Dale & Forney

Mark Cohen
P&I Club Attorney
Royston, Rayzor, Vickery & Williams, L.L.P.

William C. Bullard
P&I Club Attorney
Baker & Botts

Dan Allen
Chevron

Jerry Gallion
Kirby Industries

John Seddelmeyer
Exxon U.S.A., Inc.

Grayson R. Cecil
Cecil Consulting

MODEL AGREEMENT

MEMORANDUM OF AGREEMENT BETWEEN PARTIES GOVERNING COOPERATIVE NRDA AT OIL SPILLS

This Memorandum of Agreement (MOA) is among the [trustees] referred to as "Trustees," and the [Companies], referred to as "Companies." The Parties are hereafter collectively referred to as "the Parties." This MOA shall become effective as of the last date of its execution by the authorized representatives of the parties.

I. INTRODUCTION

On or about _____, 199_, (describe event, location, vessels involved, and date). As a result, a quantity of [name of product] was released into the waters of _____ (hereafter the "Incident"). This MOA is entered in recognition of the common interests of the Parties in determining whether natural resources have been or are likely to be injured as a result of the Incident and in providing a cooperative framework and funding to conduct activities to determine such effects, and in seeking expeditious restoration of affected natural resources.

II. PURPOSE

This MOA provides the terms by which the Parties agree to undertake a joint cooperative assessment of natural resource injuries and strategy for restoration (hereinafter "Assessment"). The National Contingency Plan at § 300.615(d)(2) provides the Parties the opportunity to reach negotiated agreements to obtain Company-financed or Company-conducted assessments. Also, the Texas Oil Spill Prevention and Response Act at § 40.17, the Texas Natural Resource Damage Assessment rules at 31 TAC § 20.23(b), and the OPA Natural Resource Damage Assessment Regulations (15 CFR Part 990) require the Trustees to invite Companies to participate in the Assessment process. The Assessment will include the development of a cost-effective and efficient Assessment plan to be jointly implemented by the Parties. The detailed study plans for this joint endeavor will be described in the Attachment(s). The Parties will seek to resolve issues relating to restoration of natural resources and their services without costly litigation.

III. TRUSTEE AUTHORITY

The Federal Trustees enter into this MOA in accordance with the legal authorities provided to each Federal Trustee by the FWPCA, OPA, CERCLA, Executive Order 12777 (10/22/91), the National Contingency Plan (40 CFR Part 300), the OPA Natural Resource Damage Assessment Regulations (15 CFR Part 990), and any other applicable laws or authorities. The State Trustees enter into this MOA pursuant to their designation by the Governor of Texas under CERCLA, OPA, OSPRA, and the Texas Natural Resource Damage Assessment Regulations, 31 TAC 20, and any other applicable laws or authorities.

IV. ASSESSMENT AND RESTORATION STRATEGY

The Parties are entering a cooperative process to identify a strategy for assessing natural resource injuries resulting from the Incident and for planning their restoration. The study plans for this process will be described in detail in attachments to this MOA and those attachments, when finalized and added, will be fully incorporated into this MOA and subject to all of its terms and conditions. The Parties agree to implement the strategy described in the attachments for the Assessment. The Parties stipulate that the plans for the Assessment described in any attachments to this MOA, both collectively and by individual component, represent appropriate scientific methodologies for determining the nature and extent of natural resource injuries and losses attributable to the Incident and for planning appropriate restoration based thereon. Disputes regarding the execution of the Assessment shall be governed by Paragraph VI.

Should the Parties agree that results of any individual component of the Assessment indicate a need to modify the budget, content, parameters, scope, or methodology of such component, the written modification shall be added as an addendum to the attachment describing the study plan to be modified. If agreement on pursuing such additional work is not reached and one Party wishes to pursue such additional work outside the scope of this MOA, such additional work shall be subject to the requirements of Paragraph VIII regarding individual Assessment studies.

If there is an additional release of oil attributable to the Incident or the extent of injury to trust resources otherwise changes after a study plan is attached to this MOA, the Parties agree to undertake a good faith effort to incorporate the new information into studies subject to this MOA. If agreement is not reached regarding the new information and any Party wishes to conduct additional studies outside the scope of this MOA, the additional studies shall be subject to the requirements of Paragraph VIII regarding individual Assessment studies.

V. PUBLIC PARTICIPATION

In compliance with applicable law, the Trustees will provide public notice and solicit public review and comment during certain phases of the Assessment process, including the assessment planning and/or restoration planning phases, and prior to finalizing any proposed settlement. In the event that the Parties have entered agreements under this MOA that propose activities subject to public notice, review and comment, the Parties agree that none of the activities shall be initiated until the appropriate notice, review, and comment requirements are fulfilled unless there is a scientific or technical necessity for proceeding prior to completion of the public notice and comment period. In cases of scientific or technical necessity, certain studies may go forward before and during the public notice, review, and comment process.

The Parties agree that they will work together and with the On-Scene Coordinator when appropriate to coordinate dissemination of information to the Public and, whenever possible and legally permissible, the Parties will permit joint statements or information releases. To the extent practicable, the Trustees will notify the Companies of any production of documents in response to requests under the Freedom of Information Act and the Texas Public Information Act.

Following completion of a proposed settlement agreement, the Trustees shall make such agreement available for public review and comment for a period of at least thirty (30) days. The Trustees may hold a public meeting to receive comments during the comment period. The parties agree that any such proposed settlement shall not be final until the comment period expires and all comments received have been duly considered and addressed by the Trustees. As required by applicable law, the Trustees shall enter all documentation developed for the Assessment into an Administrative Record to be made available to the public during review of the settlement agreement.

VI. CONDUCT OF THE ASSESSMENT STRATEGY

The Parties agree that all parties to this MOA will be given sufficient notice in advance of scheduling field work or other assessment activities and that all Parties may be present at any and all locations where work that is part of the Assessment described in Paragraph IV herein is being performed. The Parties stipulate that they will fully and freely share all data developed during the studies and, thereafter in accordance with Paragraph VIII, and the Parties' representatives shall have access to and use of all data collected during the period of this MOA. Any disputes rising from the execution of the study plans will be addressed by the Parties' representatives directly responsible for their formulation. Failure to resolve the dispute will end the joint cooperative assessment for that particular study which is the subject of the dispute. Written notice to all Parties is required defining the parameters of the work so excluded from the terms of this MOA.

VII. DISBURSEMENT OF FUNDS

Each attachment will describe a part of the Assessment and will contain a fully described and delineated budget for implementation. This budget will include trustee administrative costs for coordination of the Assessment. The Companies independently covenant to pay the Trustees in immediately available funds within thirty (30) working days the amount provided in the budget for any such attachment. The funds shall be disbursed or deposited in an appropriate manner for the Trustees' use solely to fund the study plans described in attachments hereto. Funds may not be transferred between studies without the written consent of all Parties. The Trustees will provide a full accounting of the expenditure of funds for each study. In addition, the Companies may designate a representative who will monitor spending for studies under this MOA. Funds and any accrued interest remaining at the conclusion of any study will be returned to the Companies. As prohibited by OPA, 33 U.S.C.A. § 2706(d)(3), nothing in this MOA shall be construed as permitting double recovery of funds provided by the Companies under this MOA in any claims arising from the Incident.

VIII. THE PARTIES INDEPENDENT FINDING AND RIGHTS

The Parties will use their best efforts to reach consensus on the interpretation of the data resulting from any study plan described in Paragraph IV and the attachments hereto. The Parties expressly reserve the right to disagree on the interpretation of the data resulting from any study and to produce separate and independent findings and conclusions.

The Parties expressly reserve the right to perform independent Assessment studies outside the scope of this MOA for potential use in the Assessment process. If such independent studies are undertaken by any Party, notice must be given to all Parties before independent studies are initiated. The conduct and implementation of such independent studies shall be in accordance with the data collection and sharing requirements of Paragraph VI of this MOA.

Other studies may also be undertaken by the Parties for purposes outside the scope of the Assessment and this MOA will have no applicability to such studies. The Parties agree that these studies will not be used in the Assessment process or any litigation involving the natural resource damage assessment claim without agreement of all Parties.

IX. RESERVATION OF RIGHTS AND CLAIMS

A. By entering into this MOA, the Parties agree that none of them is making any admission of fact or law. The MOA may be admissible as evidence in an action to enforce the MOA, but execution of the MOA itself, with or without supporting attachments, shall not be admissible as evidence or proof of liability or non-liability. Nothing in this MOA is to be construed to abrogate the right of any Party to pursue claims against or contribution from another Party. Nothing in this MOA is intended or shall be construed as a waiver by the Parties of defenses or affirmative claims in any proceedings relating to the Incident or of any other rights or remedies. Notwithstanding the foregoing language, nothing in this MOA precludes the Parties from agreeing otherwise in an amendment, modification, or attachment to this MOA or in a separate, independent document.

B. The Companies are not released from any potential liability, including but not limited to claims for damage, injury, loss, or destruction of natural resources or their uses, claims for the costs of assessing damage, injury, loss, or destruction of natural resources or their uses, claims for restoration or replacement of natural resources or lost uses of those resources, or any other causes of action or requests for relief, either administratively or judicially, under either state or federal law, as well as any claims, causes of action, or requests for relief in admiralty, arising from the releases described above.

C. The Trustees agree that no funds they receive from the Companies pursuant to this MOA will be used to fund any ongoing or continuing research project without agreement of all Parties.

X. SETTLEMENT NEGOTIATIONS

Upon completion of the Assessment, the Parties will use their best efforts to resolve any outstanding issues necessary for a final settlement. Any such negotiations and documents used in such discussions, whether a settlement is reached or not, shall remain completely confidential between the Parties, unless all Parties consent to release such information or unless the release of such information is required by law or compelled by court order.

XI. GENERAL

This MOA in no way affects or relieves the Companies of their responsibility to comply with any applicable federal, state, or local law, regulation, or permit.

XII. MODIFICATION AND TERMINATION

Any modification of this MOA or its attachment(s) must be in writing and executed by all of the Parties. Any party may terminate this MOA by giving thirty (30) days written notice to all Parties.

In the event that the Companies withdraw from further participation or their participation is terminated by the Trustees pursuant to the NRDA rules at 31 TAC 20.23(f), this MOA will automatically terminate. Notwithstanding any other provisions of this MOA, including Paragraph IX above, all stipulations shall survive the termination of this MOA for any reason.

XIII. NATURAL RESOURCE TRUSTEE AND COMPANY CONTACT PERSONNEL

This MOA establishes that [name agency(s)] will serve as the Lead Administrative Trustee(s) (LAT(s)) for this Incident. Duties of the LAT(S) include, but are not limited to, the following: scheduling of meetings between Parties; acting as the central point of contact for the Parties; maintaining records and documents relating to the damage assessment; and coordinating the preparation, issuance, or arrangement for public notices or reports as determined necessary by the Parties.

Each Trustee agency and the Companies hereby respectively designate the following person as their representative contact regarding this Incident:

[LIST OF CONTACTS]

XIV. EFFECTIVE DATE

This MOA may be executed in one or more counterparts, all of which shall be considered an original. The Effective Date of this MOA shall be the last date of execution of any counterpart hereto.

D.4 Draft Agreement among Trustees and RPs

I. INTRODUCTION

This Agreement is between [_____] (referred to as "trustees") and [_____] (referred to as "responsible party(ies)"). The trustees and responsible party(ies) are hereafter collectively referred to as the "Parties." This Agreement arises from the [_____] ("Incident").

The purpose of this Agreement is to provide the framework for a cooperative injury assessment to facilitate resolution of any natural resource damage claims arising from the Incident and to minimize the transaction costs associated with such claims. For the purposes of the Agreement, "injury assessment" is defined to encompass those activities related to the determination and quantification of injuries resulting from the Incident. Although this Agreement is drafted in terms of the injury assessment, the Parties also intend to explore the potential for continuing cooperative work throughout the development and implementation of a final restoration plan to resolve the natural resource damage claims arising from this Incident.

Signature on the agreement line provided below shall constitute acceptance by the Responsible Party(ies) and the Trustees. {Written concurrence is necessary to permit all Parties to continue the cooperative injury assessments already begun.}¹ The terms and conditions of this Agreement are as follows:

II. COOPERATIVE STUDIES

The Parties will attempt to reach consensus on the necessity of, selection of, design of, and protocols for performing studies relating to the injury assessment for the Incident.

- A. Process.** The Parties may propose studies. Any proposed study that all Parties agree is reasonable and appropriate shall be deemed a "Cooperative Study." The study plan for each Cooperative Study is or will be attached to this Agreement and will be subject to all of its terms and conditions.
- B. Funding.** The Responsible Party(ies) shall fund all Cooperative Studies through to completion unless the Parties agree to the contrary or the study design calls for discontinuation upon the occurrence of a specified event. The parties shall agree on specific procedures for disbursement of funds.

¹ This provision may be used when the Parties have begun cooperative work before the execution of this Agreement.

C. Retention of Persons Performing Cooperative Studies.

1. *Jointly Designated Experts.* In order to promote a cooperative injury assessment, the Parties may jointly agree on the retention of "Jointly Designated Experts" to perform all or part of a Cooperative Study. Prior to the completion of the Injury Assessment, any person designated as a Jointly Designated Expert shall not be retained separately by, and shall not otherwise perform services on behalf of, any Party, with respect to the Incident. The Parties may consult with such persons at scheduled meetings in which all the Parties shall have an opportunity to participate. Neither the Parties nor any persons retained by them shall engage in any *ex parte* communications (other than routine, non-substantive communications) regarding the Incident with Jointly Designated Experts, unless all Parties not party to the communication consent. Any and all contracts for Jointly Designated Experts shall prohibit any such *ex parte* communications. The Parties shall adopt such other reasonable strictures and controls as are appropriate to protect the objectivity and fairness of Jointly Designated Experts.
2. *Separately Retained Experts.* The Parties may separately retain experts relating to the incident. The Parties may elect to conduct one or more Cooperative Studies with the use of Separately Designated Experts. The Trustees may propose the use of their own Separately Retained Experts as part of a proposed Cooperative Study and may propose that the cost of such experts be funded by the Responsible Party(ies) as part of such proposal.

D. Data Collection. All parties may be present during data collection for Cooperative Studies. The parties agree to give advance notice by telecopy to the Study Contact (defined below) of data collection activities for Cooperative Studies. All data collected for Cooperative Studies shall be fully and freely shared among the Parties as soon after it is collected as is reasonably practical, and in any event no later than it is transmitted to any single Party.

E. Interpretation. The Parties will attempt to reach consensus on the interpretation of, and conclusions to be drawn from, data collected during Cooperative Studies. Each Party expressly reserves the right to produce and present separate and independent interpretations and conclusions.

F. Modification of Cooperative Studies. The Parties may agree to modifications of study plans for Cooperative Studies. The Study Contact designated by the Trustees pursuant to Paragraph VIII.B. may agree to modifications on behalf of all of the Trustees.

- G. Withdrawal from Cooperative Studies.** The Responsible Party(ies) shall not withdraw from its obligation to fund a Cooperative Study so long as the study is conducted consistently with the agreed study plan and any agreed modifications thereto.
- H. Use.** Unless advance written consent is provided by all Parties, Cooperative Studies shall be used only as part of this overall cooperative injury assessment, and in an effort to achieve a negotiated settlement of the natural resource damage claims arising from the Incident. The Parties agree that any result in a Cooperative Study that is not challenged by such Party in writing within 30 days of receipt of the final report shall be binding upon such Party in any judicial or administrative proceeding between or among the Parties relating to the natural resource damage claims arising from the Incident. The Parties also agree that the final results of any Cooperative Study, including interpretation, shall be admissible in any judicial or administrative proceeding between or among the Parties relating to the natural resource damages arising from the Incident, regardless of whether any Party has challenged such results. The Parties further agree not to challenge the reasonableness or appropriateness of the study designs or protocols of any Cooperative Study in any such proceeding. The Parties reserve the right to challenge the admissibility of Cooperative Studies in any judicial or administrative proceeding other than one for natural resource damages arising from the Incident.
- I. Subsequent Use of Experts.** Any Party may call a Jointly Designated Expert as a witness in any judicial or administrative proceeding relating to natural resource damages arising from the Incident, to testify regarding the conduct of, and conclusions reached, in performing such study. In addition, any Party may seek to retain, as a testifying or consulting expert, any Jointly Designated Expert, and no Party shall object to the retention or testimony of such person on the basis of such person's prior participation as a Jointly Designated Expert.

III. INDEPENDENT STUDIES

The Parties expressly reserve the right to perform independent injury assessment studies ("Independent Study(ies)").

- A. Notice.** At least ___ days prior to the commencement of any Independent Study conducted by or on behalf of a Party, such Party shall provide detail work plans and protocols for such Independent Study to the other Parties. The Parties shall also provide prompt notice of any changes made to the scope of work of any Independent Study in progress.

