U.S. Department of the Interior

Natural Resource Damage Assessment and Restoration Federal Advisory Committee

Final Report to the Secretary

May 2007

Mission Statements

The mission of the U.S. Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the U.S. Department of the Interior's Natural Resource Damage Assessment and Restoration Program is to restore natural resources injured as a result of oil spills or hazardous substance releases into the environment. In partnership with other affected State, Tribal, and Federal trustee agencies, damage assessments provide the basis for determining the restoration needs that address the public's loss and use of these resources.

Cover Photographs

From upper left, clockwise:

Crissy Field, San Francisco Bay Tidal Wetland Restoration, CA – National Park Service

Tubbs Island Salt Marsh Restoration, CA – U.S. Geological Survey and U.S. Fish and Wildlife Service

Catclaw Sensitive Briar, one of many plant species affected by releases in various locations – U.S. Department of the Interior Natural Resource Damage Assessment and Restoration Program Office

San Luis Obispo Creek Bank Stabilization, CA – Land Conservancy of San Luis Obispo County

Butterfly, one of many types of insects affected by releases in various locations – Shannon Carlson

Great Blue Heron, one of many bird species affected by releases in various locations – Michael D. Phillips

Grizzly Bear, one of many terrestrial species affected by releases in various locations – Lee Carlson

U.S. Department of the Interior

Natural Resource Damage Assessment and Restoration Federal Advisory Committee

Final Report to the Secretary

committee chartered by the

U.S. Department of the Interior
Washington, D.C.

for the

Natural Resource Damage Assessment and Restoration Program
Washington, D.C.

prepared by the

Bureau of Reclamation
Technical Service Center
Denver, Colorado

May 2007

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, DC 20240

TAKE PRIDE IN AMERICA

JUL - 2 2007

The Honorable Dirk Kempthorne
Secretary of the Interior
U.S. Department of the Interior
1849 C. Street, NW
Washington, DC 20240

Dear Mr. Secretary:

I have the privilege of transmitting to you *The Final Report of the U.S. Department of the Interior Natural Resource Damage Assessment and Restoration Federal Advisory Committee*. This discretionary committee, chartered by the Department in May 2005 and convened under the Federal Advisory Committee Act, has worked diligently over the past 2 years to respond to the Department's request for advice on how best to optimize natural resource damage assessment and restoration activities.

The enclosed Final Report represents the unanimous consensus of the Committee. The Committee members took advantage of their diverse perspectives and experiences to develop and articulate a multi-phase approach that the Department could undertake to reduce case disputes, establish an early focus on cooperation and restoration during assessment activities, refine technical tools currently in use, and implement restoration more efficiently.

The Committee recommends the Department expeditiously prioritize and begin implementation of the recommendations. Building on the advances the Department and our co-trustees have already made, combined with the benefit of the recommendations I am transmitting today, the Department is well positioned to continue its leadership role in making the Restoration Program a model in restoration of injured natural resources in a more efficient and effective manner.

Sincerely,

Frank M. DeLuise

Frank M. DeLuise
Designated Federal Officer
Natural Resource Damage Assessment
and Restoration Federal Advisory Committee

Enclosure

Message From Deputy Secretary

"Thirty people representing government agencies, companies, universities, environmental and other organizations are recommending improvements in natural resource damage assessment and restoration. Reaching unanimous consensus is a great achievement, especially in light of how contentious these matters have often been in the past. This Federal Advisory Committee exemplifies the spirit of Cooperative Conservation.

These recommendations are not the end of a process; they present a new beginning. Now it is up to us in the U.S. Department of the Interior to build upon these unanimous recommendations, strengthen our partnerships, and continue restoring injured natural resources."

P. Lynn Scarlett, Deputy Secretary
U.S. Department of the Interior

Groups Represented on the Federal Advisory Committee

Federal Trustees
State Trustees
Tribal Trustees
Industrial Corporations
Industry Consultants
Private Law Firms
Local Environmental Groups
National Environmental Groups
Academic Institutions

(See Appendix C for Membership List)

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Appendices

Executive Summary

In May 2005, the U.S. Department of the Interior (DOI) chartered a Federal Advisory Committee to provide recommendations regarding its Natural Resource Damage Assessment and Restoration (NRDAR) activities, authorities, and responsibilities. The Committee, comprised of 30 members, represented a diverse group of interested stakeholders including State, Tribal, and Federal trustee agencies, and representatives of industry, academia, and environmental and public interest organizations.

The Committee Charter identified a number of specific objectives for advice on actions that can be undertaken to achieve faster, more efficient, and more effective restoration of injured natural resources and to promote cooperation among interested parties. The Committee has focused on actions within the purview of DOI's own authorities and responsibilities, rather than on actions involving obligations imposed on non-trustee Federal agencies, or State or Tribal entities.

Bottom Photograph—Qwuloolt Restored Estuarine Wetlands, Washington.

Top Photograph—Bald Eagle, one of many bird species affected by releases at various sites, including the Montrose Chemical Site, California.