- B. Data Collection.** All Parties may be present during data collection for Independent Studies. The Parties agree to as reasonable advance notice as circumstances allow of data collection activities for Independent Studies. All data collected for Independent Studies shall be fully and freely shared among the Parties as soon after it is collected as is reasonably practical, and in any event no later than it is transmitted by the analyst to the Party sponsoring the Independent Study.
- C. Final Reports.** Any Party conducting an Independent Study shall provide copies of any final report relating to such study within 7 days of its completion.
- D. Use.** The Parties agree and stipulate that failure to comply with the requirements of Sections II.A. and II.B. with respect to any Independent Study shall result in a bar to the admissibility and use of any such Independent Study in any judicial or administrative proceeding between or among the Parties for natural resource damages relating to the Incident.

IV. REFUSED STUDIES

The requirements, prohibitions, and limitations and agreements of Sections II.B. through II.D. shall not apply to any study proposed by the Trustees for funding as a Cooperative Study that the Responsible Party(ies) refuses to fund, and that the Trustees undertake at their own expense ("Refused Study").

V. NON-PARTY STUDIES

A "Non-Party Study" is any study that was not conducted directly or indirectly by, on behalf of, or with the input of any of the Parties. Agencies of Federal, State, or tribal Government other than the Trustees are not Parties to this agreement for purposes of this definition. The Parties reserve the right to use Non-Party Studies in any judicial or administrative proceeding, and to object to such use.

VI. DISCLOSURE OF EXPERTS/CONFLICTS OF INTEREST

The Parties agree that they will identify any outside experts that they intend to retain with respect to natural resource injury assessment (for purposes of giving testimony, conducting studies, or otherwise), including Separately Retained Experts as described in Paragraph I.C.2. above, at least 7 days prior to formalizing such retention or, in the case of experts already retained, within 3 days of signing this Agreement. The Parties agree that they will require the disclosure of potentially conflicting relationships by the experts as part of their employment, which disclosed information shall be shared among all Parties, and further agree to require in all contracts for expert services reasonable and appropriate strictures and controls to prevent the transfer of confidential information.

VII. DISPUTE RESOLUTION

The Parties may jointly designate a mediator or special master, with expertise in natural resource damage actions, for assistance in resolving disputes over issues upon which the Parties cannot agree. Such involvement by the designee shall not result in any final or binding decision on any such issue, but rather shall be in the form of mediation assistance to help the Parties reach mutual agreement on such disputed issues. The costs for any such mediator or special master shall be shared equally between the Trustees and the Responsible Party(ies).

VIII. PUBLIC PARTICIPATION

In compliance with applicable law, the Trustees will provide public notice and solicit public review and comment during certain phases of the injury assessment process, including the assessment planning and/or restoration planning phases, and prior to finalizing any proposed settlement. In the event that the Trustees and the Responsible Party(ies) have entered agreements that propose activities subject to public notice, review, and comment, the Parties agree that none of the activities shall be initiated until the appropriate notice, review, and comment requirements are fulfilled unless a time-sensitive or emergency situation exists. In such cases, certain studies may go forward pending the public notice, review, and comment process.

IX. NOTICE

A. General. Except as provided in Paragraph VIII.B. below, Notice under this Agreement shall be given to the following persons on behalf of the Parties:

1. *As to the Responsible Party(ies):*

2. *As to the individual Trustees:*

_____, etc.

B. Study Contacts. The Trustees shall jointly designate a single Study Contact for each Cooperative Study who shall be authorized to act on behalf of all of the Trustees with respect to that particular Cooperative Study.

X. MODIFICATION

This Agreement may be modified or supplemented through appendices upon agreement in writing by all Parties.

This Agreement may be executed in one or more counterparts, all of which shall be considered an original. The Effective Date of this Agreement shall be the latter date of execution of any counterpart hereto.

The Parties to date have acted in good faith, to the Parties' collective benefits, and look forward to continuing to work among themselves under the framework set forth above.

FOR THE RESPONSIBLE PARTY(IES)

Name

Date

FOR THE TRUSTEE(S)

Name

Date

Table of Contents

E.1 NRDA Sampling Team	E-1
E.2 On-Scene Assessment	E-6
E.2.a Data Collection and Analysis Activities.....	E-6
E.2.b Aerial Reconnaissance.....	E-8
E.2.c Ground Reconnaissance Studies	E-9
E.3 Chemical Sampling.....	E-11
E.3.a Objectives	E-11
E.3.b Chemical Sampling Methods	E-12
E.3.b.1 Environmental Samples for Fingerprint Analysis	E-12
E.3.b.2 Collection of Water Samples.	E-12
E.3.b.3 Collection of Sediment Samples	E-13
E.4 Toxicity Testing.....	E-15
E.4.a Objectives	E-15
E.4.b Methods.....	E-16
E.5 Biomarkers	E-16
E.5.a Exposure Indicators	E-22
E.5.b Response Indicators	E-23
E.6 Ecological Sampling.....	E-24
E.7 Data Collection on Recreational Participation.....	E-24
E.7.a Objectives	E-24
E.7.b Methods.....	E-25
E.7.b.1 Determination of Closures.....	E-26
E.7.b.2 Determination of Locations of Recreational Activity.....	E-26
E.7.b.3 Availability of Use Level Data	E-26
E.7.b.4 Assessment on Potential Injury Levels	E-27
E.8 Data Collection to Assess Navigational Effects	E-27
E.8.a Objectives	E-27
E.8.b Methods.....	E-27
E.9 References	E-28

E.1 NRDA Sampling Team

The composition and size of the team involved in data collection and analysis during the Preassessment Phase will vary according to the complexity of the oil spill incident. For incidents where a moderate to large effort is required for preassessment activities, the following specific core team members are usually needed, either on-scene or as support staff to the field team:

- Trustee Agency Coordinator (from all of the trustees)
- Natural Resource Biologist (for each of the major resources/habitats affected by the incident)
- Environmental (Petroleum) Chemist
- Natural Resource Economist
- Restoration Expert
- Administrative Specialist
- QA Specialist
- Data Manager/Sample Custodian
- Statistician
- Natural Resource Attorney

The responsibilities of each core team member are discussed below.

Trustee Agency Coordinator: The trustee coordinator must be an agency employee who has the authority to represent the trustees. Responsibilities include:

- Attend trustee meetings;
- Represent trustee responsibilities at meetings;
- Determine the potential for effects to trust resources and services;
- Organize trustee meetings and involvement when lacking;
- Evaluate the adequacy of current NRDA activities; and
- Recommend activation of additional team members.

Natural Resource Biologist: Responsibilities include:

- Develop familiarity with the local habitats and biological resources;
- Determine the natural resources potentially at risk;
- Assist in developing consensus among trustees on natural resources and services at risk and objectives of data collection plans;
- Design and implement necessary and relevant data collection activities and implement sampling and testing programs;
- Identify data gaps in current NRDA activities; and
- Determine need for specialized or local experts and guide work of experts along NRDA requirements.

Environmental (Petroleum) Chemist: Responsibilities include:

- Evaluate the chemical fate and effects of the discharged substance and use this information in the development of appropriate data collection plans;
- Review and update plans for collection and processing of chemical samples; and
- Evaluate or specify the proposed analytical protocols, reviewing the protocols of the selected laboratory to determine their ability to meet the data quality requirements.

Natural Resource Economist: Responsibilities include:

- Assist in developing consensus among trustees on resource services at risk and objective of related data collection plans;
- Provide expertise on the breadth of natural resource services;
- Conduct scaling of various restoration actions;
- Conduct the other economic components of the damage assessment; and
- Work closely with the core team members to determine the appropriate assessment method and ensure that the assessment is addressing the issues of greatest importance to the damage assessment.

Restoration Expert: Responsibilities include:

- Collect information on restoration alternatives;
- Identify the types of studies needed to support selection of restoration alternatives;
- Initiate the development of the restoration plan; and
- Develop monitoring plans and project activities related to restoration planning and implementation.

Administrative Specialist: The information specialist is an incident-specific, on-site role rather than a member of the planning team. Responsibilities include:

- Collect reports, write minutes of meetings, and file technical and response data in an organized manner with full documentation;
- Make sure that all NRDA meetings have prepared minutes;
- Prepare a Daily Activities Log for the record; and
- Process contracts and other financial needs to facilitate progress relative to the incident.

QA Specialist: Responsibilities include:

- Review/update QA protocols for all data collection activities; and
- Make sure that sampling activities follow QA protocols.

Data Manager/Sample Custodian: Although many of the tasks conducted by the data manager are part of QA, an on-site person should be assigned these operational responsibilities, which include:

- Develop a consistent database on NRDA sampling efforts (i.e., who, what, where);
- Track sample chain-of-custody forms;
- Review and approve data forms;
- Responsibility for receiving, properly storing, and shipping samples; and
- Prepare and deliver a complete file on the incident to the trustees, with an electronic index or reference list.

Statistician: Responsibilities include:

- Be familiar with all types of environmental data analyses including parametric and nonparametric statistics and multi-variate techniques;
- Have a practical understanding of field sampling methods and issues;
- Design statistically sound sampling strategies; and
- Monitor implementation of the sampling strategy and suggest changes when needed.

Natural Resource Attorney: Responsibilities include:

- Provide analysis of legal considerations in the NRDA;
- Play a key role in representing trustees to the RPs;
- Provide analyses of past NRDA cases;
- Draft agreements among the trustees and between the trustees and RPs; and
- Provide legal advice to the trustees throughout the NRDA process.

Depending on the conditions of the incident, specialized technical experts may be needed on the NRDA team at the very beginning. These technical experts can contribute to the early effort of the team remotely by telecommunications and provide recommendations (e.g., methodologies, etc.) or go on-scene and direct the activities themselves.

One person can take on multiple roles, depending on the scale and phase of the NRDA response. Initially, at least two team members are needed to go on-scene to evaluate the incident conditions, collect the information needed to determine the level of response, and prepare a preliminary sampling strategy. One of these members should include the information specialist. Other team members and experts can be mobilized as needed.

E.2 On-Scene Assessment

In order to conduct preassessment activities, for most oil spill incidents, the trustees may need to go on-scene to collect pertinent data. The presence of the trustees is necessary because so much information is generated and exchanged verbally on-scene among responders or is incompletely documented.

E.2.a Data Collection and Analysis Activities

Once the trustees arrive on-scene, the first objective is to survey and document the nature and extent of injury to natural resources and services, and identify those resources and services that may be affected in the future. There are several tasks that need to be completed as part of preassessment. These tasks include:

- Collection and assessment of readily available information on the type, amount, characteristics, location, and predicted trajectory of the discharged oil;
- Development of an abbreviated data collection plan for the NRDA response;
- On-scene assessments of the incident, through reconnaissance surveys and on-site inspections of areas that may be affected;
- Development and implementation of a more detailed data collection and analysis plan for early sampling to determine the potential exposure and injuries of natural resources and services; and
- Documentation and reporting requirements.

Exhibit E.1 includes a checklist for NRDA trustees to refer to during the first few days of the on-scene data collection activities. This checklist is not all-inclusive, but should be used as a guide for the types of issues addressed. Further, NOAA has prepared an Emergency Procedures Manual (NOAA, 1994), which provides guidance to NRDA teams on early sampling activities during oil spill incidents.

- Obtain a briefing on the status of the incident from the OSC or SSC at the Command Post. Get updated information on the incident, potential discharge amount, response actions, trajectory of the discharge, and weather conditions that might affect discharge conditions, etc
- Evaluate the site safety issues. Obtain a copy of the site safety plan, if available.
- Establish a filing system and begin filing all documents.
- Obtain copies of local charts and topographic maps of the incident area. Make photocopies of the incident site for recording information during overflights and ground surveys.
- Obtain copies of any and all reports (e.g., pollution reports, Hotline, operational summaries), maps, and trajectories on the discharge from the Command Post, newspaper articles, press releases, response plans, etc.
- Obtain a briefing on the natural resources and services at risk, reports on effects to-date, and names of contacts for the resource agencies involved in the response. Identify all response activities by resources agencies.
- Get on an overflight as soon as possible. Bring maps or charts, camera and/or videocamera, overflight checklist, and necessary safety equipment. Take sufficient photographs; keep a detailed photolog.
- Ship in supplies and response kits that may be needed.
- Check contents of kits and determine need for supplemental equipment and supplies (e.g., film, batteries, videotapes, more sampling jars, cleaning and preservation chemicals, etc.).
- Get tide schedules.
- Develop an initial data collection plan, including samples from the source.
- Determine schedule of daily meetings so that the appropriate people attend.
- Establish a NRDA work area. Rent cellular phones. Distribute names/phone contacts for the team.
- Determine need for contractor support.
- Develop an early data collection plan to collect data on oil effects to natural resources and services, making sure to coordinate with response activities. Identify baseline and reference/control conditions.
- Form NRDA teams to implement the sampling plans. Make sure everyone on the teams has appropriate safety gear and training.
- Make sure that maps showing the distribution of the discharge over the area and time are generated in a systematic manner.
- Make sure that there are written QA protocols for data collection and that these protocols are understood by all NRDA team members.
- Distribute copies of reports on natural resources and services at risk and sampling plans to home offices.
- Evaluate the need for experts. Identify potential experts as needed.
- Brief SSC and other operational responders on NRDA activities.
- Generate lists of names, phone contacts, and activities for all persons involved with data collection.
- Review OPA Fund procedures.
- Consider emergency restoration actions.
- Implement documentation procedures by distributing forms for field observations, chain-of-custody, photo logs, daily activities reports, etc.
- Coordinate with biological rescue and rehabilitation groups to make sure that detailed documentation of number, species, and fate of animals is kept.
- Keep track of shoreline, waterway closures, and seafood safety procedures.
- Consider damage assessment options.

Exhibit E.1 Checklist of preassessment activities for NRDA trustees.

The trustees should develop an early study plan for collecting necessary and relevant data on the natural resources and services that may be affected. This plan will be used in the Preassessment Phase to select the type of damage assessment to conduct. The plan should clearly state: the objectives of the study; which natural resources and services are to be studied; the type of samples that are to be collected; the frequency of sampling; and the type of analysis anticipated. Each study plan will be unique for the current incident conditions and must have the flexibility to incorporate new objectives as the on-going incident conditions change. The plan should be written and distributed to the other trustees for their approval and participation.

E.2.b Aerial Reconnaissance

The initial identification of areas potentially affected is usually conducted through aerial reconnaissance. During reconnaissance, documentation of the extent of the incident is very important for establishing monitoring stations and baseline conditions. This information is not always routinely collected by the response team at the scale, frequency, or detail required for later analysis under NRDA.

Aerial surveys allow an extremely rapid assessment of the entire incident site and are especially useful in determining the relationship between local geomorphology and contaminant distribution as well as the areal extent of effects (e.g., heavy accumulations of oil in east-facing pocket beaches, oil sheens in backwater lakes along a river). Inflight observations are recorded both orally on audio tape and photographically with a hand-held 35 mm camera or a videocamera preferably both. The best altitude for observations is between 500 and 1,500 feet. Either a helicopter or fixed-wing (i.e., high-wing) aircraft may be used.

Primarily, the overflights are conducted to determine the extent of contamination or habitats that may be contaminated, and observe biological resources and services highly susceptible to future effects.

Some important guidelines for conducting a safe and productive overflight are outlined below:

- Learn the communications protocol in the aircraft (i.e., when not to talk, who is directing the pilot, and how to communicate your objectives and plans);
- Go over the flight plan with the pilot. Have a map of the flight plan sketched out, if possible;

- Always have your own maps and know the area surveyed;
- Keep track of your location and elevation;
- Plot your flight path on your map, noting the time every 30 minutes or when you change direction;
- Make detailed observations of affected natural resources or the proximity of natural resources (e.g., biological, habitat, etc.) and services (i.e., ecological and public) relative to the incident;
- When mapping oil onshore, carefully locate yourself with land features. Use detailed respirators for contaminant type, coverage, dimensions, behavior (e.g., sheening, refloating, or lack thereof). Draw directly onto the map. Note the presence of response workers, locations and estimates of number of biota by species, and observations on position of the oil relative to natural resources and services. Use a pre-determined code for describing oil type (e.g., mousse, black oil, rainbow sheen, etc.) and coverage. Exhibit E.2 contains recommended terminology for oil descriptions and terms;
- Immediately after returning to the Command Post or base of operations, transfer your observations to a worksheet and a clean copy of a map while the information is still fresh; and
- If photographs are taken, check your photo log and make sure it is completed. Identify the location of all photos on the map as they are taken to create an accurate record of the overflight.

E.2.c Ground Reconnaissance Studies

Once the overflight is complete, ground surveys are needed to groundtruth the aerial observations and collect samples. These ground surveys are conducted with the realization that future monitoring studies may be established in some of these areas, so detailed records should be made of all observations.

<u>Shoreline Slope</u>			<u>Shoreline Zone</u>	
Low	Less than 30 degrees		SU	Supratidal (above normal spring high tide levels)
Medium	Between 31 and 60 degrees		UI	Upper Intertidal
High	Between 61 and 90 degrees		M	Middle Intertidal
Vertical	Vertical or near vertical		LI	Lower Intertidal
<u>Oil Category Width</u>			<u>Sediment Type</u>	
W	Wide	> 6 m wide	R	Bedrock outcrops
M	Medium	>3m to <6m		
N	Narrow	> 0.5 m to < 3 m	B	Boulder (>256 mm in diameter)
V	Very Narrow	≤ 0.5 m	C	Cobble (64-256 mm)
			P	Pebble (4-64 mm)
			G	Granule (2-4 mm)
<u>Oil Distribution</u>			S	Sand (0.06-2 mm)
C	Continuous	91 - 100%	M	Mud (silt and clay, < 0.06 mm)
B	Broken	51 - 90%	RR	Riprap (man-made permeable rubble)
P	Patchy	11 - 50%	SW	Seawalls (impermeable)
S	Sporadic	1 - 10%		
T	Trace	<1%		
<u>Surface Oiling Descriptors - Thickness</u>				
PO	Pooled Oil (fresh oil or mousse > 1 cm thick)			
CV	Cover (oil or mousse from >0.1 cm to <1 cm on any surface)			
CT	Coat (visible oil <0.1 cm, which can be scrapped off with fingernail)			
ST	Stain (visible oil, which cannot be scrapped off with fingernail)			
FL	Film (transparent or iridescent sheen or oily film)			
<u>Surface Oiling Descriptors - Type</u>				
FR	Fresh Oil (unweathered, liquid oil)			
MS	Mousse (emulsified oil occurring over broad areas)			
TB	Tarballs (discrete accumulations of oil <10 cm in diameter)			
PT	Patties (discrete accumulations of oil >10 cm in diameter)			
TC	Tar (highly weathered oil, of tarry, nearly solid consistency)			
SR	Surface Oil Residue (non-cohesive, heavily oiled surface sediments, characterized as soft, incipient asphalt pavements)			
AP	Asphalt Pavements (cohesive, heavily oiled surface sediments)			
NO	No Oil			
DB	Debris; logs, vegetation, rubbish, garbage, response items such as booms, etc.			
<u>Subsurface Oiling Descriptors</u>				
SAP	Subsurface asphalt pavement (cohesive)			
OP	Oil-Filled Pores (pore spaces are completely filled with oil, to the extent that the oil flows out of the sediments when disturbed). May also consist of weathered oil such as a buried lens of asphalt pavement			
PP	Partially Filled Pores (pore spaces partially filled with oil, but the oil does not flow out of the sediments when disturbed)			
OR	Oil Residue (sediments are visibly oiled with black/brown coat or cover on the clasts, but little or no accumulation of oil within the pore spaces)			
OF	Oil Film (sediments are lightly oiled with an oil film, or stain on the clasts)			
TR	Trace (discontinuous film or spots of oil, or an odor or tackiness)			
NO	No Oil (no evidence of any type of oil)			
<u>Sheen Color</u>				
B	Brown			
R	Rainbow			
S	Silver			
N	None			

Exhibit E.2 Shoreline oil terminology/codes.

When physically visiting exposed sites or potentially affected areas, the trustees should record the extent of effects (i.e., discharge distribution, percent coverage, zone of coverage, etc.), create visual records of the sites (i.e., photographs, video records, field sketches, oral descriptions on tape, etc.), collect samples as needed, and identify areas that may serve as likely baseline and reference/control sites. Systematic documentation of observations is extremely important. Exhibit E.2 includes recommended terminology and codes for use in shoreline surveys. Detailed guidance can be found in the Emergency Procedures Manual (NOAA, 1994), which provides guidance to NRDA teams on early sampling activities during incidents. Methods for systematic shoreline surveys are also described in Owens (1991) and Debusschere et al. (1992).

Hand-held Global Positioning System (GPS) units make sample location easy to determine and record. GPS is a satellite positional and navigation network, which allows determination of a position fix within tens of meters.

E.3 Chemical Sampling

E.3.a Objectives

Stating a clear objective often seems so obvious that it is not explicitly mentioned by investigators considering sampling projects. However, it is frequently the case that objectives are not well formulated, leading to inconclusive results. With clearly stated objectives, the trustees can be confident in the design and implementation of data collection and analysis plans. During preassessment activities, chemical samples are collected primarily to answer the following basic questions:

- Is this oil the same as the oil that was discharged?
- What is the concentration of the oil in the media being sampled?
- What is the composition of the oil in the media being sampled?

The quality of the results obtained from the sample analysis is directly related to:

- Collecting representative samples;
- Using appropriate sampling techniques; and
- Properly preserving the samples until they are analyzed.

E.3.b Chemical Sampling Methods

E.3.b.1 Environmental Samples for Fingerprint Analysis

Samples for fingerprint analysis are collected to answer the question “Is this oil the same as the oil that was discharged?” Consequently, such samples do not have to be quantified or related to a measured amount of sample. Fingerprint samples are grab samples, not composites. They are compared with a “source” sample, preferably one carefully collected directly from the original container (i.e., vessel, pipeline, tank) and not from floating slicks or stranded oil. The following techniques are used to collect thin sheens -- for offshore, a special sheen sampler composed of teflon strips on a line is pulled through the sheens, -- for nearshore, teflon filter papers are used to pick up small sheens (Henry, 1993). In all cases, special care is taken to prevent contamination with sheens from the exhaust of boat motors or washing off the sides of the sampling platform. Samples for fingerprinting can also include tarballs, oiled sediments, oiled animal parts (i.e., preferably fur/feathers), and oiled vegetation. Biological samples are collected in glass jars or aluminum foil and kept frozen until analysis. Sample containers, sample volumes, and holding times are listed in Exhibit E.3. All lids should be aluminum- or teflon-lined, not plastic.

E.3.b.2 Collection of Water Samples

Water samples are very difficult to collect where surface oil slicks are present. When sampling in areas covered by a surface slick, extreme care is needed to “knock” the surface slick aside so that the sampling device can be lowered into the water without becoming contaminated. Water samples should be collected directly in the sample container, since oil droplets readily adhere to the inside of most samplers. For shallow water samplers, it is necessary to wade into the water or lean over from a platform to collect the sample. The container is opened, allowed to fill, and closed at the desired water depth. Deeper water samples have to be collected by lowering the sampling container to the desired depth and remotely opening and closing the container at that depth. Under most conditions, concentrations in the water will be very low and the potential for contamination is high. Additionally, surface slicks and the water-accommodated fraction track differently. Therefore, the presence of oil on the water surface is not always an appropriate criterion for collection of water-column samples.

Depending on the analytical method used, minimum sample volumes range from one liter to one gallon. With replication, the volume of water shipped to the laboratory can be significant. Ideally, water samples should be stored no longer than eight hours, although, if they are kept cold (4°C) and dark, water samples may be stored for as long as five days. Background samples should be collected well away from any oiled areas, being careful not to sample along the vessel path or near any boat or aircraft engines, to reduce the chance of contamination.

E.3.b.3 Collection of Sediment Samples

Sediment samples are collected from two general settings; surface sediments (i.e., terrestrial soils and intertidal sediments), which are readily visible and collected by hand and subtidal sediments, which are usually sampled with a remote sampling device. Intertidal surface sediments and soils are relatively easy to sample since variability in the sediment type and degree of contamination can be readily discerned and described. Two of the most difficult issues in sediment sampling at oil discharges are:

- Collection of a representative sample where there is extreme variability in the amount of oil. On an oiled marsh, the contamination will range from oil pooled on the surface to patches adjacent to visibly clean sediments. This problem is even more difficult where the sediments are coarse (i.e., in the range of pebbles to cobbles) and where the natural variability is compounded by the size of the material compared to the sampling container. One approach is to composite subsamples, but this approach does not facilitate statistical analysis of the variability at a site.
- Prevention of cross contamination when moving between heavily contaminated sites and clean sites. Keeping sampling equipment and supplies clean between sites at an oil discharge is very difficult. The only guarantee against cross contamination is to use new, clean utensils at every sampling site. On-site cleaning of utensils or corers is not recommended. Blanks are extremely important to collect, particularly at the cleaner sites.

Detailed descriptions and photographs of the samples and site are needed. Photoscales are always used when photographing sediment sampling sites. Documentation includes both overview and close-up photographs. To determine oil penetration with depth, trenches are dug, described, and photographed. Grain-size estimators (i.e., field guides that visually show grain-size classes) are used to describe sediment textural parameters. Standard oil descriptors are used to characterize the type and degree of contamination. Sampling site locations are shown on detailed field sketches or maps.

Exhibit E.3 Sample requirements for discharges of oil.

Oil Analysis	Quantity	Storage	Other Conditions
Fingerprinting slick or tarball samples.	> 100 ml	Precleaned glass jars or aluminum foil	Kept cold or frozen until delivered to the lab.
Fingerprinting source samples	~ 1 gallon	Precleaned glass containers	Kept cold or frozen until delivered to the lab.
Weathering source samples	~ 1 liter	Precleaned glass jars	Kept cold or frozen until delivered to the lab.
Water Samples	~ 1 gallon	Super-clean glass containers	Kept cold and dark for less than 8 hours. Preservation of sample may be done — check with analytical lab.
Sediment Samples, Fingerprinting	100 grams	Precleaned glass jars or aluminum foil	Extreme care should be taken to prevent sample contamination. Kept cold or frozen until delivered to the lab.
Sediment Samples, Total Petroleum Hydrocarbons	100 grams	Precleaned glass jars or aluminum foil	Composite subsamples, 10-15 samples from site. Kept cold or frozen until delivered to the lab.
Sediment Samples, Grain Size	50-100 grams	Ziploc or whirl-pak bags	No special conditions required.

Subtidal or bottom sediment samples pose a different set of problems mainly because they require use of sampling devices deployed from a boat or diver-held corers. Samplers that take box cores with minimal disturbance of the surface are the preferred device because most of the contamination in the first few weeks is likely to be on the sediment surface. Box corers also allow ready collection of replicates or composites at a site. Cleaning of the sampling device is a second problem, especially when the sediment contamination levels are high. Soap and water, scrub brushes, large volumes of clean water, and solvent rinses are needed to clean the sampling device between stations. Collection of the waste solvent for disposal must also be addressed. It is important to record water depth, time of collection (i.e., so depth can be corrected to mean sea level in tidal waters), sediment description, visible oiling conditions, depth of bioturbation, presence of oxidized and reduced zones, and presence and relative density of invertebrates. The sediment surface should be photographed prior to collection from the corer.

Samples of approximately 100-200 grams (i.e., approximately one cup) are usually sufficient. The data collection plan should specify the sample intervals and depths. All samples should be numbered uniquely. It is important to have preassigned numbering series for samples when multiple teams are in the field collecting samples. Samples are collected with clean metal utensils or wooden tongue depressors and placed in precleaned glass jars with teflon-lined caps.

E.4 Toxicity Testing

E.4.a Objectives

Toxicity tests are used to determine whether discharged oil and its degradation by-products have measurable effects on the biota potentially exposed during an incident. When combined with field surveys documenting direct effects in the field, toxicity data establish the link between the incident and ecological responses (Parkhurst et al., 1989). The objectives of toxicity tests are to correlate an adverse ecological response with exposure to the discharged oil and determine the concentrations at which response occurs for the species of concern. Toxicity test results can be used in preassessment as a screening tool to indicate potential biological effects and whether further bioassessment studies are needed.

There are two approaches to determine toxicity of a substance, the *toxicity-based approach*, which directly measures the biological effect resulting from exposure to the contaminated pathway from the incident site, and the *chemistry-based approach* which uses chemical analyses and laboratory-generated criteria (e.g., LC50 values) to estimate toxicity (Parkhurst et al., 1989). Both of these approaches are complementary and may be used for quantifying toxicity of water and sediments contaminated by a discharge of oil.

E.4.b Methods

The following toxicity tests are examples of those suitable for use in preassessment. There are many more that may be appropriate for specific discharge conditions. While the most commonly measured endpoint is death or immobility of the organisms, other endpoints frequently measured include changes in reproduction, growth, development, and behavior.

The toxicity tests listed in Exhibit E.4 are representative of commonly used types of standardized tests. As long as accepted protocols are followed, there is the potential for establishing local or regional test protocols with endemic species or species of concern.

E.5 Biomarkers

Biomarkers are direct biological measurements used to quantify the degree of exposure or response to the contaminant (Hunsaker and Carpenter, 1990). More specifically, biomarkers are "...biochemical, physiological, or histological indicators of either exposure to, or effects of, xenobiotic chemicals at the suborganismal or organismal level" (Huggett et al., 1992). There are two types of biological indicators, exposure and response indicators. Exposure indicators establish that organisms were subjected to a potentially deleterious stressor and quantify the extent of that exposure. However, exposure indicators cannot be used to detect deleterious effects. In contrast, response indicators demonstrate that deleterious effects are occurring, although often it is difficult to link the cause of the effect to exposure to the discharged oil. Thus, in most instances, both response and exposure indicators are needed to establish that effects are occurring and link the cause of those effects to oil exposure. Biomarker tests currently applied to specific groups of organisms are listed below (MacDonald et al., 1992):

Mollusks	Mixed function oxygenase (MFO) enzymes Binding proteins Neoplasms Lesions and other histopathological disorders Growth reduction
Fish	Mixed function oxygenase (MFO) enzymes Binding proteins Lesions and other histopathological disorders Deoxyribonucleic acid (DNA) adducts Skeletal defects Polycyclic aromatic hydrocarbon (PAH) metabolites in bile Reproductive measures
Birds/Marine Mammals	Mixed function oxygenase (MFO) enzymes Reproductive measures Lesions and other histopathological disorders

Exhibit E.4 Freshwater, and marine and estuarine toxicity tests.

Test	Endpoint	Duration	Reference
<u>Freshwater</u> <u>Water Column</u> <u>Acute Toxicity Tests</u> LC_{50} , EC_{50} , <u>or</u> IC_{50} Fish - Rainbow trout (<i>Oncorhynchus mykiss</i>) - Coho salmon (<i>O. kisutch</i>) - Brook trout (<i>Salvelinus fontinalis</i>) - Fathead minnow (<i>Pimephales promelas</i>) - Bluegill (<i>Lepomis macrochirus</i>) - Goldfish (<i>Carassius auratus</i>) - Channel catfish (<i>Ictalurus punctatus</i>) - Green sunfish (<i>Lepomis cyanellus</i>)	survival	2 to 8 days	APHA, 1989; ASTM, 1992 USEPA, 1985 ASTM, 1992 ASTM, 1992 ASTM, 1992; USEPA, 1985 ASTM, 1992; USEPA, 1985 ASTM, 1992 ASTM, 1992 ASTM, 1992
Invertebrates - Daphnids (<i>Daphnia</i> sp.) - Water flea (<i>Ceriodaphnia dubia</i>) - Amphipods (<i>Gammarus</i> sp.) - Crayfish (<i>Orconectes</i> sp., <i>Cambarus</i> sp., <i>Procambrus</i> sp., <i>Pacifastacus leniusculus</i>) - Mayflies (<i>Hexagenia</i> sp.) - Midges (<i>Chironomus</i> sp.) - Snails (<i>Physa</i> sp. and <i>Amnicola limosa</i>)	immobilization and/or survival	2 to 8 days	ASTM, 1992; USEPA, 1985

APHA = American Public Health Association

ASTM = American Society for Testing and Materials

PSEP = Puget Sound Estuary Program

USEPA = U.S. Environmental Protection Agency

Freshwater (continued) <u>Chronic Toxicity Tests</u> <u>Early Life Stage Toxicity Tests</u> Fish - Salmonids - Fathead minnow - White sucker (<i>Catostomus commersoni</i>) - Channel catfish - Bluegill - Striped bass (<i>Morone saxatilis</i>)	survival/ abnormal development survival/growth survival/growth survival/growth survival/growth survival/growth	30 days post swim-up 32 days 32 days 32 days 32 days 45 days	ASTM, 1992
<u>Life-Cycle Tests</u> Invertebrates - <i>Ceriodaphnia dubia</i> partial-life cycle test - <i>Daphnia magna</i> life-cycle test	survival/ reproduction	7 days 21 days	USEPA, 1989 USEPA, 1989
Algal Growth Test - <i>Selenastrum capricornutum</i>	growth	96 hours	USEPA, 1985
<u>Sediment (Sediment Elutriate)</u> Invertebrates - Amphipod (<i>Hyalella azteca</i>) - Midge (<i>Chironomus</i> sp.)	survival/growth survival/growth	10 days 10 days	ASTM, 1992