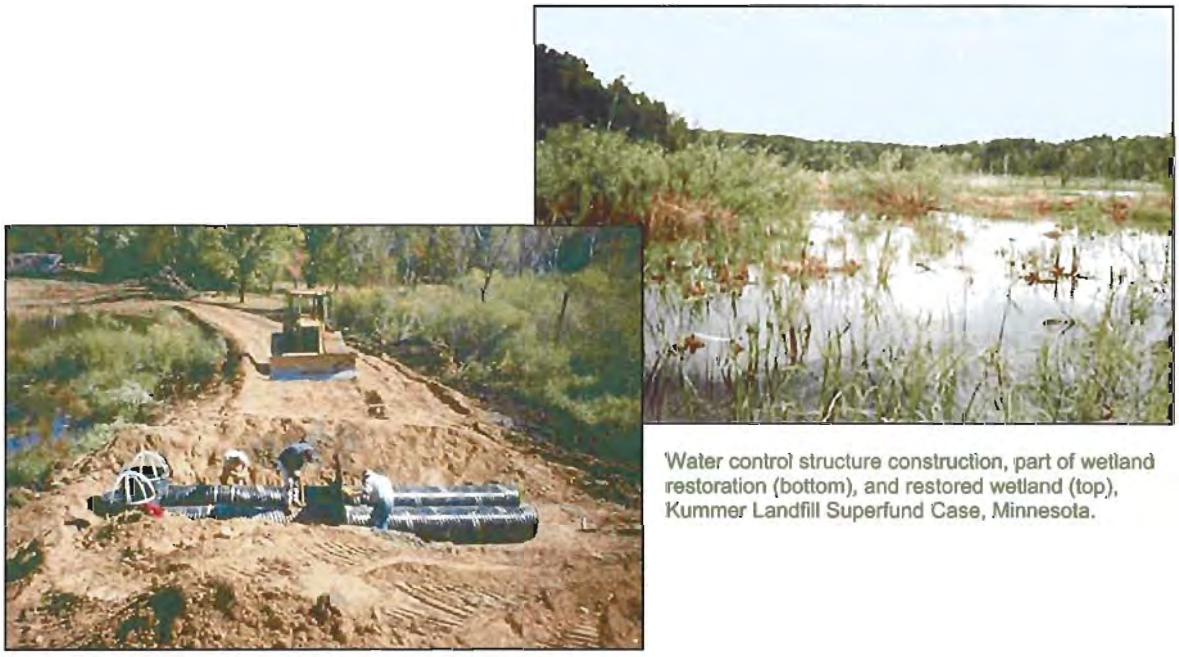
DOI asked the Committee to consider four major parts of the NRDAR process: (1) Natural Resource Injury Determination and Quantification; (2) Restoration Action Selection; (3) Compensating for Public Losses Pending Restoration; and (4) Timely and Effective Restoration *After* NRDAR Claims Are Resolved. These four issue areas were chosen because they address persistent critiques and contention surrounding the NRDAR program and they represent specific provisions in the current CERCLA NRDAR Regulations.

Subcommittees were formed to analyze each of the above topics and presented detailed reports with recommendations to the full Committee. The full Committee considered and discussed the Subcommittee reports in two public meetings. The Subcommittee reports were not adopted by the full Committee, but contain additional valuable discussions and are attached as appendices to this report. A drafting team was charged with synthesizing consensus recommendations derived from the Subcommittee reports and preparing a final draft report. The full Committee reviewed, revised, and adopted this report at a public meeting.

In brief, key full Committee recommendations are that DOI should:

- Explicitly authorize trustees to use a "restoration-based approach" for all natural resource damages, including interim losses.
- Adopt procedures that promote coordination between response and NRDAR activities.
- Encourage early and continued consideration of appropriate restoration options in the NRDAR process.
- Sponsor a series of workshops, research papers, and symposiums to inform guidance on explicitly linking the scale of restoration to the nature and extent of the injury.
- Ensure that compliance by Federal trustees with the requirements of the National Environmental Policy Act (NEPA) occurs concurrently with restoration planning.
- Identify and adopt Department-wide categorical exclusions from NEPA for appropriate types of restoration actions.
- Revise the existing criteria for evaluating restoration alternatives to provide clearer guidance that will enhance trustee decision-making.
- Enhance its NRDAR partnerships, through improvements in grants, cooperative agreements, and contracting, consistent with the goals of Cooperative Conservation.
- Encourage the use of existing local and regional restoration plans and databases for use in NRDAR.

The Committee strongly urges DOI to implement these recommendations expeditiously through the tiered approach described in the final section of the report.



Water control structure construction, part of wetland restoration (bottom), and restored wetland (top), Kummer Landfill Superfund Case, Minnesota.

Overview

Introduction

Natural Resource Damage Assessment and Restoration

Natural Resource Damage Assessment and Restoration (NRDAR) is the process used to determine whether public natural resources have been injured, destroyed, or lost as a result of a release of hazardous substances or oil, and to identify the actions and funds necessary to restore such resources. NRDAR is authorized by Federal statutes such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Clean Water Act (CWA), and the Oil Pollution Act (OPA). These statutes designate Federal, State, and Tribal government officials to act as "trustees" on behalf of the public to recover damages from responsible parties to restore injured, destroyed, or lost natural resources.

NRDAR is not a fine or punishment. It is a process to address the cost of certain types of environmental harm. "Fault" and "negligence" are not an issue under the above-referenced NRDAR statutes. In fact, damages are strictly compensatory, and are measured by the cost to restore, replace, or acquire resources equivalent to those injured or by the economic value of the injury. Trustees are also authorized to seek compensation for the losses the public sustains pending the completion of restoration actions. These losses consist of impairments in public use and enjoyment of natural resources. All recoveries must be used to restore, replace, or acquire the equivalent of injured natural resources.

DOI's Authorities and Responsibilities

The Secretary of the United States Department of the Interior (DOI) is designated to act as trustee, on behalf of the public, for NRDAR claims involving natural resources managed or controlled by DOI. This includes Federally-owned minerals, and Federally-managed water resources, migratory birds, anadromous fish, endangered species, marine mammals, national parklands, wilderness areas, national wildlife refuges, and the supporting ecosystems associated with these resources–as well as Indian reservations and Tribal resources when DOI is acting on behalf of a Federally-recognized Tribe. Additionally, the President has designated DOI–by virtue of its resource management expertise–to publish regulations pursuant to CERCLA, specifying "the best available procedures" for determining injury and appropriate restoration for natural resources harmed by releases of hazardous substances.

NRDAR Federal Advisory Committee

In May 2005, DOI chartered the NRDAR Federal Advisory Committee to provide advice and recommendations to DOI regarding its NRDAR activities, authorities, and responsibilities. The Committee was comprised of 30 members–representing a diverse group of interested stakeholders–including State, Tribal, and Federal trustee agencies, industry groups and potentially responsible parties, scientists and economists, and environmental and public

interest organizations. The Committee Charter and DOI Deputy Secretary P. Lynn Scarlett identified a number of specific overall objectives regarding the advice that DOI would seek from the Committee.