Marine and Estuarine Water Column <u>Acute Toxicity Tests LC₅₀, EC₅₀, or IC₅₀</u> Fish - Sheepshead minnow (<i>Cyprinodon variegatus</i>) - Mummichog (<i>Fundulus heteroclitus</i>) - Longnose killfish (<i>Fundulus sirnilis</i>) - Silversides (<i>Menidia</i> sp.) - Threespine stickleback (<i>Gasterosteus aculeatus</i>) - Pinfish (<i>Lagodon rhomboides</i>) - Spot (<i>Leiostomus xanthurus</i>) - Shiner perch (<i>Cymatogaster aggregata</i>) - Tidepool sculpin (<i>Oligocottus maculosus</i>) - Sanddab (<i>Citharichthys stigmaeus</i>) - Flounder (<i>Paralichthys dentatus</i>, <i>P. lethostigma</i>) - Starry flounder (<i>Platichthys stellatus</i>) - English sole (<i>Parophrys vetulus</i>) - Herring (<i>Clupea harengus</i>)	survival	2 to 8 days	ASTM, 1992
---	----------	-------------	------------

Invertebrates - Copepods (<i>Acartia</i> sp.) - Shrimp (<i>Penaeus</i> sp., <i>Pandalus</i> sp.) - Grass shrimp (<i>Palaemonetes</i> sp.) - Sand shrimp (<i>Crangon septemspinosa</i>) - Mysid (<i>Mysidopsis</i> sp.) - Blue crab (<i>Callinectes sapidus</i>) - Shore crab (<i>Hemigrapsus</i> sp., <i>Pachygrapsus</i> sp.) - Green crab (<i>Carcinus meanas</i>) - Fiddler crab (<i>Uca</i> sp.) - Oyster (<i>Crassostrea</i> sp.) - Blue mussel (<i>Mytilus edulis</i>) - Hard clam (<i>Mercenaria mercenaria</i>) - Polychaete (<i>Capitella capitata</i>)	immobilization and/or survival	2 to 8 days	ASTM, 1992
<u>Chronic Toxicity Tests</u> <u>Early Life-Stage Toxicity Tests</u> Fish - Gulf toadfish (<i>Opsanus beta</i>) - Sheepshead minnow - Atlantic silversides (<i>Menidia menidia</i>) - Inland silversides larval test (<i>M. berylina</i>)	survival/growth	42 days 28 days 28 days 7 days	ASTM, 1992
Invertebrates Echinoderm sperm cell fertilization test - Sea urchin (<i>Strongylocentrotus</i> <i>droebachienses</i>) - Sand dollar (<i>Dendraster</i> <i>excentricus</i>)	fertilization	200 minutes	Dinnel et al., 1987

Bacteria - <i>Photobacterium phosphoreum</i> (Microtox®)	biolumin- escence	15 minutes	PSEP, 1991
Sediments			
Fish Anaphase aberration test (rainbow trout gonad cells)	genotoxicity/ cytotoxicity	48 hours	PSEP, 1991
Invertebrates Amphipods - <i>Phepoxyneus abronius</i> - <i>Eohaustorius estuarius</i> - <i>Ampelisca abdita</i> - <i>Grandidierella japonica</i>	survival/ avoidance	10 days	ASTM, 1992
Polychaete (<i>Neanthes</i> sp.)	survival/growth	20 days	PSEP, 1991
Bacteria - <i>Photobacterium phosphoreum</i> (Microtox®)	biolumin- escence	15 minutes	PSEP, 1991

E.5.a Exposure Indicators

The most appropriate biochemical endpoints to measure exposure to oil and its by-products include bioaccumulation in tissues and presence of hydrocarbon metabolites in bile. Bioaccumulation in tissues is a direct measure of exposure and applicable to oil discharge conditions. Petroleum hydrocarbons are highly lipophilic and known to have high bioconcentration factors for many organisms, particularly shellfish (Scott et al., 1984). There are numerous studies on bioconcentration factors, uptake, and depuration-rate kinetics for different species and biological organs.

One commonly used technique for bioaccumulation studies is the deployment of mussels collected from resident natural populations in the affected area to measure both bioavailability and degree of exposure (Salazar, 1992). Mussel collection procedures are relatively easy and chemical analyses of tissues are standardized (NOAA, 1989). Salazar (1992) provides the following guidelines for using mussels in support of natural resource damage assessment studies:

- To discriminate differences of exposure and response among assessment sites, a 12-week exposure period is recommended;
- Adults appear more sensitive and have lower survival rates than juvenile mussels;
- Size sorting of individual organisms is important because juvenile mussels grow faster and appear to accumulate higher concentrations of contaminants in their tissues than adults;
- To increase survival rates during deployment, large clusters should be separated by hand, not machine; and
- If determination of sublethal effects, such as growth rates, is an objective, it is important to have adequate replication and measurement of each live animal at the beginning and end of the exposure.

Resident mussel populations can be used for monitoring if the area affected by the discharge includes stations with an historical record of levels of contaminants as suggested by Brooks et al. (1991).

A second category of exposure indicators are those that indirectly measure exposure by detecting a biochemical response to the exposure. This approach is used, where the hydrocarbons do not readily bioaccumulate, such as for fish which rapidly metabolize the oil (Varanasi et al., 1989); when direct measurement of the contaminant is difficult, or when the contaminant was depurated from the organism. Appropriate measurements for oil discharge studies include metabolites in the bile of fish (Varanasi et al., 1989) and hepatic MFO enzyme activity in fish and molluscs (Payne et al., 1986; Collier and Varanasi, 1991). The measurement in fish of reactions catalyzed by the hepatic cytochrome P4501A may prove useful in monitoring oil discharge effects. However, much more work is required to translate exposure and sublethal stress, as detected by monitoring of biomarkers, into biological effects at the population, community, or ecosystem level.

E.5.b Response Indicators

Response indicators are used to demonstrate that effects occurred as a result of exposure to the discharged oil. Although work was completed on response indicators at various levels of ecological organization, from the individual to the community (Hellawell, 1986; Hunsaker and Carpenter, 1990), the most timely indicators are survival and histopathology at the individual organism level for preassessment data collection.

Reduction in survival is a biological response that integrates exposure to environmental concentrations of contaminants. It is one of the least sensitive endpoints because mortality is an all-or-nothing response. However, important information can be gained from monitoring survival of selected organisms, especially where toxicity responses are well documented. Histopathology, the study of tissue responses to injury or disease, can be an important tool during preassessment to determine whether the cause of death of an organism could be related to exposure to the oil discharge and as an early indication of biological effects resulting from sublethal exposure. Most research on histopathological biomarkers have focused on the liver of higher organisms such as fish, where neoplasms (i.e., cancerous tumors), areas of excessive growth, and specific degenerative or necrotic lesions are reported (Myers et al., 1990). Some of these responses are from long-term, chronic exposures. More appropriate during preassessment might be indicators of acute exposures, such as injuries to the gills, lesions on the skin, eyes, and lips of fish. Histopathological studies of dead birds and mammals are often used to determine the cause of death.

Most of the time, histopathological analyses are conducted by Federal or State laboratories, the agencies that manage the affected resource. These agencies have the expertise needed to properly collect organisms, prepare the tissue sections, and examine and interpret the data.

E.6 Ecological Sampling

The wide range of biological systems potentially affected by an incident makes it extremely difficult to identify specific ecological sampling protocols appropriate for preassessment activities.

For a specific natural resource, experts knowledgeable in quantitative field methods and data analysis should be consulted to assist in the design of data collection plans. The types of ecological sampling that may be conducted during preassessment include census surveys of populations, number of acutely affected organisms, number of dead organisms, various types of reproductive failure, and collection of samples for chemical and histopathological analysis.

Rapid bioassessment techniques are useful as quick, screening tools to determine if there is a need for more detailed, quantitative surveys. For example, the USEPA has published rapid bioassessment protocols for use in streams and rivers for benthic macroinvertebrates and fish (Plafkin et al., 1989). Both the USFWS and American Fisheries Society have published methods for investigation of fish kills that are appropriate for incidents in riverine and estuarine settings (Meyer and Barclay, 1990; American Fisheries Society, 1992). The American Society for Testing and Materials (1992) has published standard methods for many different types of ecological surveys. Wildlife surveys commonly use transect, quadrat, and trap counts to estimate the total population present within the study area (Anderson et al., 1976; Davis and Winstead, 1980). Assessments of intertidal communities are discussed by Gonor and Kemp (1978) and Moore and McLaughlin (1978). Many of the papers listed in Appendix C include field methods for bioassessments.

E.7 Data Collection on Recreational Participation

E.7.a Objectives

Recreation participation sampling is used to determine whether discharged oil and its degradation by-products have measurable effects on the quantity and/or quality of recreation activities. During preassessment activities at an incident, data on recreational participation are collected primarily to answer the following basic questions:

- Are there recreation activities in the incident location that might be affected?
- What are the likely effects of the incident on these recreational activities?
- Are there other locations where people may recreate instead of the incident area?

- What types of data have been previously collected for each activity at each site?

Categories of recreation activities to consider include (but are not limited to):

- Beach Recreation
- Fishing:
 - ◆ Shore/Jetty
 - ◆ Pier
 - ◆ Private Boat
 - ◆ Charter/Party Boat
- Boating
 - ◆ Motor boating
 - ◆ Sailing
- Nature Viewing:
 - ◆ Photography
 - ◆ Specimen Collecting
- Specialized Activities:
 - ◆ SCUBA Diving
 - ◆ Kayaking/Canoeing
 - ◆ Small water craft use
 - ◆ Wind surfing

E.7.b Methods

During preassessment activities, tasks should include the determination of official or *de facto* closures, identification of uses by activity and location for the affected and potentially affected areas, assessment of the availability of use level data, and initial evaluation of potential levels of injury.

E.7.b.1 Determination of Closures

Official or de facto closures of recreation sites should be determined. De facto closures include “non-official” closures due to restrictions on access to the site or limitations on activities at the site as a result of the incident and response to the incident. These closures may be imposed by local municipalities, USCG, or other official agencies as a result of health concerns, response activities, or other reasons. Determination of official closures should be made from those officials issuing the closure notice. Determination of *de facto* closures should be made from local officials and/or response personnel.

E.7.b.2 Determination of Locations of Recreational Activity

The location of activities, likely substitutes for potential injured (or closed) sites, and probable effect from the incident, can be determined through interviews with knowledgeable local officials, and/or current users. Possible interview questions should determine the types of recreation that occur at sites most likely affected by the incident, recreation patterns (i.e., peak times of day, week, season), possible substitute locations, characteristics of substitute sites relative to the primary site, and likely levels of activities.

E.7.b.3 Availability of Use Level Data

The availability of use level data for those activities potentially affected by the incident should be made during the Preassessment Phase. Possible data sources could include:

- Local knowledgeable officials
- Revenue generating agencies
- Enforcement officials
- Local recreation businesses
- Available databases on recreation activities

E.7.b.4 Assessment on Potential Injury Levels

Determination of the potential injury levels should be made during the Preassessment Phase. This determination can be made by combining the information gathered from the previous three steps of data collection. If the extent of injury, or resultant effects, cannot be determined, preassessment for these activities should cease; otherwise preassessment should continue to calculate preliminary estimates of damages.

E.8 Data Collection to Assess Navigational Effects

E.8.a Objectives

One of the potential services provided by surface water is the provision of navigational access. Preassessment of navigation patterns is conducted to determine whether the discharged oil and its degradation by-products have measurable effects on the loss of surface water for navigation. Injury to surface water resources can be measured, in part, through the loss of navigational access. This loss of access can be measured by comparing vessel movements predicted to have occurred in the absence of the incident with the actual vessel traffic patterns during the incident. Preassessment activities should include the determination of port closures and potential levels of shipping activity.

E.8.b Methods

During the preassessment activities, tasks should include the determination of access closures and of typical navigation access levels. Information regarding closures of navigation access can be obtained from the USCG “Captain of the Port Notices.” Closures typically vary by time of day and location during an incident and thus daily if not hourly closures should be documented. Information regarding typical shipping patterns may be obtained through either of two primary sources, depending on the amount of shipping activity. In the case that a Vessel Traffic Service (VTS) is present in the port, information relevant to this preassessment activity can be obtained from this system. Information available from the VTS includes date and time of entry into the VTS reporting area, vessel name, next and previous port of call, vessel length, vessel draft, vessel beam, and vessel type (e.g. tanker, container ship, etc.). In addition, information regarding the location and time of vessels anchored outside the port, as a result of the closure, should be obtained.

In the event that no VTS is present in the port, the information necessary for surface water effects through lost navigational access can be obtained from vessel logs. Vessel logs are available from the shipping agents of the various vessels. The local Harbor Pilots Association can list those ships requiring a harbor pilot to enter the port and thus can identify the appropriate shipping agent. Information to be obtained from the vessel logs is similar to that obtained from the VTS reports.

Preassessment activities should include the determination of port closures and potential levels of shipping activity. If the extent of navigation access effects cannot be determined, preassessment for this activity should cease, otherwise preassessment should continue with estimating damages.

E.9 References

- American Fisheries Society. 1992. Monetary Values of Freshwater Fish and Fish-Kill Counting Guidelines: American Fisheries Society Special Publication.
- American Public Health Association. 1989. Standard Methods for the Examination of Water and Wastewater: 16th Edition, APHA, Washington, DC, 1,268 pp.
- American Society for Testing and Materials, 1992, Annual Book of ASTM Standards: Water and Environmental Technology: Vol. 11.04, ASTM, Philadelphia, PA, 1,103 pp.
- Anderson, D.R., J.L. Laake, B.R. Crain, and K.P. Burnham. 1976. Guidelines for Line Transect Sampling of Biological Populations: Utah Cooperative Wildlife Research Unit, Logan, UT, 27 pp.
- Brooks, J.M., M.A. Champ, T.L. Wade, and S.J. McDonald. 1991. GEARS: Response Strategy for Oil and Hazardous Spills: Sea Technology, April 1991, pp. 25-32.
- Collier, T.K. and U. Varanasi. 1991. Hepatic activities of xenobiotic metabolizing enzymes and biliary levels of xenobiotics in English sole (*Parophrys vetulus*) exposed to environmental contaminants: Archives Environ. Contamin. Toxicol., Vol. 20, pp. 462-473.
- Davis, D.E. and R.L. Winstead. 1980. Estimating the numbers of wildlife populations: in S.D. Schemnitz (Ed.), Wildlife Management Techniques Manual, Fourth Edition, The Wildlife Society, Washington, DC, pp. 221-245.
- Debusschere, K.D., D. Lindstedt, S. Penland, K. Ramsey, R. Seal, and K.A. Westphal 1992. Development of a shoreline impact assessment team response program for marine oil spills: Report to LOOP, Inc., by Louisiana Geological Survey, Baton Rouge, LA, 4 volumes.
- Dinnel, P.A., J.M. Link, and Q.J. Stober. 1987. Improved methodology for a sea urchin sperm cell bioassay for marine waters: Archives Environ. Contamin. Toxicol., Vol 16, pp. 23-32.
- Gonor, J.J. and P.F. Kemp. 1978. Procedures for Quantitative Ecological Assessments in Intertidal Environments: Publ. No. EPA-600/3-78-087, Corvallis, OR.

- Hellawell, J.M.. 1986. Biological indicators of freshwater pollution and environmental management: Elsevier Applied Science Publishers, New York, NY, 546 pp.
- Henry, C.B., Jr. 1993. pers. comm: Institute for Environmental Studies, Louisiana State University, Baton Rouge, LA.
- Huggett, R.J., R.A. Kimerle, P.M. Mehrle, and H.L. Bergman, (Eds.). 1992. Biomarkers: Biochemical, Physiological, and Histological Markers of Anthropogenic Stress: Proc. Eighth Pellston Workshop, Keystone, CO, July 23-28, 1989, Lewis Publishers, Boca Raton.
- Hunsaker, C.T. and D.E. Carpenter, (Eds.). 1990. Ecological Indicators for the Environmental Monitoring and Assessment Program: EPA 600/3-90/060, U.S. Environmental Protection Agency, Office of Res. and Development, Research Triangle Park, NC.
- MacDonald, D.A., M.B. Matta, L.J. Field, C. Cairncross, and M.D. Munn. 1992. The Coastal Resource Coordinator's Bioassessment Manual: Report No. HAZMAT 93-1, National Oceanic and Atmospheric Administration, Seattle, WA, 137 pp. plus appendices.
- Meyer, F.P. and L.A. Barclay, (Eds.). 1990. Field Manual for the Investigation of Fish Kills: U.S. Fish and Wildlife Service, Resource Publication 177, 120 pp.
- Moore, S.F. and D.B. McLaughlin. 1978. Design of Field Experiments to Determine the Ecological Effects of Petroleum in Intertidal Ecosystems: NOAA/EPA Interagency Energy/Environmental R&D Program Report, EPA-600/7-78-231, 183 pp.
- Myers, M.S., J.T. Landahl, M.M. Krahn, L.L. Johnson, and B.B. McCain. 1990 Overview of studies on liver carcinogenesis in English sole from Puget Sound; Evidence for a xenobiotic chemical etiology I: Pathology and Epizootiology: The Science of the Total Environment, Vol. 94, pp. 33-50.
- NOAA. 1989. A summary of data on tissue contamination from the first three years (1986-1988) of the mussel watch program: NOAA Technical Memorandum NOAA OMA 49, National Status and Trends Program, Rockville, MD.
- NOAA. 1994. Natural Resource Damage Assessment: Emergency Guidance Manual, v. 1.1: Damage Assessment Center, NOAA, Rockville, MD, 119 pp. plus 13 appendices.
- Owens, E.H. 1991. Shoreline evaluation methods developed during the *Nestucca* response in British Columbia: in Proc. 1991 International Oil Spill Conf., American Petroleum Institute, Publ. No. 4529, Washington, DC, pp. 177-179.