Objectives

The Committee was asked to advise DOI on actions that can be undertaken to achieve faster, more efficient, and more effective restoration of injured natural resources by promoting cooperation–in lieu of costly and time consuming adversarial processes–among natural resource trustees and potentially responsible parties. A key component of such an approach is emphasizing restoration of injured resources over litigation and monetary damages. Other important issues that the Committee was asked to examine in support of DOI's overall objective include coordination of NRDAR activities with other environmental protection authorities, the provision of clear procedures and standards for assessment reliability, and trustee accountability for the restoration and protection of public natural resources. A clear charge to the Committee from the outset was to focus on actions within the purview of DOI's authorities and responsibilities, rather than on actions that would require commitments of non-trustee Federal, State, or Tribal entities.

Fox River Restoration Area, Wisconsin.

Recommendations and Analysis

Introduction: The Four Questions

At the first meeting in November 2005, DOI asked the Committee to consider four discrete parts of the NRDAR process: (1) Natural Resource Injury Determination and Quantification; (2) Restoration Action Selection; (3) Compensating for Public Losses Pending Restoration; and (4) Timely and Effective Restoration After NRDAR Claims Are Resolved. In order to focus discussions, DOI proffered a specific practical question related to each phase of NRDAR.

Before (top) and after (bottom) restoration, San Luis Obispo Creek, California.

Question 1: Natural Resource Injury Determination and Quantification

What are the best available procedures for quantifying natural resource injury on a population, habitat, or ecosystem level, as set forth in the DOI NRDAR Regulations at 43 CFR 11.71(l)? What guidance is appropriate for the utilization of these procedures?

Question 2: Restoration Action Selection

Should DOI's NRDAR Regulations provide *additional* guidance–beyond the current factors to consider found at 43 CFR 11.82–for determining whether direct restoration, rehabilitation, replacement, or acquisition of equivalent resources is the best strategy for addressing natural resource injury?

Question 3: Compensating for Public Losses Pending Restoration

Should DOI revise the NRDAR Regulations to allow for compensating for interim losses with additional restoration projects in lieu of monetary damages for the economic value of the loss? If so, how should project-based interim loss claims be calculated?

Question 4: Timely and Effective Restoration After NRDAR Claims Are Resolved

What measures should DOI consider to expedite restoration planning and ensure cost effective and efficient restoration *after* awards or settlements are secured?

The Four Questions: Background

The four specific questions representing each phase of the NRDAR process arose in the context of over 20 years of NRDAR practice experience at DOI. That experience includes input from a broad spectrum of NRDAR stakeholders and recognition of legislative, regulatory, and policy developments since DOI promulgated the current version of the CERCLA NRDAR Regulation. Particular issues considered include:

NRDAR Practice Evolution

The Federal statutes that authorize NRDAR provide a framework that relies ultimately on an adversarial legal process for resolving claims. Nevertheless, more than 20 years of practice experience has shown–with few exceptions–that restoration of injured resources can be achieved more quickly, more efficiently, and more effectively by focusing on restoration in lieu of monetary damages, and on cooperative approaches to assessing and addressing injury. As NRDAR practice has evolved, consensus-based approaches to dealing with scientific uncertainty, clear restoration-based objectives, and close coordination with a broad spectrum of environmental protection and natural resource conservation interests and authorities have proven to be the most successful strategies for resolving claims and achieving restoration.

Ohio v. DOI

After DOI promulgated the original CERCLA NRDAR Regulations in 1986, they were challenged by a group of states, environmental groups, and industries. Ultimately, the D.C. Circuit Court of Appeals invalidated a key component of the rule that set damages as the lesser of restoration costs or the lost "value" of the resource. The Court concluded that "CERCLA unambiguously mandates a *distinct preference for using restoration cost as the measure of damages*." The Court also rejected the idea of a rigid hierarchy of permissible assessment methods. See *Ohio v. DOI*, 880 F.2d 432 (D.C. Cir. 1989).

Kennecott v. DOI

In 1994, DOI promulgated a revised CERCLA NRDAR Regulation conforming to *Ohio v. DOI*. In 1996, the D.C. Circuit Court of Appeals upheld nearly all aspects of the revised rule over challenges by industry groups and the State of Montana. The Court did find, however, that references to measuring appropriate restoration by looking at both the functions (or "services") the injured resources provided and the injured resources themselves were not adequately explained. DOI did state in the preamble to the 1994 regulation that it was not attempting any substantive change to its original approach, which provided that restoration is *performed* on resources themselves, but that the level of resource services provided is the yardstick for *measuring* how much restoration is needed. Therefore, the Court reinstated the original approach, while inviting DOI to clarify the issue. See *Kennecott v. DOI*, 88 F.3d 1191 (D.C. Cir. 1996).

OPA Regulations

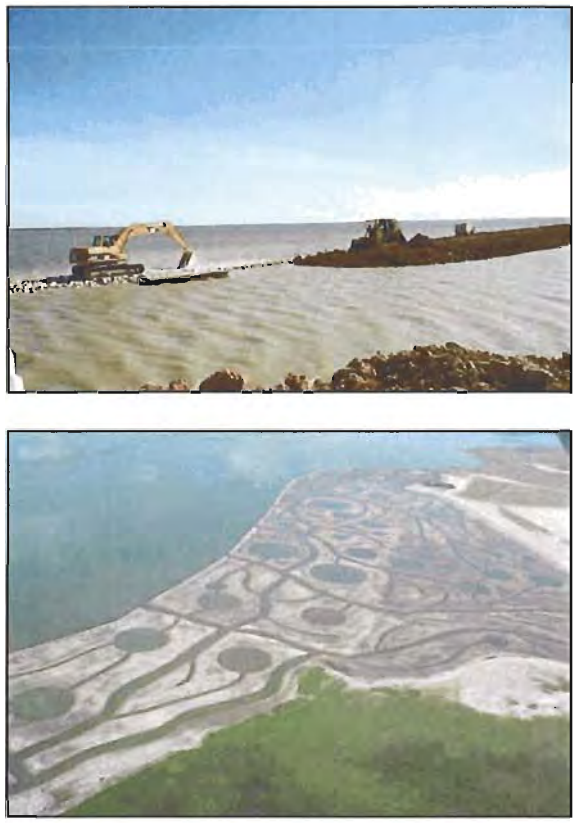
In 1996, NOAA issued final regulations for natural resource damage assessments for injuries resulting from oil spills, which are excluded from CERCLA. The Oil Pollution Act (OPA) Regulations at 15 CFR 990 share many conceptual similarities with the CERCLA NRDAR Regulations. A significant difference exists in how the respective rules treat compensation for interim losses pending restoration. Rather than including a damages component representing the economic *value* for interim losses, the OPA Regulations seek to focus the entire claim on the cost of implementing restoration projects that will both restore injured resources *and* compensate for lost human and ecological resource services pending restoration. Additionally, the OPA Regulations include specific guidance on integrating National Environmental Policy Act (NEPA) analysis into restoration planning and the utilization of existing restoration projects and regional restoration plans to address natural resource injuries when appropriate.