- Parkhurst, B., G. Lindler, K. McBee, G. Bitton, B. Dutka, and C. Hendricks. 1989 Toxicity tests: in W. Warren-Hicks, B.R. Parkhurst, and S.S. Baker (Eds.), Ecological Assessments of Hazardous Waste Sites: A Field and Laboratory Reference Document, EPA/600/3-891013, U.S. Environmental Protection Agency, Environmental Research Laboratory, Corvallis, OR, pp. 70-131.
- Payne, J.F., L.L. Fancey, A.D. Rahimtula, and E.L. Porter. 1986. Review and perspective on the use of mixed-function oxygenase enzymes in biological monitoring: Comp. Biochem. Physiol., Vol. 86C, pp. 233-245.
- Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M. Hughes. 1989. Rapid bioassessment protocols for use in streams and rivers: Benthic macroinvertebrates and fish: EPA/444/4-89-001, Office of Water, U.S. Environmental Protection Agency, Washington, DC.
- Puget Sound Estuary Program. 1991. Interim Final: Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediment: U.S. Environmental Protection Agency, Region 10, Seattle, WA.
- Salazar, M.H. 1992. Use and misuse of mussels in natural resource damage assessment: in Proc. MTS'92, Marine Technology Society, Washington, DC, pp. 257-264.
- Scott, G.I., T.G. Ballou, and J.A. Dahlin. 1984. Summary and evaluation of the toxicological and physiological effects of pollutants on shellfish-Part Two: Petroleum hydrocarbons: Report submitted to NOAA, Seattle, WA, by Research Planning, Inc., Columbia, SC, 67 pp. plus appendices.
- U.S. Environmental Protection Agency. 1985. Methods for measuring the acute toxicity of effluents to freshwater and marine organisms: EPA/600/4-85/013, Environmental Monitoring and Support Laboratory, Cincinnati, OH.
- U.S. Environmental Protection Agency. 1989. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms: EPA/600/4-89/001, Environmental Monitoring and Support Laboratory, Cincinnati, OH.
- Varanasi, U., J.E. Stein, and M. Nishimoto. 1989. Biotransformation and disposition of PAH in fish: in Varanasi, U. (Ed.), Metabolism of Polycyclic Aromatic Hydrocarbons in the Aquatic Environment, CRC Uniscience Series, CRC Press, Inc., Boca Raton, FL, pp. 93-150.

Table of Contents

F.1 Introduction	F-1
F.2 Standard Emergency Field Kit	F-1
F.3 Optional Equipment for Standard Kits	F-4
F.4 Specialized Survey Kits	F-4
F.4.a Shoreline Survey Kit.....	F-4
F.4 b Water Sampling Kit	F-5
F.4.c Aquatic Biological Sampling Kit	F-6

F.1 Introduction

Because of the unplanned nature of incidents, it is important that trustees have emergency field kits ready for use at all times. These kits should contain the equipment and supplies needed to implement preassessment activities. The kits should contain the minimum items needed to document effects and implement data collection. There may be different versions of emergency field kits for the different types of natural resources and receiving environments that may be encountered.

F.2 Standard Emergency Field Kit

The standard kit contains the equipment and supplies most likely needed for preassessment activities at most incidents. At the time of an incident, nautical charts, topographic maps, and road maps for the incident site are added.

- 92-quart cooler with side handles (can be used as carrying case for the kit)
- Day pack
- Box-type plastic clipboards
- Waterproof logbooks with numbered pages
- Expanding file folders, containing the following paper/forms
 - ◆ Original and copies of field forms to be used
 - ◆ Waterproof paper for copying field forms
 - ◆ Chain-of-custody forms
 - ◆ Activities checklist
 - ◆ Organization phone lists
 - ◆ QA protocols for selected sampling methods
 - ◆ Sample tags and labels
 - ◆ Field estimator guides for percent cover, grain size, etc.

- Camera: 35-mm, SLR with 50-mm lens, UV and polarizing filters, carrying case
- Film: five rolls each of ASA 64, 100, and 400 slide film; color print film
- Photoscales: 15 cm and 30 cm
- Mechanical pencils with replacement lead and erasers
- Waterproof ink markers
- Color pencil and marker sets
- Pads of paper
- Ruler and dividers
- Large, heavy rubber bands
- Various types of tape: masking, cellophane, strapping, electrical, and duct tape
- Plastic bags: various sizes of Ziploc bags; whirl-pak bags; large trash bags
- Calculator
- Micro-cassette tape recorder, with extra tapes and batteries
- Hand lens
- Tally meter
- Flashlight with extra batteries
- Binoculars
- Compass

- Refractometer
- Thermometer
- Rubber gloves, both surgical and heavy-duty vinyl
- Ear plugs
- Tear-off towelettes
- First-aid kit
- Field pocket knife
- Folding shovel
- Wooden tongue depressors in small packs
- Roll of paper towels
- Disposable plastic scoops and stainless steel spatulas
- Precleaned aluminum foil and extra rolls
- Evidence tape
- Sample jars: precleaned glass jars with teflon lids
 - ◆ 100-ml: box of 24
 - ◆ 500-ml: box of 12
 - ◆ 1,000-ml: box of 12
 - ◆ 1-gallon bottles: box of 4, with shipping containers

- Prepaid overnight carrier shipping forms
- Field guide books (birds, fish, invertebrates, mammals, plants, macroalgae, etc.)

F.3 Optional Equipment for Standard Kits

In addition to the items listed above, there are larger and more expensive pieces of equipment that can be extremely valuable on-scene. It is usually possible to lease these from local vendors at the site of the incident or ship them on-scene once the need arises. These include:

- Pager for each team member, assuming that there is coverage for the discharge site
- Portable cellular phone, assuming that there is coverage for the discharge site
- All-weather video camera, with extra batteries, extra tapes, and cigarette lighter recharger option
- Portable computer with FAX modem and extra disks
- Portable printer
- Global Positioning System (GPS) hand-held unit

F.4 Specialized Survey Kits

In addition to the items listed above, special kits can be developed for different types of surveys.

F.4.a Shoreline Survey Kit

The following materials are recommended for shoreline surveys.

- Profile rod set
- 50-m fiberglass tape measure
- Hand level

- Flagging tape
- Cement trowel for scraping the surface of trenches
- Precleaned aluminum core barrels
- Grain-size estimators
- 0.25 m² and 1.0 m² quadrats

F.4.b Water Sampling Kit

Water samples need to be kept cold and dark immediately after collection to minimize sample degradation. Samples should be collected directly in the sample jar rather than transferred from the collecting bottle into the sample jar.

- Water-sample holder to collect water samples directly in the sampling jar
- Additional boxes of precleaned glass jars (1,000-ml and 1-gallon)
- Teflon squeeze bottle for rinsing solvents
- Rinsing solvents for cleaning sample holder
- Preserving chemicals, if needed
- Solvent waste container
- Alconox cleaner soap
- Scrubbing brush
- Collapsible containers
- Salinity, temperature, and conductivity meter

F.4.c Aquatic Biological Sampling Kit

If the kit is to be shipped by a commercial carrier, the need for special packages or volume limits for fixatives and preservatives should be determined.

- Small dip net
- Small grab or dredge (e.g., Ponar grab, Ekman dredge)
- Small beach seine
- Kick net
- Small plankton net with several replacement nets and collecting bottles
- Sieve bucket
- Wash bottle and graduated cylinder
- Collapsible plastic containers
- Fish measuring board
- Nalgene sample bottles, various sizes
- Identification keys (e.g., invertebrates, fish)
- Field balance
- Fixatives
- Preservatives
- Sorting pans with white bottoms
- Field forms

- Meter sticks
- Photoscales
- 0.25 m² and 1.0 m² quadrats
- Sample vials, various sizes
- Sample labels
- Permanent markers
- Random number table
- Magnifier

Table of Contents

G.1 Introduction	G-1
G.2 Baseline and Historical Data	G-1
G.3 Case Histories of Previous Incidents	G-3
G.4 Incident-Specific Data	G-3
G.4.a Mapping Oil Distribution	G-4
G.4 b Collection of Chemical Samples	G-4
G.4.c Documentation of Immediate Effects	G-6
G.5 Data on Reference and Control Conditions	G-6
G.6 Quality Assurance.....	G-7
G.7 References.....	G-8

G.1 Introduction

During the Preassessment Phase, the trustees are encouraged to collect and analyze all necessary information that may be reasonably connected to the incident; including baseline and historical data, case histories of previous incidents, incident-specific data, and data on reference and control conditions.

G.2 Baseline and Historical Data

Baseline data refers to on-site information of conditions prior to the incident that are compared to site-specific information of those same conditions subsequent to the incident. Data on baseline conditions provide quantitative information on natural variability of natural resources and other (i.e., human-induced) variability, therefore serving as a temporal comparison. Such data should be collected from locations and natural resources and services that may be affected by the incident. When baseline data is lacking, the trustees may need to rely on more qualitative historical data that may serve to identify preexisting trends.

The NRDA approach is dictated, in part, by the extent and quality of baseline data on potentially affected natural resources and services. In past NRDAs, baseline data were seldom of sufficient extent and quality to fully satisfy the needs of injury quantification. Very few monitoring programs include appropriate analytical targets useful to assess baseline petroleum hydrocarbon contamination levels and sources. The National Status and Trends Program of NOAA and various State Mussel Watch Programs are possible sources of baseline data and long-term trends on petroleum hydrocarbons in sediment and bivalve shellfish. Baseline data on biological and human-use natural resources should be carefully reviewed for the quality of data collection and analysis, the absence of intervening events that would affect the natural resources (e.g., unusual weather, salt-water intrusion, or other discharges), and whether the sampling methods used in the baseline data collection are comparable with the sampling design used in incident-specific studies. Oftentimes, baseline and historical data are valuable during preassessment activities to characterize the environmental setting of the incident site, identify the potential natural resources and services at risk, indicate variability in the natural resources and services, and understand community and ecosystem inter-relationships that may be affected by the incident.

G.3 Case Histories of Previous Incidents

- A special type of data collected during the Preassessment Phase includes case histories of previous incidents under comparable conditions to the incident of concern. An understanding of appropriate case histories will allow the trustees to focus their activities on the natural resources and services most likely at risk. Many oil-related incident effects are well documented by scientific studies of previous incidents or demonstrated from laboratory experiments. Trustees should collect and evaluate the oil literature, with the following objectives:
- Provide empirical data on the natural resources and services most likely at risk. Although each incident is a unique combination of conditions, a review of previous incidents of the same or comparable type, environmental setting, and physical processes can assist the trustees in identification of the natural resources and services most likely at risk. The trustees should compile a list of natural resources and services present, and, based on studies of previous incidents and the advice of experts, identify those natural resources and services that may be affected by the incident. For example, whales and dolphins often surface in the vicinity of slicks during oil discharges, but very few studies have reported any immediately discernible detrimental effects (Geraci, 1990). In the absence of obvious effects on dolphins during a discharge, the trustees should turn to the oil literature to determine if effects to dolphins were reported for other discharges under comparable conditions.
- Develop the conceptual model for pathways of exposure. There will only be limited chemical data available during the Preassessment Phase of an incident that the trustees can use to evaluate the potential extent of exposure. The trustees will have to rely on the literature for the behavior and fate of an oil to develop a conceptual model to determine how the oil is most likely transported in water, sediments, and tissues and the relative concentrations and composition of the oil as it is transported and weathered. This conceptual model drives the prediction of which natural resources may be exposed (i.e., directly or indirectly) or be threatened to be exposed.
- Identify successful methods for injury assessment. Standard methods for injury assessment can be used for incidents. However, trustees may need to enact special refinements to tailor the method to the specific conditions of the incident. The trustees will especially need to focus on terminology for oiling categories, guidelines for sampling in contaminated environments, and specific analytes for chemical analysis and interpretation.

- Provide the basis for determining restoration. An integral part of the preassessment process is estimating the scope and extent of injury so as to develop a basis for selecting and scaling feasible restoration alternatives. Until this estimation is complete, trustees will have to rely upon the literature and their best professional judgment to offer possible restoration alternatives. For example, recovery rates for oiled marshes can be derived from monitoring studies of previous incidents that were comparable in type and degree of oiling, vegetation type, physical setting, and substrate.

The literature on case histories of and research results on incidents is widely scattered and much of it is gray literature. Since 1969, the American Petroleum Institute, in conjunction with the USCG and USEPA, has sponsored a bi-annual Oil Spill Conference and proceedings. Though the conference covers policy, training, operations, and legal issues as well as scientific studies, the proceedings are an excellent source for identifying case histories, literature, and researchers on many different topics. Environment Canada sponsors an annual Arctic Marine Oil Spill Program conference that also publishes a proceedings, with emphasis on arctic oil discharge issues. The National Research Council (NRC, 1985) published a summary of oil inputs, fates, and effects in marine ecosystems as an update to a 1975 synthesis.

In addition to peer-reviewed journals, case histories and effects related to oil spill incidents are published in a series of special topic books. Unfortunately, there is no current, comprehensive synthesis of the oil-effects literature. Further, many recent, quantitative studies are kept confidential until on-going NRDA's are settled.

G.4 Incident-Specific Data

Incident-specific data is usually needed for injury determination and quantification. Incident-specific data collection and analysis are likely to fall into the following three categories:

- Mapping of oil distribution;
- Collection of chemical samples; and
- Documentation of immediate effects.

Each of these categories is discussed in the following sections.

G.4.a Mapping Oil Distribution

One of the most important types of data that needs to be systematically collected during the early stages of an incident is detailed documentation of the areal extent of the oil contamination on the water surface, along the shoreline, in sediments, and on land. Time-series maps may be needed, depending on the duration of the incident. Standard terms for characterizing the amount of oil should be defined and used. Often it is difficult to enforce the use of standard terms among different teams and particularly over time as the amount of oil diminishes. Photodocumentation by all teams becomes very important as a means to verify and calibrate the actual use of field descriptors. If the data are collected properly, they can be used for stratifying habitats by the degree of oiling to compute a mass balance of the discharge, estimate exposure, and validate computer models. Distribution of oil slicks on the water should be mapped daily until the slicks dissipate. Maps of oil on the shoreline or land should be generated once most of the oil is stranded and then over time to predict recovery rates or document on-going exposure.

At most larger incidents, the response organization generates information on oil distribution on a daily basis, either as descriptions or maps. The trustees should rely on this source of information when it is available and not duplicate these efforts. However, the response organization may not always generate degree-of-oiling data to the scale needed for NRDA use. The trustees should therefore keep track of the status and scale of oil mapping efforts by the response agencies and be prepared to supplement mapping efforts or continue making observations as needed, once the response effort is terminated. If supplemental data collection is required, the trustees should collaborate with the Federal or State OSC or designee.

G.4.b Collection of Chemical Samples

Samples for chemical analysis during the early stages of an incident consist of two general types, fingerprinting of the oil and measurement of the concentration of selected contaminants. For fingerprinting, samples of the known source of the discharge must be obtained. There is always a great demand for samples of the source, so a large volume (i.e., one gallon or more) should be collected, where practicable. Characterizing the neat or unweathered oil is critical so as to track the changes in the oil over time as it weathers. It is very important to confirm the origin and handling of the source material so its validity can be evaluated. The OSC or RP can usually provide a source sample. The trustees, however, should be aware that a “source” sample can be collected from floating slicks, recovery vessels, storage tanks, etc., and may be contaminated or weathered. Temporary storage barges or tanks are not regularly cleaned prior to use, so they most likely are contaminated with other materials. As with all samples, chain-of-custody documentation for the source sample should be obtained.

With a valid source oil, environmental samples can be analyzed to determine whether they are contaminated with the same oil, a technique known as fingerprinting. Samples for fingerprinting are collected to answer the question “Is this the same oil as was discharged?” Oiled samples therefore do not have to be quantified or related to a measured amount. Samples do not have to be representative of the amount of oil present, only the type. Fingerprint samples may be collected from sheens from the water surface where there is concern about multiple sources of floating oil. Tarballs on beaches can be fingerprinted to differentiate the discharged oil from chronic background accumulation. Samples of oiled feathers from birds or mammals are collected to link the oiled animal to the discharge. Bivalve molluscs, both in-situ as well as caged, can be sampled to measure bioavailability of the oil, assuming that the discharged oil in tissue samples can be fingerprinted and differentiated from background or other sources over time.

Samples for quantitative measurement of a contaminant must be collected in a manner that is representative of the area being sampled. Because of extensive patchiness in the distribution of oil, collection of representative samples can become quite complicated. The trustees should identify sampling objectives and develop appropriate sampling approaches, including the number of replicate and composite samples. One approach is to collect a larger number of samples or replicates. A subset of those samples can then be selected for preliminary analysis to screen for the magnitude of variability or concentrations at the sites where maximum contamination is expected. Proper sample preservation methods and holding times should be used.

Representative water samples are very difficult to collect, especially where surface oil slicks are present. Contamination is likely. Surface slicks are also likely to track differently than contaminated plumes of water. Further, evaporation and dilution rapidly decreases concentrations in the water column to very low levels, except where such processes are restricted (i.e., in rivers and streams, isolated water bodies, or very cold climates). In most coastal and marine settings water, samples for quantitative analysis of oil concentrations are not a high priority. In riverine and shallow waterbody settings, with light products such as No. 2 fuel oil and jet fuel and where public water supplies are at risk, water-column sampling is more appropriate.

Other types of collection and measurement that may be appropriate during incident studies include temperature, salinity, and dissolved oxygen, so that the basic water-quality conditions of the site are documented. Detailed descriptions of the sampling location should be recorded, including visual description of the degree of oil contamination of the site, physical setting, elevation or depth, description of the sample (e.g., grain size, nature of contamination, water turbidity, etc.), and type of sample (i.e., grab, composite).

For all data collection and analysis efforts, development of and compliance with QA plans are essential. Any deviation from the approved and published plan should be documented, and the potential effect on the validity of the sample determined. Without careful pre-incident planning, collection of samples during an incident may result in important data being lost.

G.4.c Documentation of Immediate Effects

Early on-scene surveys of the affected area will be needed to determine short-term effects to natural resources and services that occur soon after the incident. Such effects include, but are not limited to, fish kills, dead and oiled birds and mammals, closures of recreational parks, and reduced human use of the oiled areas. Sampling and census of these effects must be conducted during the time of occurrence. Taking census of populations that are actually present in the affected or threatened areas can provide field data or verification for computer models. Natural resources or services that have significant spatial or temporal variations in their distribution or life stage (e.g., migratory waterfowl and spawning streams for anadromous fish) need on-scene documentation relative to their presence and activity at the time of the discharge. Photodocumentation of oiled and affected natural resources and services should be an integral component of all early data collection activities.

G.5 Data on Reference and Control Conditions

During the Preassessment Phase it may be necessary to establish reference and/or control conditions. Reference and control data refers to off-site information of unaffected conditions that are compared to the similar or same, respectively, on-site conditions affected by the incident. Establishing such conditions soon after the initial oiling will allow the trustees to document the extent of exposure as well as collect data on the presence and condition of natural resources and services at the time of exposure.

Data on reference and control conditions are needed to provide spatial comparisons. Most study objectives will involve detecting differences or making comparisons and thus require a reference or control from which to measure change. Reference and control conditions should be selected based on the close resemblance and proximity to the affected conditions, but remain free from the potential effects resulting from the incident. Reference or control conditions, however, may not always be available because of the nature or size of the incident relative to the natural resources and services affected, or the special status of specific natural resources and services (i.e., unique habitats, sensitive species).

G.6 Quality Assurance (QA)

Quality Assurance (QA) is essential for the collection and analysis of data in a manner that is scientifically acceptable and legally defensible. Since data collected during the Preassessment Phase may form the basis for spatial and temporal comparisons, these data must be collected in a manner that ensures their highest quality and validity. Because of the unplanned nature of incidents, QA development through pre-incident planning efforts is most efficacious.

One way to ensure that data collected during the Preassessment Phase meets these requirements is to follow the USEPA guidelines for preparing QA project plans (USEPA, 1980). There is a pocket guide on Preparing Perfect Project Plans (USEPA, 1989) that outlines and summarizes the process. Additional guidance on QA project plans can be found in Gaskin, (1988), Simes (1991), and USEPA (1984; 1985; 1989; 1992). While the USEPA requirements are not always applicable to an NRDA, they provide a useful reference for issues that should be addressed. During the Preassessment Phase in particular, the QA plan may be developed in phases as the need for data collection and analysis evolve. At a minimum, QA procedures should assure that:

- The sampling, processing, and analysis techniques are applied consistently and correctly;
- The number of lost, damaged, or uncollected samples is minimized;
- The integrity of the data record is maintained;
- Data collected are accurate, precise, representative, complete, and comparable with similar data collected elsewhere; and
- The study results are reproducible, within the constraints of the incident.

Duplicate counts, calibrations, laboratory replicates, verification by independent experts, and other types of data that allow an evaluation of data quality should be included in field notes and data tables so that an independent evaluation of the data quality may be performed. Therefore, trustees should take appropriate steps to ensure that such data are recorded appropriately. From a legal perspective, valid QA procedures must be followed for the data to be admissible as evidence. Appendix H contains example QA protocols for data collection and analysis during Preassessment Phase activities developed by NOAA.

G.7 References

- Geraci, J.R. 1990. Physiologic and toxic effects on cetaceans: in Geraci, J.R. and D.J. St. Aubin (Eds.), *Sea Mammals and Oil: Confronting the Risks*, Academic Press, Inc., San Diego, CA, pp. 167-198.
- NRC. 1990. *Oil in the Sea: Inputs, Fates, and Effects*, National Academy Press, Washington, D.C. 1985.
- Simes, G.F. 1991. Preparation aids for the development of Category I quality assurance, project plans: U.S. Environmental Protection Agency, Office of Research and Development, EPA/600/8-91/003, Risk Reduction Engineering Laboratory, Cincinnati, OH.
- U.S. Environmental Protection Agency. 1980. Interim guidelines and specifications for preparing quality assurance project plans: Office of Monitoring Systems and Quality Assurance Office of Research and Development, QAMS-005/80, Washington, DC.
- U.S. Environmental Protection Agency. 1984. Sediment sampling quality assurance user's guide: Environmental Monitoring Support Laboratory, Las Vegas, NV.
- U.S. Environmental Protection Agency. 1985. Interim guidance on quality assurance/quality control (QA/QC) for the estuarine field and laboratory methods: Office of Marine and Estuarine Protection, Washington, DC.
- U.S. Environmental Protection Agency. 1989. Preparing perfect project plans: EPA/600/9-89/087, Risk Reduction Engineering Laboratory, Cincinnati, OH, 61 pp.
- U.S. Environmental Protection Agency. 1989. Soil sampling quality assurance user's guide, Review Draft: Environmental Monitoring Support Laboratory, Las Vegas, NV.
- U.S. Environmental Protection Agency. 1992. Recommended analytical techniques and quality assurance/quality control guidelines for the measurement of organic and inorganic analytes in marine sediment and tissue samples: Environmental Research Laboratory, Narragansett, RI.

Table of Contents

H.1 Introduction	H-1
H.2 Sampling Preparation.....	H-1
H.3 Documentation.....	H-2
H.4 Collection of Water Samples.....	H-4
H.5 Collection of Subtidal Surficial Sediments.....	H-5
H.5.a Design and Operation of Sediment Samplers	H-5
H.5.b Sediment Sampling Interval	H-7
H.5.c Sediment Sample Acceptability Criteria.....	H-8
H.5.d Sediment Sample Collection	H-8
H.5.e Sediment Sample Homogenization	H-10
H.5.f Collection of Sediment Chemistry Samples	H-10
H.5.g Replication of Samples for Toxicity Testing.....	H-11
H.6 Collection of Intertidal Sediments and Soils	H-11
H.7 Tissue Sampling	H-11
H.8 Sample Shipment	H-12
H.9 References.....	H-12

H.1 Introduction

Quality assurance (QA) procedures are necessary to ensure that data are collected in a scientifically valid manner. This section describes many of the more general QA procedures that should be considered when collecting and analyzing environmental samples as part of data collection and analysis during the Preassessment Phase of an NRDA involving an incident. These procedures are general in nature because they pertain to samples collected for most kinds of environmental variables. They include procedures that should be followed when samples are collected in the field and shipped to laboratories (Puget Sound Estuary Program, 1991).

The USEPA has developed four QA approaches in its QA program (USEPA, 1991). Category I projects (i.e., major discharges of oil) involve the most rigorous and detailed approach, while Category IV projects involves the least stringent approach. The trustees should use the approach, or some version of it, that most accurately reflects the intended use of the data and the type of work being conducted

H.2 Sampling Preparation

All members of the field team should thoroughly review the field survey plan, including QA criteria, before each sampling excursion. The plan should be checked for completeness and clarity of objectives. A complete plan should contain the following major elements:

- Identification of the scientific party and responsibilities of each member;
- Statement and prioritization of study objectives;
- Description of survey area, including background information and station locations;
- Identification of variables measured and required containers and preservatives;
- Identification of all sample splits or performance samples submitted with the survey samples;
- Brief description of sampling methods, including station positioning technique, sampling devices, replication, and any special considerations;
- Detailed sampling schedule, including time, date, and location of embarkation and debarkation;
- Storage and shipping procedures;

- Identification of laboratories to which samples should be shipped after completion of sample collection;
- Survey logistics requirements (e.g., on vessels should include laboratory and sample storage needs); and
- All special equipment needed for the survey (e.g., GPS unit, video camera, communication devices).

Study objectives and their prioritization should be understood by all members of the sampling team. This will ensure that if modifications of the survey plan become necessary in the field, their effect on the overall goals of the survey can be evaluated adequately. After the sampling plan is reviewed, contingency plans should be outlined. These plans should include potential problems and their solutions. To ensure that all required sampling equipment and supplies are available at the time of sampling, an equipment checklist should be constructed. Spare parts and backup supplies should be included in the inventory.

H.3 Documentation

It is important throughout any sampling and analysis program to maintain integrity of the sample from the time of collection to the point of data reporting. Proper chain-of-custody procedures allow the possession and handling of samples traced from collection to final disposition. Documents needed to maintain proper chain-of-custody include:

- **Field Logbook** - All pertinent information on field activities and sampling efforts should be recorded in a bound logbook. The field supervisor should be responsible for ensuring that sufficient detail is recorded in the logbook. The logbook should enable someone else to completely reconstruct the field activity without relying on the memory of the field crew. All entries should be made in indelible ink, with each page signed and dated by the author, and a line drawn through the remainder of any page. All corrections should consist of permanent line-out deletions that are initialed.

At a minimum, entries in a logbook should include:

- ◆ Date and time of starting work;
- ◆ Names of field supervisor and team members;
- ◆ Purpose of proposed sampling effort;

- ◆ Description of sampling sit, including information on any photographs or videos that may be taken.
 - ◆ Location of sampling site;
 - ◆ Details of actual sampling effort, particularly deviations from standard operating procedures;
 - ◆ Field observations;
 - ◆ Field measurements made (e.g., pH, temperature, flow);
 - ◆ Field laboratory analytical results;
 - ◆ Sample identification;
 - ◆ Type and number of sample bottles collected; and
 - ◆ Sample handling, packaging, labeling, and shipping information (including destination).
- Sample Labels - Labels must be waterproof and securely attached to the outside and/or placed inside each sample container (i.e., depending on the kind of sample) to prevent misidentification of samples. Labels must contain at least the sample number, preservation technique, date and time of collection, location of collection, and signature of the collector. Labels should be marked with indelible ink. Abbreviated labels may also be placed on the cap of each jar to facilitate sample identification
 - Chain-of-Custody - A chain-of-custody record must accompany every sample set. Each person who has custody of the samples must sign the form and ensure that the samples and records are not left unattended unless secured properly.
 - Custody Seals - Custody seals are used to detect unauthorized tampering with the samples. Sampling personnel should attach seals to all shipping containers sent to the laboratory by common carrier. Gummed paper seals or custody tape should be used so that the seal must be broken when the container holding the samples is opened.

H.4 Collection of Water Samples

Water samples should be collected through deployment of water samplers to the desired depth of sampling, rather than using pumps and tubing. With pumps and tubing, there is always the risk that oil droplets will adhere to the inside wall of the tubing and be released randomly, making collection of a representative water sample difficult. The most commonly used samplers are the Kemmerer, Van Dorn, Niskin, and Nansen samplers. Samplers should be teflon-lined or composed of stainless steel. Multiple water samplers can be fixed on a rosette frame so that several depths can be sampled during one cast or replicate samples can be taken at the same depth.

When collecting water samples, the best technique is to collect the sample directly in the sample container, rather than having to transfer the water from the sampler to the container. This technique will minimize the potential for loss of sample integrity due to adherence of oil droplets to the inside surfaces of the sampler. The sample container is attached to a weighted holder that has a spring-mounted teflon stopper that can be opened once the container has reached the selected depth. Some types of sample bottles are designed for deployment with the stoppers closed. For example, Go-Flo bottles have a pressure sensor that triggers the opening of the stoppers when the sample bottle reaches a depth of about 10 meters. When it is necessary to collect water samples where surface slicks are present, use of a close/open/close type of bottle is required.

When sampling in clean areas, standard water samplers can be used. Prior to deployment, the stoppers of water samplers are cocked open. At this step, it is critical that the stoppers and the interior of the sampler remain free from contamination. All members of the sampling team should avoid touching the stoppers and the insides of the sampler.

Once the sampler reaches the desired depth, it should be allowed to equilibrate with ambient conditions for 2-3 minutes before it is closed. It is recommended that at least two samplers be used simultaneously for each depth. A second sampler provides a backup to the primary sampler in case of malfunction. A second sampler also increases the volume of sample available for subsampling and rinsing. To ensure that all subsamples at a particular depth are collected from the same water parcel, it is essential that they all be taken from a single cast, such as through use of a rosette sampler. Multiple casts using a single water sampler cannot meet this objective.

Once the water sampler is brought on board the sampling vessel, the stoppers should be checked immediately for integrity of the seals. If a stopper is not properly sealed, water from the sampled depth may have leaked out during retrieval and been replaced by water from shallower depths. In such cases, the entire water sample should be rejected.

Because a visual inspection might not detect all leaks, an additional check on sampler function may be conducted when sampling in marine settings. This check involves comparing the salinity of the water sample with ambient salinity determined with a CTD (Conductivity-Temperature-Depth probe) deployed with the sampler. A significant difference between ambient salinity and the salinity of a sample or an inconsistency between the salinity of a sample and the salinity profile determined from water in the other samplers from the same cast are indications that a particular sample is invalid. Water samples for chemical analysis and toxicity testing may consist of a single grab sample or a composite collected over a specific period. Containers must be made of non-toxic materials such as Nalgene, high density polyethylene, or polypropylene, and should be new and thoroughly cleaned before use. In the field, containers should be rinsed with sample water at least three times before collecting the actual sample. Each container should be filled completely to exclude any air and sealed appropriately. All containers should be placed on ice as soon as possible. They should be kept cold (4°C) and dark, never frozen. If the sample is collected directly in the container, care should be taken to assure integrity of the sample label.

H.5 Collection of Subtidal Surficial Sediments

This section describes the procedures required to collect an acceptable subtidal surficial sediment sample for chemical analysis and/or toxicity testing. In the past, sampling crews were given relatively wide latitude in deciding how to collect samples. However, because sample collection procedures influence the results of all subsequent laboratory and data analyses, it is critical that samples be collected using acceptable and standardized techniques. Detailed methods are provided here because few groups routinely collect subtidal samples.

H.5.a Design and Operation of Sediment Samplers

The primary criterion for an adequate sampler is that it consistently collects undisturbed samples to the required depth below the sediment surface without contaminating them. An additional criterion is that the sampler can be handled properly onboard the survey vessel. An otherwise acceptable sampler may yield inadequate sediment samples if it is too large, heavy, or awkward to be handled properly. A common sampling device for subtidal surficial sediments is the modified van Veen bottom grab. However, various coring devices (e.g., box corer, Kasten corer) are also used.

Collection of undisturbed sediment requires that the sampler:

- Creates a minimal bow wake when descending;
- Closes to form a leak proof seal after the sediment sample is taken;
- Prevents sediment washout and excessive sample disturbance when ascending; and
- Allows easy access to the sample surface.

Most modified van Veen grabs have open upper faces that are fitted with rubber flaps. Upon descent the flaps are forced open to minimize the bow wake, whereas upon ascent the flaps are forced closed to prevent sample washout. Some box corers have solid flaps that are clipped open upon descent and snap shut after the corer is triggered. Although most samplers seal adequately when new, the wear and tear of repeated field use eventually reduces this sealing ability (i.e., through chipped or improperly aligned jaws). A sampler should therefore be properly maintained and monitored constantly for proper operation and minimal sample leakage. If unacceptable leakage occurs or the sampler malfunctions in any manner, the sampler should be repaired or replaced. If a sampler is borrowed or leased for a project, its operation and sealing ability should be evaluated prior to sampling. Further, it is prudent to have a backup sampler onboard the survey vessel if the primary sampler begins leaking during a cruise.

The required penetration depth below the sediment surface is a function of the desired sample depth. Generally, it is better to penetrate below the desired sample depth to minimize sample disturbance when the sampling device closes. Penetration depth of most sampling devices varies with the sediment character, greatest in fine-grained sediments and least in coarse-grained sediments. In both cases, penetration depth can be modified by adding or removing weights from the samplers. Thus, it is optimal to use a sampler that has a means of weight adjustment. If a sampler cannot consistently achieve the desired penetration depth, an alternate device should be used.