The CERCLA Reform Debate

In years past, as Congress has considered legislative proposals to reform CERCLA, interested parties have suggested modifications to the statute's natural resource damage provisions. These have included proposals to more explicitly link natural resource injury determination and quantification efforts to reliable and relevant data, to increase coordination of natural resource restoration and hazardous substance response actions, and to encourage a focus on restoration in lieu of economic damages.

CERCLA NRDAR Regulatory Review Issues

CERCLA requires DOI to review and revise the NRDAR Regulations as appropriate, every 2 years. A consistent theme in biennial reviews has been the utility of the basic framework of the CERCLA NRDAR Regulations. There has been support for conforming the regulations more closely to actual case practice–which includes a high percentage of negotiated settlements–and to increase coordination of restoration and response actions, but not for dramatic changes to the regulations. There has also been considerable interest in clarifying that the design and scale of restoration actions need not be based on economic studies if reliable, cost effective ecological metrics are available for all losses.



Marsh construction (top) and created marsh (bottom), Lavaca Bay, Texas.

Cooperative Conservation

In 2004 President Bush issued an Executive Order calling for the integration of Cooperative Conservation principles into resource management agency missions, policies, and regulations. For NRDAR that meant taking steps to ensure that restoration actions are closely coordinated with the conservation efforts of local governments, landowners, communities, environmental groups, land trusts, industry, and other parties to protect, enhance, and restore water, air, fish, wildlife, and other natural resources. The integration of NRDAR and Cooperative Conservation has great potential to leverage success and result in more effective, efficient, and sustainable natural resource restoration and protection.

Cooperative Conservation principles are simple. Cooperative Conservation is:

- **Voluntary and Incentive-based**: People associate together voluntarily to pursue common conservation goals.
- **Collaborative**: Problems are solved by people working together.
- **Rooted in Local Action**: Cooperative Conservation is enhanced through local, experiential knowledge as well as science.
- **Non-partisan**: Cooperative Conservation offers a way to transcend litigation and polarization that might otherwise divide Americans.
- **Entrepreneurial**: Innovation and creativity by citizens drive Cooperative Conservation problem solving.

Source: Cooperative Conservation Listening Sessions Final Report

Before (top) and after (bottom) invasive species eradication, Great Swamp National Wildlife Refuge, New Jersey.

Consideration of the Four Questions

Question 1: Natural Resource Injury Determination and Quantification

What are the best available procedures for quantifying natural resource injury on a population, habitat, or ecosystem level, as set forth in the DOI NRDAR Regulations at 43 CFR 11.71(l)? What guidance is appropriate for the utilization of these procedures?

Background

Reliable natural resource injury determination and quantification are basic steps in the implementation of practical and successful NRDAR. Although there is significant consensus among scientists concerning the use of increasingly sophisticated techniques for detecting the presence and effects of hazardous substances on biota, NRDAR injury determination and quantification issues can still generate controversy at some sites. Although the mere presence of hazardous substances or oil is not sufficient to support a claim for NRDAR, there are disagreements as to the types and levels of adverse affects that are appropriate to address.

The CERCLA NRDAR Regulations define a wide variety of biological responses at the organism, or even the sub-organism level as "injury." After the presence of injury has been determined, the regulations then provide for "quantification" of the injury for use in determining appropriate restoration (43 CFR 11.71(l)(4)(ii)).

The concept of "baseline" is critical to quantifying natural resource injury. The regulations define baseline as "the condition or conditions that would have existed *at the assessment area* had the discharge of oil or release of the hazardous substances under investigation not occurred," and suggest that the extent to which an injured biological resource differs from baseline should be determined by analysis of "the population or the habitat or ecosystem levels."

There has been considerable confusion and uncertainty among practitioners over the application of these terms to the NRDAR paradigm. The regulations do not define "population, habitat, or ecosystem," and although these terms represent well known concepts in ecological science, their precise meaning can be highly contextual. At any site, it can be difficult to determine the relevant "population, habitat, or ecosystem." For example, one may refer to the entire population of a species, or to the population of a species that lives and reproduces in a region, or in a single pond or lake. Similarly, habitat can be identified in a discrete localized area or in a forest that spans two time zones; and ecosystems may be contained within a discrete boundary or span an entire ocean.

Some suggest that the words "population, habitat, or ecosystem" represent a "bright-line test" for NRDAR because these higher levels have greater ecological relevance.

While it is inappropriate to extrapolate injury to individual organisms to population or ecosystem levels without supporting evidence, the main purpose of injury quantification is to determine the amount of restoration appropriate to compensate for the magnitude of the injury, not to conduct unnecessary studies that do not inform decision-making. Accordingly, some believe that assessments should be conducted at a level of biological scale–whether individual organisms, populations, sub-populations, communities, habitats, or ecosystems–that is reliable, cost effective, and relevant to appropriate restoration to address the injuries manifested at the site.

Injury quantification at simpler levels of biological scale generally is less costly and time consuming than studies conducted at higher levels of complexity, such as populations, communities, or ecosystems. Although quantification at simpler levels yields data that can be interpreted with greater certainty regarding some losses, it may be less informative regarding losses at a more complex level of biological scale. Accordingly, injuries at lower levels of biological scale are addressed with restoration commensurate with that level, and injuries at higher levels of biological scale are addressed with more comprehensive restoration.