The sampler should be brought aboard the vessel with a minimum amount of swinging to minimize sample disturbance. Once the sampler is secured onboard the survey vessel, it is essential that the surface of the sample be made accessible without substantially disturbing the sample. Most samplers have hinged flaps on their upper face for this purpose. The openings in the upper face of the sampler should be large enough to allow convenient subsampling of the sediment surface. If an opening is too small, the sample may be unduly disturbed during subsampling.

The sampling device should be attached to the hydrowire of the vessel boom using a ball-bearing swivel. The swivel will minimize the twisting forces on the sampler during deployment and ensure that proper contact is made with the bottom. For safety, the hydrowire, swivel, and all shackles should have a load capacity at least 3 times greater than the weight of a full sampler. In addition, screw-pin shackles should have wire through the eye and around one side of the shackle to prevent the pin from rotating.

The sampler should be lowered through the water and retrieved at a controlled speed of approximately one foot per second. Under no circumstances should the sampler be allowed to “free fall” to the bottom, as this may result in premature triggering, an excessive bow wake, or improper orientation upon contact with the bottom. The sampler should contact the bottom gently, and only its weight or piston mechanism should be used to force it into the sediment.

H.5.b Sediment Sampling Interval

The upper 2 cm of sediment is recommended for analysis because that is the sediment horizon in which most infaunal organisms reside and the horizon that is contacted most frequently by epifaunal organisms. When collecting the upper 2 cm of sediment, it is recommended that a minimum penetration depth of 4-5 cm be achieved for each acceptable sample. The portion of sample below the upper 2 cm of sediment can be discarded after the surficial sediment is collected (unless the study design specifies otherwise).

Although the 2-cm specification is arbitrary, it will ensure that:

- Relatively recent sediments are sampled;
- Adequate volumes of sediment can readily be obtained to satisfy the needs of most study objectives; and
- Data from different studies (historical or ongoing) can be compared validly.

Sampling depths other than the upper 2 cm may be appropriate for specific purposes, or when baseline data are available for a different interval.

H.5.c Sediment Sample Acceptability Criteria

The sediment in the sampler should be inspected to determine if the sample satisfied the following acceptability criteria:

- The sampler is not overfilled with sample such that the sediment surface is pressed against the top of the sampler;
- Overlying water is present, indicating minimal leakage;
- The overlying water is not excessively turbid, indicating minimal sample disturbance;
- The sediment surface appears relatively undisturbed, indicating lack of channeling or sample washout; and
- The desired penetration depth is achieved (i.e., 4-5 cm for a 2-cm deep surficial sample).

If a sample does not meet all of these criteria, it should be rejected and discarded away from the sampling station.

H.5.d Sediment Sample Collection

After a sample is judged acceptable, the following observations should be entered on the field log sheet:

- Date and time
- Station location at the time of bottom contact
- Station depth

- Gross characteristics of the surficial sediment
 - ◆ Texture
 - ◆ Color
 - ◆ Biological structures (e.g., shells, tubes, macrophytes)
 - ◆ Presence of debris (e.g., wood chips, wood fibers, human artifacts)
 - ◆ Presence of oily sheen
 - ◆ Obvious odor (e.g., hydrogen sulfide, oil, creosote)
- Gross characteristics of the vertical profile determined after the surficial sediments are collected
 - ◆ Vertical changes in sediment characteristics
 - ◆ Presence and depth of any apparent redox potential discontinuity layer
- Penetration depth

Before subsamples of the surficial sediments are taken, the overlying water must be removed. The preferred method of removing this water is by slowly siphoning it off near one side of the sampler. Methods such as decanting the water or slightly opening the sampler to let the water flow out are not recommended since they may result in unacceptable disturbance or loss of fine-grained surficial sediment and organic matter.

Once the overlying water is removed, the surficial sediment can be subsampled. Only sediments not in contact with the sides of the sampling device should be subsampled. It is recommended that subsamples be taken using a flat scoop. This device will allow a relatively large subsample to be taken accurately to a depth of 2 cm. Coring devices are not recommended because they usually collect inadequate amounts of surficial sediment and therefore require repeated extractions to obtain a sufficient volume of material for analysis of conventional sediment variables. A curved scoop is not recommended because it does not sample a uniform depth or volume with depth. Because accurate and consistent subsampling requires practice, it is advisable that an experienced person perform this task. Finally, sample contamination during collection must be avoided. All sampling equipment (e.g., scoops, containers) should be made of noncontaminating material and should be cleaned appropriately before use. It is recommended that all objects coming in contact with the sample be made of glass, stainless steel, or PTFE (e.g., polytetrafluoroethylene such as teflon). To avoid contamination, all sampling equipment should be cleaned in sequence with site water, pesticide-grade acetone, and pesticide-grade methylene chloride prior to initial use and between use for each station. Methylene chloride should be allowed to evaporate prior to using the equipment.

H.5.e Sediment Sample Homogenization

Sediment from single samples or composites of multiple samples should be homogenized prior to collecting subsamples. Compositing and homogenization can be accomplished by transferring sediment to a clean glass or stainless steel bowl and thoroughly homogenizing by stirring with stainless steel spoons or spatulas until textural and color homogeneity are achieved. The contents of the bowl should be continuously homogenized as subsamples are taken to prevent potential settlement of larger particles. In addition, unrepresentative material (e.g., stones, wood chips, seagrass) should be removed at the discretion of the chief scientist and noted in the field logbook. The bowl and all utensils should be cleaned in sequence with site water, pesticide-grade acetone, and pesticide-grade methylene chloride between composites and kept covered with aluminum foil to prevent airborne or other contamination. The methylene chloride should be allowed to evaporate prior to using the bowl and utensils.

All samples should be preserved according to the test requirements. In most cases, the samples are packed in ice and kept cold (4°C) and dark. Samples for toxicity testing should not be frozen.

H.5.f Collection of Sediment Chemistry Samples

If sediment chemistry samples are being collected concurrently with sediment toxicity test samples, they should be collected from the same homogenized sediment sample to ensure that the toxicity and chemical results are related as closely as possible. Sample homogenization and removal of bioassay aliquots should be conducted so that chemical aliquots are not contaminated in the process. Recommended sample size for chemical analysis is about 100 grams (i.e., about one cup) and samples should be placed into clean glass jars with teflon or aluminum cap liners. Sediment samples for chemical analysis can and should be frozen as soon as possible.

H.5.g Replication of Samples for Toxicity Testing

Replicate analyses are conducted on toxicity test subsamples to assess the variability encountered in laboratory testing, rather than the variability of sediment toxicity that exists in the field. To assess field variability, an alternate sampling design could be specified that requires each test replicate to be run on a separate replicate grab sample from each station. The primary drawback to this technique is that the single set of chemical concentrations usually measured at each station would not relate directly to the sediment toxicity measured in each replicate grab sample. This lack of direct relationship between toxicity test and chemical results can sometimes make data interpretation difficult for individual replicate samples. However, the mean toxicity test response could be compared directly with the chemical concentrations if the chemical measurements are made on a composite of equal amounts of sediment subsampled from each of the replicate samples used for toxicity test analysis.

H.6 Collection of Intertidal Sediments and Soils

Collection of intertidal sediments and soil samples is relatively straightforward because the samples do not have to rely on a remote sampling device. Detailed methods for sampling are provided in USEPA (1984; 1989). Many of the components of sediment and soil sampling are similar to those discussed in the previous section. Key differences include:

- Sampling interval - usually the top 5 cm of sediment are collected, or visual observations are used to select intervals;
- Grain size variations can be very large, from clay to boulders, making the sample more heterogeneous and requiring more replicates or composites;
- The level of contamination can be very high, so extreme care must be taken to avoid cross contamination. New core tubes or sampling utensils should be used for each sample; and
- Sites should be photographed prior to the collection of samples.

H.7 Tissue Sampling

Tissue samples are collected for either chemical or histological analysis. Organisms analyzed for petroleum hydrocarbons should be freshly killed. Decomposed organisms are rarely of any value for analysis. Field documentation should include detailed descriptions of the oiling conditions of the site, location, elevation, etc. Each organism should be photographed prior to sampling. For example, when collecting molluscs, overview photographs to document the exact location and substrate and close-up shots of clusters prior to sampling are valuable.

All instruments used in handling samples must be made of a non-contaminating material (e.g., stainless steel, glass, teflon, aluminum). Whole small organisms may be stored in clean glass jars. Large or irregularly shaped organisms may be wrapped in solvent-rinsed aluminum foil, placing the organism against the dull side. Tissue sections may be taken either on site from freshly killed organisms or in the laboratory from carefully collected and preserved samples. New, clean, sharp scalpels are used for tissue collection from each animal. The stomach and intestinal tract should be collected last to minimize contamination. Recommended sample size is 10-15 grams. Samples for chemical analysis should be kept at 4°C.

Samples for histological analysis should be about the size of a walnut and kept cold or preserved in the field. All samples from the same organism can go into a single bag. Preserved samples should be fixed appropriately. Trustees should consult with a pathologist regarding sample preservation.

H.8 Sample Shipment

Samples of oil and oiled sediments may often fall under the category of dangerous goods, also known as hazardous materials. Special packing and shipping procedures are required when dangerous goods are being transported. The U.S. Department of Transportation (USDOT) and the International Air Transport Association (IATA) are two major groups that regulate the transportation of dangerous goods. It is assumed that responders will ship oil-related samples via Federal Express (FedEx). FedEx follows IATA (1995) regulations. Trustees are referred to the IATA regulations for sample shipment.

H.9 References

IATA. 1995. Dangerous Goods Regulations, 36th edition: IATA, Montreal, Quebec.

Puget Sound Estuary Program. 1991. Puget Sound protocols: U.S. Environmental Protection Agency, Region 10, Office of Puget Sound, Seattle, WA.

U.S. Environmental Protection Agency. 1984. Sediment sampling quality assurance user's guide: Environmental Monitoring Support Laboratory, Las Vegas, NV.

U.S. Environmental Protection Agency. 1989. Soil sampling quality assurance user's guide, Review Draft: Environmental Monitoring Support Laboratory, Las Vegas, NV.

U.S. Environmental Protection Agency. 1991. Preparation aids for the development of Category IV Quality Assurance Project Plans: EPA/600/8-91/005, Office of Research and Development, Washington, DC.

Table of Contents

I.1 Timing and Notice of the Administrative Record	I-1
I.2 Purpose of the Record.....	I-1
I.3 Documents to Include in the Record.....	I-2
I.4 Documents Not Included in the Record.....	I-4
I.5 Compiling the Record	I-5
I.6 Facilitating Public Participation	I-7

I.1 Timing and Notice of the Administrative Record

Section 990.45 of the OPA regulations requires that a *publicly-available* Administrative Record (Record) be opened if trustees decide to conduct restoration planning pursuant to the OPA regulations. This means that trustees have made the required determinations of jurisdiction, likely injury to natural resources, and existence of feasible restoration alternatives for injured natural resources and/or services, and have determined that restoration planning should be pursued.

The Record must be opened concurrently with the trustees' issuance of the *Notice of Intent to Conduct Restoration Planning*. This Notice should be published in a public newspaper(s) or other circulation with distribution proportionate to the scope of the public affected by an oil spill incident. The Notice should indicate where the Record will be available for public inspection, and either list the times of availability or provide a contact person with whom interested members of the public can arrange to view the Record.

I.2 Purpose of the Record

If constructed and administered appropriately, the Record can serve several purposes:

- Provide a single repository for documents relied upon by trustees in making their determinations about restoration actions necessary and appropriate for a given incident;
- Provide a mechanism to facilitate public participation in the selection of restoration actions; and
- Provide a record for administrative or judicial review of trustees' actions and determinations.

These purposes can be achieved by giving careful consideration to the type, format, and timing of documents included in the Record. Trustees should reduce important decisions to writing, plan for meaningful organization for the Record, and provide uniform guidance to all personnel who are expected to receive or generate documents that should be included in the Record, among other things.

I.3 Documents to Include in the Record

The key criterion for determining whether a document¹ should be included in the Record is whether the document was relied upon by trustees in making their determinations about the appropriate type and scale of restoration needed to make the environment and public whole for injuries resulting from incidents. The deliberation and decisionmaking process of the trustees should be clear from a review of the Record. The Record should be explanatory, not merely conclusory. Therefore, options, actions, or interpretations considered but rejected by trustees should be included in the Record. In addition, if trustee policies or decisions that affect the direction or outcome of the NRDA are not normally memorialized in written form, consideration should be given to reducing these determinations to writing for the Record. For example, the Lead Administrative Trustee can develop a form that describes the date, trustees involved in a decision, subject of the deliberation, factors considered, if relevant, and final decision.

Documents that should normally be included in the Record include:

- All public notices required by, or made pursuant to, the OPA regulations;
- All notices, invitations, or other documents between trustees and RPs with respect to RP participation, comments on trustee determinations made pursuant to the OPA regulations, and requests for alternative assessment procedures, or other trustee-RP communications required by, or made pursuant to, the OPA regulation;
- All determinations trustees are required or encouraged to make under the OPA regulations, such as determinations of jurisdiction, likely injury, preliminary identification of feasible restoration alternatives, injuries to include in an assessment, selection of the most appropriate assessment procedures,² identification and evaluation of the range of restoration alternatives, etc.;
- Any applicable laws or regulations that affect the NRDA or OPA regulations that are not readily available to the public;

¹ "Document," for purposes of the Administrative Record, includes any form of information, such as data, pictures, electronic files, charts, etc.

² "Assessment procedures," for purposes of justifying the trustees' selection of the most appropriate procedures and for purposes of including workplans in the Record, should be interpreted broadly to include any analysis, test, or investigation performed at any stage of the assessment, from preassessment, emergency restoration, to restoration scaling.

- All workplans related to implementing the selected assessment procedures. The scope of a workplan will clearly depend on the scope and complexity of the incident, but at a minimum should identify the objective of the work, person(s) to carry out the work and their credentials, timeframe, and underlying assumptions for the procedure;
- Any quality assurance protocols or considerations relevant to the assessment procedures;
- Data generated from implementing assessment procedures, including output from any models or compensation formulas/schedules used (although the models or schedules themselves do not necessarily need to be included in the Record) if incorporated-by-reference);
- Existing data or literature used in making any determinations regarding injury or restoration;
- Final trustee conclusions drawn from assessment or investigative data;
- Reports compiled during preassessment or injury assessment activities (excluding reports prepared for purposes of litigation);
- The Draft Restoration Plan;
- Relevant literature relied upon that is not readily available to the public;
- Public comments and trustee responses to comments;
- Submissions made by the RPs that are not subject to confidentiality restrictions;
- Final coordination agreements among trustees or between trustees and the RPs;
- The Final Restoration Plan;
- The demand made upon the RPs to fund or implement the restoration plan, and their response; and

- Any final settlement agreement.

Documents prepared during the course of an NRDA should only be deposited into the Record once they are in final or “interim final” form. Documents unrelated to the particular incident that are in draft form but are relied upon by trustees in making injury assessment and restoration determinations should be included in the Record. In addition, draft versions of documents that are not finalized during the NRDA should be included in the Record if relied upon, and any draft documents made available for public review and comment should be included in the Record.

Submissions by the RPs: The OPA regulations encourage a very open, interactive assessment approach with the RP, with the goal of achieving prompt restoration without litigation. However, if a cooperative approach is not achieved, or does not lead to settlement, the Record should document the interaction between the parties and their points of agreement and disagreement. This may greatly facilitate judicial review of a trustee's claim for damages. Therefore, trustees should consider formally documenting their interactions with the RPs. Further, trustees should consider responding, either formally to the RPs or for the Record, to all documents or records that the RPs submit; such as comments received on trustee determinations or critiques of trustee assessment plans or analyses. Trustees are advised not to exclude submissions to the Record made by the RPs, but rather to document those submissions and report for the Record whether they were relied upon or not in the NRDA process.

I.4 Documents Not Included in the Record

Deliberative, pre-decisional documents: Personal notes, daily diaries, and internal agency deliberations that express opinions, advice, and recommendations of staff to other staff should not be included in the Record. However, if such deliberations result in a determination that affects the direction or outcome of the NRDA, the determination itself should be formally documented and included in the Record.

Documents related exclusively to liability: Unless relied upon in selecting injuries or restoration alternatives, documents related solely to the liability of certain parties should not be included in the Record.

Privileged documents, documents not releasable under government open records statutes: Documents covered by immunity from disclosure or an applicable privilege, such as attorney-client communications, should not be included in the Record. Therefore, if pertinent portions of such documents constitute information relied upon by trustees in making injury assessment and restoration determinations, then the appropriate portions of documents should be redacted, or the pertinent assessment material should be transposed into a new document. In the latter instance, the trustee should clearly indicate that the document is an excerpt from a withheld document, and identify the document and the justify withholding full disclosure.

I.5 Compiling the Record

Record coordinator or administrator: A single individual should be designated to coordinate collection of documents and their entry into the Record (e.g., Trustee Agency Coordinator or Administrative Specialist, refer to Appendix E). The trustee able to provide the location for the Record should typically function as Record coordinator, unless there is some logical reason to have another trustees (i.e., the LAT) serve in this capacity.

The Record coordinator should be a key member of the co-trustee NRDA team; familiar with documents that are being produced, records being received, or determinations made that need to be reduced to writing. The coordinator must devise a system for ensuring that all documents relied upon in making joint trustee decisions are collected from remotely-located personnel involved in the NRDA. The coordinator should distribute guidelines for record-keeping, such as clearly marking draft documents, and for delivery of documents for inclusion into the Record (i.e., provide quality assurance)

Compilation: Documents should be added to the Record as soon as they are submitted. However, depending on the scope and complexity of an incident, some trustees may not have adequate resources to dedicate personnel to maintaining a daily Record. In these situations, trustees may consider periodic updating of the Record, on a weekly or bi-weekly basis, for example. If trustees do decide to update periodically rather than instantaneously, the notice describing availability of the Record should describe the updating schedule. In addition, the Record coordinator must determine some mechanism to ensure that documents received but not entered are not misplaced prior to entry into the Record, such as a document log that may mirror the index to the Record.

Trustees should consider keeping two copies of each document in the Record that is available for public review. In addition, trustees may want to maintain an entire duplicate of the Record, perhaps consisting of the original copies of documents, in a non-public location.

Indexing: The index(ices) to the Record must facilitate public review, judicial review, and locating within the Record. Thus, a key component of an index will be a numbering system that facilitates filing and retrieval of documents. Numbering systems may vary with the needs of the particular incident. For instance, a simple incident may only require a chronological numbering system, assigning a single tracking number to a document as it is entered into the Record. More complex assessments may need nested indices with multiple numbers, for instance, a numeral to indicate the phase of NRDA or category of documents (e.g., turtle studies), and a second number to indicate chronological ordering of documents within a phase or category.

Other components may be included in an index to describe the documents, such as the title of the document, author, source, date, and type of document (e.g., literature reprint, data, still photographs).

Aspects of an index that will facilitate public review of the Record are discussed in the next section.

Closing the Record: After consideration of public comments received on the Draft Restoration Plan and issuing the Final Restoration Plan as a demand, trustees should officially close the Record for the Restoration Planning Phase. No documents should be entered into the Record after this time, except where such documents are offered by interested parties that did not receive actual or constructive notice of the opportunity to comment on the Draft Restoration Plan, do not duplicate information already contained in the Record, and raise significant issues regarding the Final Restoration Plan.

Availability of the closed Record: The Record for injury assessment and restoration planning should be available for public review until final settlement is reached, leading to restoration implementation, or until any litigation concerning damages based on the Final Restoration Plan is complete.

Record for implementation phase: Trustees may want to consider opening and maintaining a separate Administrative Record for the Restoration Implementation Phase. The primary objective of this Record is to keep the public informed of the progress of the restoration work. This Record should, at a minimum, document all decisions, actions, and expenditures taken by trustees during this phase, including any modifications made to the Final Restoration Plan and determinations of satisfactory completion of the plan.

The Record for the Restoration Implementation Phase should be opened, closed, maintained, and noticed for availability in the same manner as the Record for the Restoration Planning Phase.

I.6 Facilitating Public Participation

Section 1006(c)(5) of OPA requires that restoration plans be developed and implemented only after adequate public notice and consideration of all public comments. Public input is particularly relevant to trustee determinations regarding appropriate actions to make the environment and public whole for injuries to natural resources that are managed on behalf of the public.

In order to comply with this provision, the OPA regulations require that, at a minimum, trustees facilitate public review and comment on draft restoration plans that document the trustees' evaluation of feasible restoration alternatives and selection of a preferred alternative(s) for a given incident. Maintenance of an open Administrative Record will provide an expanded opportunity for involvement for those members of the public who are interested in more detail than may normally be included in draft restoration plans, such as raw data.

Attention to a few key aspects of a Record will enhance its accessibility to the public, such as the location of the Record, a user-friendly index to the Record, a system for document review, facilities for copying documents in the Record, and a mechanism for commenting on the Record.

Location: The Record should be maintained at a location readily accessible to a major segment of the public affected by, or expected to be interested in, the natural resources injured as a result of the oil incident, and at a facility open to the public. Space should be available that allows members of the public to conduct their review relatively free from disruptions, but that also allows the trustee to ensure the integrity of the Record.

Index to the Record: An index to the Record should be provided that facilitates public review. Documents in the Record should be organized or identified in a manner that clearly relates the decisionmaking process and highlights key NRDA determinations or other milestones. One obvious organization is chronologically within each phase of the NRDA; preassessment, restoration planning, and restoration implementation; perhaps with subcategories of injury assessment and restoration selection within the Restoration Planning Phase. Given that the OPA regulations require trustees to make numerous formal determinations, documents may be organized with respect to these determinations. Therefore, major categories in the index might include determination of jurisdiction, determination of likely resource injury, invitation to the RPs to participate in the NRDA, selection of injuries to include in the NRDA, preliminary identification of feasible restoration alternatives, and so forth.

The public index, which may be distinct from a more detailed index kept by the administrator of the Record, should group documents in categories that are meaningful to persons unfamiliar with NRDA's. Such categories may include identity and duties of trustees, response-phase activities of trustees, natural resource impacts investigated by trustees, methods for investigating natural resource impacts, restoration planning, etc.

The index must also provide document identification and location information, such as document number, or drawer number and document number, depending on the system employed by the trustee.

Reviewing documents: Trustees must devise a system that ensures that documents will not be lost, misplaced, or removed from the Record during public review. A simple, easily understood indexing and filing system, coupled with clear document identification, will help protect against misplacement. If sufficient personnel are available, trustees may require that members of the public select documents they would like to review from the index, then check those documents out from a Record custodian. Alternatively, some system to identify documents removed from the filing system must be devised, such as large checkout placards.

Trustees should keep a list of names and addresses of persons who personally inspect the Record, and consider mailing copies of the draft restoration plan to these individuals.

Copying documents: Trustees should institute a system that allows members of the public to copy documents in the Record, or arrange to have desired documents copied. Fees for copying to be facilitated by trustees or accomplished with government equipment must be determined prior to opening the Record, and should be prominently displayed in the Record review location. Government open records statutes are a likely source for determining appropriate copy costs for the public.

Public comments on the Record: At a minimum, trustees must provide a mechanism for members of the public to submit comments on a draft restoration plan, in which trustees describe the range of restoration alternatives considered, evaluate those alternatives according to the criteria provided in the OPA regulations, and identify their preferred restoration alternative(s). This process will likely consist of publishing a Notice of Availability of the draft restoration plan in appropriate newspapers, and describing the comment submission mechanism in the draft plan. Depending on the incident, trustees may also consider taking public comments during an open hearing or town meeting, which might necessitate recording equipment or trained recorders.

Trustees may also want to consider soliciting or accepting public input outside of the formal comment process related to the draft restoration plan. For example, comment forms may be made available in the area set aside for public inspection of documents. Depending on the significance of early comments and the need to fully document the basis for their NRDA decisions, trustees may decide to respond to these interim comments in writing as they are received, or they may defer response to a later official comment period. In this latter instance, the commenter should be informed that a response will be deferred.

All public comments received on the draft restoration plan, and any other document made available for public comment, must be included in the Record. Comments should be included in their original form; however, in responding to comments, trustees may consider summarizing and grouping like comments. Trustee responses must demonstrate that they did consider all comments, with particular attention to comments that go to matters that would change the outcome of the injury assessment or restoration planning process and final decisions.

Table of Contents

J.1 Introduction.....	J-1
J.2 Incentives for Coordination.....	J-1
J.3 Lead Administrative Trustee (LAT)	J-1
J.4 Co-Trustee Responsibilities.....	J-3
J.5 Co-Trustee Agreements.....	J-4
J.6 Coordination with Response Agencies	J-4
J.7 Coordination with the RPs	J-4
J.8 Trustee-RP Agreements.....	J-4
J.9 Coordination Among the RPs.....	J-5

J.1 Introduction

Trustee coordination is crucial to an efficient and effective NRDA process because of the need to address shared trustee interests in natural resources and services injured by incidents. OPA prohibits double recovery of damages, which strongly suggests that, where multiple trustees are involved in an incident, they actively coordinate their activities as early in the process as possible.

J.2 Incentives for Coordination

Incentives for coordination include:

- Access to funding - requests for reimbursement of the costs of initiating a NRDA from the Fund require that trustees attempt to coordinate their assessments and funding requests;
- Conflict resolution - lack of coordination among the trustees or with the RPs will likely produce an adversarial, litigation-charged atmosphere. A joint trustee-RP effort will help resolve legal, administrative, and technical conflicts; and
- Pooling limited resources - a joint trustee-RP effort will allow the pooling of financial and human resources for more efficient and effective restoration planning and implementation. Trustees will benefit greatly if coordination procedures can be established well before an incident occurs. However, cooperative arrangements allowing for RP implementation of NRDA activities are subject to trustee oversight because of the trustees' fiduciary responsibility to the public.

J.3 Lead Administrative Trustee (LAT)

When conducting joint assessments under the OPA regulations, trustees must designate a Lead Administrative Trustee (LAT). The LAT serves as the contact for trustee interaction with response agencies, RPs, and the public, and provides general administrative support to the restoration process. The LAT's responsibilities may include:

- Scheduling meetings of the trustees;
- Preparing agendas and procuring space or other needs for the meetings;

- Acting as a central contact point for the trustee agencies involved in the incident;
- Liaison with the appropriate OSC or designee;
- Coordinating preassessment data collection and analysis as well as other activities;
- Establishing and maintaining records for the trustees; and
- Contracting with consultants or experts to assist in the NRDA.

During an incident, Preassessment Phase coordination will depend greatly upon the complexity of the incident and NRDA activities. An oil-specific NRDA team may be established with members who can participate throughout the NRDA process. The most complex conditions will require a multi-level structure, such as that that evolved during the EXXON VALDEZ NRDA. When many trustees are involved in a complex NRDA, the overall management of the NRDA may be directed by a Trustee Council. This council may be composed of senior representatives from each trustee entity. The Trustee Council makes the final decisions on the type of damage assessment to be conducted, studies needed to support the claims, and final damage claim. There may be a designated LAT for the Trustee Council. If a trustee must act before a LAT is designated or Council is formed, the trustee should inform the designated LAT of all activities performed in order to facilitate future coordination.

Under the Trustee Council, special committees may be formed to deal with various aspects of planned injury studies, such as QA, economics, data management, analytical chemistry, legal issues, and restoration. The number of disciplinary study committees depends upon the natural resources affected (e.g., there may be committees for birds, fisheries, oil trajectory and fate, etc.). Members of the committees should include the principal investigator of each study, trustee representatives specializing in the natural resource or service, and experts. Each committee should elect a committee leader who takes responsibility for calling meetings, finalizing the agenda, distributing documents, chairing the meetings, and settling disputes. Legal representatives from each trustee would form a Trustee Legal Committee which would operate at an organizational level immediately below the Trustee Council. Both the Trustee Council and Legal Committee should be involved in determining the final damage claim. During the Preassessment Phase, it is essential that these committees form to minimize duplication of effort. Such coordination is best achieved through pre-incident planning.

For NRDA of lesser complexity, the trustees may form a single team with representatives from each trustee agency, technical staff who are conducting the studies (i.e., both scientific and economic), legal staff from each trustee, and also could include peer reviewers, and possibly the RPs. A LAT should be designated with the responsibilities as outlined above. This NRDA team should meet as soon as possible after an incident. The NRDA team reviews and approves all NRDA activities and assigns specific individuals or agencies as the lead for each activity. *Ad hoc* working groups can form to address special topics, such as data management and QA.

The OPA regulations do not require that a LAT be a Federal agency. However, when more than one Federal trustee(s) is involved, the Federal trustees must select a Federal LAT if the trustees wish to access the Fund to initiate NRDA activities. Where appropriate, the trustees may designate co-LATs, consisting of a Federal LAT and the State, tribal, or foreign trustees. Trustees may also elect to provide for sequential LATs to cover different stages of the NRDA process.

The LAT should be selected by mutual agreement of the trustees. In designating a LAT, trustees may want to consider such factors as:

- Relative extent of jurisdiction over natural resources and services injured by an incident;
- Capability and willingness to conduct NRDA actions; and
- Sequence and duration of involvement in the incident or similar incidents.

J.4 Co-Trustee Responsibilities

Co-trustees should be prepared to participate fully in the NRDA process by:

- Participating in or conducting those studies or analyses for which they have special expertise or management authority;
- Making staff available to participate in other NRDA activities; in particular, to represent the trustee in decisions requiring co-trustee unanimity; and
- Committing financial resources.

Each trustee may limit this participation based on the extent of injury to its natural resources as well as legal and financial constraints.

J.5 Co-Trustee Agreements

Trustees should consider Memoranda of Understanding (MOUs) to formalize their co-trustee relationships. The MOU or similar agreements may be prepared either in anticipation of an incident or shortly after an incident. It is important that trustee agreements address, at a minimum the:

- Purpose of the agreement;
- Trustee participants;
- Trustee organization; and
- A decisionmaking process.

J.6 Coordination With Response Agencies

To the fullest extent practicable without interfering with response activities, natural resource concerns should be integrated with response activities before pursuing a NRDA. Trustees are strongly encouraged to coordinate natural resource NRDA activities, such as gathering ephemeral data related to an incident, with response actions. Mechanisms to coordinate response and trustee data gathering needs and processes may also be addressed in pre-incident planning.

J.7 Coordination With the RPs

Under OPA, trustees have the responsibility to determine appropriate actions to restore injured natural resources and services. However, the OPA regulations require trustees to invite the RPs to be full or partial participants in the NRDA process, whenever it can be achieved without compromise of the trustees' statutory obligations to act on behalf of the public trust.

J.8 Trustee-RP Agreements

Trustees and RPs should consider entering into agreements to facilitate their interactions and resolve any disputes during the assessment. To maximize cost-effectiveness and cooperation, trustees and RPs may develop a set of agreed-upon facts concerning the incident and NRDA. For example, stipulated facts might concern the types of natural resources and services injured, the extent of injury, or the most appropriate assessment procedures to determine injury and/or restoration needs, and how the results of the procedures used will be interpreted.

J.9 Coordination Among the RPs

While it is obviously not as easy to identify the mix of potential RPs that will participate in a given incident, there are issues that can be addressed in general terms by the potential RPs in advance that will enable them to enter the cooperative restoration process more efficiently and effectively. In an incident with a single well-identified RP, the ability to assess the situation, identify the appropriate course of action, and most effectively implement a cooperative response will be improved by pre-incident planning. In an incident with multiple potential RPs, the need for pre-incident planning is more apparent. In this latter situation, the potential RPs need to consider the efficacy of a cooperative restoration process and the terms under which they would consider entering into such a process.

**INVITATION FOR THE RP TO
PARTICIPATE IN THE NRDA:
MODEL EXAMPLE**

APPENDIX K

[Date]

[Name of Responsible Party]
[Address]
[Telephone]
[Fax]
[email, if known]

Attention: [Representative, if known]

Re: [Name of Oil Spill Incident and date]: Invitation to Participate in Natural Resource
Damage Assessment

On [date], the [vessel name/facility] was involved in an actual or substantial threat of a discharge of oil [location]. You and/or your vessel, facility or corporation have been named by the United States Coast Guard as a responsible party for this incident, pursuant to § 2714 of the Oil Pollution Act of 1990, 33 U.S.C. § 2700 et seq. (OPA).

An incident involving an actual or substantial threat of a discharge of oil may give rise to liability for natural resource damages (NRD) under OPA and the regulations for assessing NRD pursuant to OPA, 15 CFR § 990 (61 FR 440, January 5, 1996; the OPA Regulations). The [names of trustee agencies participating in this letter] are Trustee agencies with management authority over natural resources actually or potentially injured as a result of this incident.

In accordance with § 990.41 of the OPA Regulations, the Trustees have determined that the incident is covered by OPA, that no exceptions from liability are applicable, and that natural resources under their trusteeship have been or may be injured as a result of this incident. The Trustees have therefore determined to proceed with the natural resource damage assessment process.

The goal of the assessment process is to efficiently and effectively restore injured natural resources and their services to baseline conditions, and compensate the environment and the public for the interim losses. As § 990.14 of the OPA Regulations requires Trustees to invite participation of known responsible parties in the assessment process to best facilitate achieving this restoration goal, this letter shall serve as your invitation to participate.

A written response from you is required by [date] to confirm your desire to participate in the assessment. Please send your response to [contact], of [agency], which is acting as the Lead Administrative Trustee for the assessment. The Trustees will subsequently contact you to determine a mutually acceptable level of your involvement in the assessment process, consistent with the provisions of § 990.14(c) of the OPA Rule.

Sincerely,

Title

Date