Recommendations

- DOI should sponsor a series of technical workshops, research papers, and symposiums to assist in the development of guidance documents–and potential regulatory revisions–on injury quantification. These efforts should focus on providing the information needed for the development of guidance to NRDAR practitioners on selecting the appropriate level of biological scale (*i.e.*, individual organisms [particularly in the case of threatened or endangered species, or Tribal natural resources], populations, communities, ecosystems, as well as habitats manifested at a site) for quantifying injury for the purpose of determining appropriate restoration at particular sites.

- Under the current CERCLA NRDAR Regulations, injury quantification should provide a foundation for restoration action selection. Any guidance proposals put forward by DOI should clearly direct NRDAR efforts towards reliably connecting injury quantification information developed for a site to determinations regarding appropriate restoration actions.

- DOI should provide guidance on how to define variable terms–such as population, community, ecosystem, and habitat–in the context of NRDAR, which focuses on conditions at impacted sites.

- Guidance issued by DOI on injury determination and quantification should not be overly prescriptive, and should be issued in a form that is easily updated to account for the evolution and development of scientific and technical methodologies. To ensure accuracy and broad acceptance, guidance should be subject to peer review, and be sufficiently flexible to address the diversity of habitats, natural resources, and contaminants that are manifested at NRDAR sites.

Analysis

The CERCLA NRDAR Regulations and the underlying statute make clear that the purpose of injury quantification is the provision of useful data for restoration planning. (See, *e.g.*, 43 CFR 11.70(b)). Quantifying natural resource injury in a manner that supports reliable restoration planning can be a highly complex technical issue. Hazardous substance releases that result in nominal habitat impairments, affecting a relatively small number of organisms at a site, can in most cases, be addressed with a nominal amount of corresponding habitat improvement. At larger, more complex sites, however, confounding factors can come into play. Individual organisms may migrate or disperse into and out of a site at various intervals. Adverse impacts to habitat or organisms at a site may be caused by a combination of factors–such as development, pesticide use, and soil erosion–in addition to hazardous substance releases. Disagreements may arise over what quantity of impacted organisms or habitat functions are necessary to support a proposed scale of restoration activities.

Some believe that the regulation's endorsement of "population, habitat, or ecosystem" analyses represents a "bright-line" test for whether an injury is ecologically relevant, and thus appropriate to be addressed with restoration actions. Others believe that position is contradicted both by the collective phrase "population, habitat, or ecosystem" and–more importantly–the regulation's definition of "baseline." They note that baseline is defined as the conditions that would have existed *at the assessment area* had the releases in question not occurred. In their view, the regulation sets the appropriate context for analyzing "populations, habitats, or ecosystems" as conditions at the *assessment area* itself, not conditions at the outer bounds of what could be defined as a "population" or an "ecosystem." They also believe the parallel regulatory suggestion to utilize "habitat" analyses undercuts the argument for focusing exclusively on more complex or comprehensive levels of biological scale since habitat can be provided by extremely small geographic units, which can be reliably determined to be degraded if their productivity–in terms of food, cover, resting areas, etc.–is reduced, or if they become a source of toxicity to living organisms. More importantly, they assert, CERCLA does not establish a significance threshold for injury that must be met before restoration can be undertaken.

The workshops recommended by the Committee can help resolve some of these issues by focusing on reliable injury assessment and quantification that is clearly and transparently tied to appropriate restoration objectives. The workshops may also result in rectifying some issues regarding the generation and utilization of data for ecological risk assessment purposes for CERCLA response actions, and the generation and utilization of the same data for the NRDAR.

Vine Street Wetland Restoration, Vermont.

Question 2: Restoration Action Selection

Should DOI's NRDAR Regulations provide *additional* guidance–beyond the current factors to consider, found at 43 CFR 11.82–for determining whether direct restoration, rehabilitation, replacement, or acquisition of equivalent resources is the best strategy for addressing natural resource injury?

Background

CERCLA provides that trustees must use natural resource damages to "restore, replace, or acquire the equivalent" of injured natural resources. The CERCLA NRDAR Regulations do not express a preference among these various types of restoration actions. Instead, the regulation includes a list of relevant factors for trustees to consider in evaluating proposed restoration actions. These factors and the process they represent have been judicially reviewed and upheld. More importantly, they provide trustees with broad discretion to tailor restoration actions to the unique circumstances of a site. Nevertheless, over 20 years of practice experience suggests that DOI can provide additional constructive guidance on developing and selecting among potential restoration alternatives.

Recommendations

- DOI should revise the CERCLA NRDAR Regulations list of relevant factors to clarify the importance of "threshold" factors regarding legality, reasonable likelihood of success, and a demonstrable relationship between the restoration alternative and the injury.

  The remaining "balancing factors" should be revised to: (a) require trustees to consider the strength of the relationship between a restoration alternative and injured natural resources; (b) incorporate a preference for actions that have long-term, sustainable benefits to natural resources and services; (c) clarify other criteria in light of the trustees' experience since the criteria were promulgated; and (d) where practicable, conform selection factors to those in the OPA rule.

- In order to encourage a restoration focus in the NRDAR process, trustees should begin thinking about potential opportunities for appropriate restoration and the information needed to develop and assess restoration alternatives from the early phases of the NRDAR process. In order to highlight the need to encourage an initial focus on restoration, several parts of the regulation should be revised to encourage early scoping of restoration opportunities.

- DOI should consider changes to the NRDAR rule and provide guidance to improve coordination between hazardous substance response and damage assessment and restoration activities, including efforts to achieve a common database and collective identification of data needs and gaps.

- DOI should publish additional guidance–informed by actual case experiences–to further assist trustees in developing and evaluating both on-site and off-site restoration alternatives.

- DOI should develop guidance on the appropriateness of human use (including cultural) service restoration projects, such as research or educational programs, recreational amenities, and the stocking of sport fish.

- DOI should affirmatively recognize that projects providing cultural services may be appropriate where cultural uses are lost, even with a more attenuated link to natural resource enhancement or protection than would be appropriate in other circumstances.

- DOI should undertake an initiative to promote "Cooperative Assessments" emphasizing joint injury determination and quantification and restoration selection activities with potentially responsible parties.

Fishway to restore passage for migratory fish, New Bedford Harbor Superfund Case, Massachusetts.

Analysis

Some restoration proposals have raised questions about consistency with the trustees' statutory mandate to restore, replace, or acquire the equivalent of injured resources. For example, proposals to build community centers, parking lots, education facilities, or aquariums have attracted strong support from local community members or trustees, but may require careful analysis to determine whether they have an appropriate relationship to injured natural resources. Similarly, there have been suggestions that additional guidance on evaluating the appropriateness of on-site and off-site restoration of natural resources would be helpful. In addition, some have expressed uncertainty about how to restore cultural uses of natural resources consistent with applicable NRDAR requirements.

The Committee generally supports a restoration selection approach that provides the discretion necessary to deal with conditions at individual sites, and does not involve wholesale overhaul of existing regulations. However, a few targeted revisions may be desirable to improve the quality of decision-making. If DOI undertakes a comprehensive revision of the current CERCLA NRDAR Regulations, the Committee recommends that refinements to the existing selection factors should be included. The Committee also recommends a number of targeted revisions to the regulations to encourage an earlier focus on appropriate restoration alternatives. Lastly, the Committee believes guidance on some specific restoration action selection issues could improve and accelerate trustee decision-making.

Question 3: Compensating for Public Losses Pending Restoration

Should DOI revise the NRDAR Regulations to allow for compensating for interim losses with additional restoration projects in lieu of monetary damages for the economic value of the loss? If so, how should project-based interim loss claims be calculated?

Background

CERCLA authorizes natural resource trustees to recover damages not only for the cost of restoring injured resources to the "baseline" condition that would have existed had the hazardous substance releases in question not occurred, but also for the loss of natural resource services that otherwise would have been provided to the public by the resources pending the re-establishment of baseline ("interim losses"). Under the existing CERCLA NRDAR Regulations promulgated by DOI, damages for interim losses are equal to the *economic value* the public loses until the baseline condition is re-established. The existing regulations call this "compensable value." (See 43 CFR 11.83(c)). CERCLA requires trustees to spend any compensable value recoveries to restore, replace, or acquire the equivalent of an injured natural resource.

In 1996, the NRDAR Regulations under OPA authorized trustees to identify the restoration actions they intend to take to address interim losses before a demand is presented to potentially responsible parties. Damages for interim losses are then computed based on the cost of those actions, rather than on the monetary value of the interim losses. This promotes an early focus on feasible restoration rather than monetary damages, and can result in lower overall restoration costs when high-value, cost-effective projects are utilized to address interim losses.

Recommendations

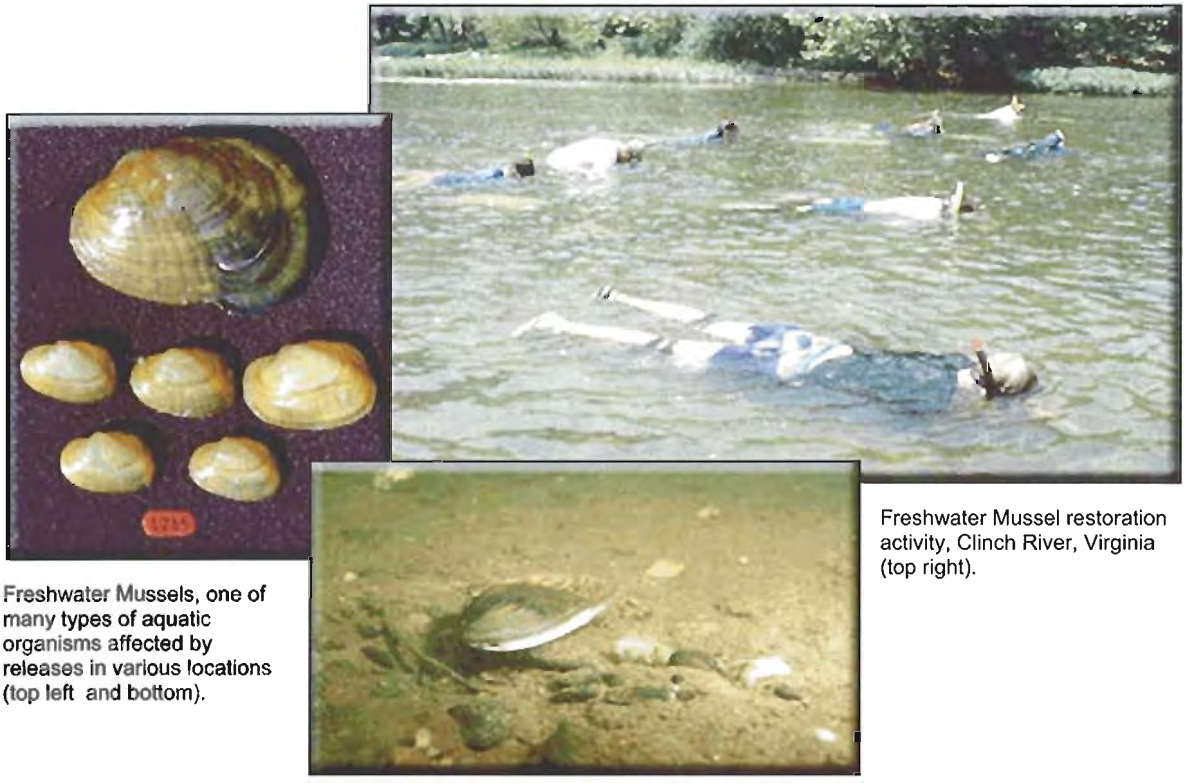
- DOI should undertake a targeted revision of the regulation to make clear that it is appropriate to calculate compensation for interim public losses pending natural resource restoration based on the cost of restoration projects that can provide human and ecological services equivalent to those that have been lost, rather than requiring economic studies of the monetary value of the lost services as the exclusive measure of damages.

- The flexibility to adopt a restoration-based approach for interim losses should not, however, modify the current regulation's focus on baseline, causation, services (both human and ecological), and utilization of reliable assessment methodologies. Because methodologies evolve, DOI should not specifically sanction or bar any particular methodology for calculating interim losses, but should set out general principles of reliability that all methodologies are expected to satisfy. It is important for DOI to consider the standards for reliability embodied in the Federal Rules of Evidence and the often novel scientific and technical issues confronted in NRDAR.

Analysis

The current CERCLA NRDAR Regulations specifically provide that interim public losses pending restoration are measured by "changes in consumer surplus, economic rent, and any fees or other payments collectable by a Federal or State agency or an Indian Tribe …and any economic rent accruing to a private party…" (43 CFR 11.83(c)(1)). This could arguably be read to preclude the use of restoration-based approaches to resolve claims for interim losses. Many NRDAR practitioners believe that the ability to utilize restoration-based approaches to resolve claims for interim public losses pending restoration–as the OPA rule provides–can have many advantages. It can promote an early focus on restoration actions to address natural resources, and provide the flexibility to use simpler, more cost effective, and more transparent methods to relate natural resource damage claims to restoration, rather than monetary damages. Moreover, a restoration-based approach to interim public losses better comports with CERCLA's overall restoration objectives.

It is important, however, for DOI to ensure that any regulatory revisions to promote flexibility to utilize restoration-based damage assessment methodologies not be perceived as an invitation to utilize unreliable or irrelevant assessment methodologies, simply because their endpoints can be described as a restoration action. Accordingly, our recommendation provides for both flexibility to utilize restoration-based approaches, and general principles for trustees to consider when evaluating the reliability of all damage assessment methodologies.



Freshwater Mussels, one of many types of aquatic organisms affected by releases in various locations (top left and bottom).

Freshwater Mussel restoration activity, Clinch River, Virginia (top right).

Question 4: Timely and Effective Restoration After NRDAR Claims Are Resolved

What measures should DOI consider to expedite restoration planning and ensure cost effective and efficient restoration *after* awards or settlements are secured?

Background

The ultimate objective of NRDAR is the restoration of injured resources, not the development of legal claims. However, the current CERCLA NRDAR Regulations have relatively little to say about restoration planning and implementation *after* natural resource damage awards or settlements are secured. The CERCLA statute requires trustees to develop and adopt restoration plans before funds are expended for restoration (42 USC 9611(i)). The regulations provide that restoration plans should be made available for public comment before implementation (43 CFR 11.93). There is little additional guidance, however, on dealing with restoration planning and implementation obligations that exist outside of the CERCLA framework, such as the requirements of the NEPA, trustee agency procurement, grant, and cooperative agreement protocols for restoration implementation actions, and the relationship of NRDAR to pre-existing resource management plans and priorities.

Recommendations

- DOI should create and maintain an accessible and easily updated inventory of restoration actions and categories of restoration actions that trustees can use for restoration planning activities. This inventory could include data and information from existing regional restoration plans, species recovery plans, watershed plans, habitat action plans, local and regional conservation group priorities, etc.

- DOI should develop NRDAR-specific guidance to integrate Cooperative Conservation principles into restoration planning and implementation. The process to develop this guidance should include initiatives to minimize any barriers to partnerships with local governments, conservation groups, land trusts, and other entities that share trustee restoration goals and have the capability to assist in restoration implementation. DOI should consolidate restoration planning and implementation guidance in a publicly available "Restoration Handbook" that could include chapters on the restoration planning process, integrating restoration planning with other statutory, regulatory, and administrative requirements, partnering, financial and business practices, etc.

- DOI should take affirmative steps to ensure that compliance by Federal trustees with the requirements of the NEPA occurs *concurrently* with restoration planning, and is not undertaken as a consecutive, repetitive administrative burden. Accordingly, DOI should consider revising the CERCLA NRDAR Regulations at 43 CFR 11.93 to clarify that completion of the

restoration planning process set forth in the regulations was intended to meet the requirements of NEPA. Additionally, any regulatory revisions should make clear that when trustees utilize restoration actions from pre-existing plans that have already undergone NEPA analysis, that analysis can be incorporated into the NRDAR restoration planning process.

- To further reduce administrative redundancy and inconsistency regarding the integration of restoration planning and NEPA compliance, DOI should review the current relevant bureau-specific categorical exclusions for natural resource restoration, and consider adopting them Department-wide. This will promote NRDAR-program specific consistency, transparency, and efficiency in restoration planning involving DOI.

Analysis

The goals and objectives of NRDAR and NEPA are strongly in accord. The NRDAR process promotes the restoration of natural resources injured or destroyed by releases of hazardous substances or oil. The express purpose of NEPA is to "prevent and eliminate damage to the environment" and to enrich the understanding of "ecological systems and natural resources." The Council on Environmental Quality's NEPA Regulations provide that the intent of the NEPA process is to assist public officials in taking actions that "protect, restore, and enhance the environment" (40 CFR 500.1(c)). Moreover, the NEPA Regulations specifically call for NEPA analysis to run "concurrently rather than consecutively" with other planning and environmental review procedures, as recommended in this report (40 CFR 1500.2(c)).

DOI should endeavor to provide trustees with a detailed road map for getting from shared overarching goals and concurrent processes to effective and efficient restoration planning. DOI should consider revising the CERCLA NRDAR Regulations' restoration planning provisions to provide enough detail to make clear that the CERCLA restoration planning process is also "functionally equivalent" to NEPA analysis.

Ruddy Duck (top) and Common Loon (bottom), two of many bird species affected by releases in various locations.

Of course, the restoration and protection of natural resources and ecological integrity are not only matters of statutes, laws, and regulations. That is why DOI should take steps–consistent with the President's Executive Order on Cooperative Conservation–to ensure that NRDAR restoration actions are coordinated–and to the extent practical, integrated–with the conservation efforts of local governments, landowners, communities, environmental groups, land trusts, industry, and other parties to protect, enhance, and restore water, air, fish, wildlife, and other natural resources. This integration of NRDAR and Cooperative Conservation has great potential to leverage success and result in more effective, efficient, and sustainable natural resource restoration and protection.

Series of photographs depicting streambank erosion (top), streambank construction to eliminate erosion problems (middle top), post construction (middle bottom), and post restoration (bottom) of Silver Bow Creek, Montana.

Implementation of Recommendations

Priorities and Timing

At the outset, DOI told the FACA Committee that it should concentrate on issues and reforms that were within the purview of DOI's authorities and responsibilities, so DOI could focus its efforts on taking beneficial actions rather than formulating positions on how other governmental entities exercise their authorities. This pragmatic approach could also serve DOI well in undertaking implementation of the recommendations put forward in this report, which include a mix of administrative, guidance-based, and regulatory reform actions. Prioritizing recommendations according to the ability to execute them in a timely manner will allow DOI to continue the momentum created by the Committee's activities, and most accurately reflects the major theme of this report–the application of incremental improvements to a fundamentally sound process.

To that end, we would recommend that DOI consider "tiering" implementation of the recommendations found herein. Tier 1 represents activities that could be undertaken immediately. It would include sponsoring technical workshops, research papers, and symposiums to assist in the development of guidance documents on injury determination and quantification (Question 1); the promotion of cooperative assessments through initiatives like developing model agreement language with PRP groups, creation of an inventory of pre-existing plans for restoration actions and categories that trustees can use for restoration planning, and the publication of NRDAR-specific guidance on integrating Cooperative Conservation principles into restoration planning and implementation activities (Question 4).

Tier 2 actions should also be undertaken almost immediately, but may require more time to fully implement. Tier 2 activities include ensuring that NEPA compliance occurs concurrently with restoration planning. It also includes the adoption of Department-wide NRDAR-specific categorical exclusions from NEPA analysis (Question 4); and a targeted regulatory revision to clarify the appropriateness of a restoration-based approach for all natural resource damages (Question 3). This revision could also provide DOI with the opportunity to more clearly explain issues regarding the difference between restoration to address injured or destroyed resources and restoration to compensate for lost services pending resource restoration that led to confusion when the D.C. Circuit Court of Appeals last reviewed the CERCLA NRDAR Regulations in the *Kennecott* decision.

Tier 3 actions–which would entail a longer timeline for implementation–include many of the Question 2 recommendations and a more extensive revision of the CERCLA NRDAR Regulations, to make the regulation more understandable, while maintaining consistency with sound scientific and economic principles.

Conclusion

The history of the NRDAR Program has shown that cooperative approaches result in faster, more efficient, and more effective natural resource restoration. This FACA Committee's intensive examination of NRDAR practice, methodologies, and protocols among representatives from all interested stakeholders, in an open public forum, has been an example of the kind of thoughtful interaction that Cooperative Conservation involves. As this Committee completes its charge and draws to a close, we encourage DOI to continue to reach out to State and local governments, Tribes, other Federal agencies, industry, environmental groups, and academics, and extend the spirit of our efforts and to establish its NRDAR Program as a model of Cooperative Conservation in action.

Partnership sign, Coakley Landfill Restoration, New Hampshire.

Glossary of Key Terms

All terms used in this report are as defined in the current CERCLA/CWA NRDAR Regulations, CERCLA, or the NCP. The glossary below includes a working definition, for the purpose of this report only, of terms not otherwise defined.

Assessment – a natural resource damage assessment.

Baseline – the condition or conditions that would have existed at the assessment area had the discharge of oil or release of the hazardous substance under investigation not occurred.

Baseline restoration – action to address the impaired condition of natural resources themselves by restoring those resources to their baseline condition through direct restoration, replacement, or acquisition of equivalent resources. Baseline restoration is one of two potential components of a restoration action (interim loss restoration being the other).

CERCLA – the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC 9601-9607).

Clean Water Act or CWA/FWPCA – the Federal Water Pollution Control Act (33 USC 1251-1321).

Community – a group of populations of plants and animals in a given place.

Economic value – the quantity of something, usually dollars, that a person is willing to forego to obtain something else. There are two types of economic values: active use values and passive use values.

Ecosystem – a biotic community and its abiotic environment.

Federally-permitted release – a category of release exempt from liability under CERCLA (42 USC 9607(j)). The term covers, for example, releases authorized by a permit issued under a Federal pollution-control statute (*e.g.*, a National Pollutant Discharge Elimination System–NPDES–permit under the Clean Water Act).

Interim loss – the loss of services that would have otherwise been provided to the public by injured natural resources during the period before baseline conditions are achieved.

Interim loss restoration – action to address interim loss. Interim loss restoration is one of two potential components of a restoration action (baseline restoration being the other).

National Contingency Plan or NCP – the National Oil and Hazardous Substances Pollution Contingency Plan, promulgated by EPA pursuant to section 105 of CERCLA and codified in 40 CFR 300.

National Environmental Policy Act or NEPA – 42 USC 4321.

Nonbiological resources – geologic resources, groundwater, surface water, sediment, and air under trusteeship.

Oil Pollution Act or OPA – 33 USC 2701-61.

Passive use values – one of two types of economic values (the other being active use value). Passive use values are economic values a person holds for knowing a natural resource exists or will be available for future generations, regardless of whether that person actively uses the resource.

Population – Organisms of a particular species in a relevant area.

Potentially responsible party – a person who may be liable for natural resource damages under CERCLA, 42 USC 9607(a), or the Clean Water Act, 33 USC 1321(f)(1)-(3).

Release – this term is defined in CERCLA, 42 USC 9601(22). This report generally uses release to mean both "release" as used in CERCLA and "discharge" as used in OPA and the Clean Water Act.

Restoration – any of the actions–including "restoration," "replacement," "rehabilitation," or "acquisition of equivalent resources"–that CERCLA, OPA, or the Clean Water Act authorize trustees to fund with recovered natural resource damages. Restoration potentially includes both a baseline restoration component and an interim loss restoration component.

Services – the physical and biological functions performed by resources, including the human use of those functions. These services are the result of the physical, chemical, or biological quality of the resources.

Appendix A

Subcommittee Reports

Question 1/Subcommittee 1: Natural Resource Injury Determination and Quantification

Question 2/Subcommittee 2: Restoration Action Selection

Question 3/Subcommittee 3: Compensating for Public Losses Pending Restoration

Question 4/Subcommittee 4: Timely and Effective Restoration After NRDAR Claims Are Resolved

U.S. Department of Interior

Subcommittee #1 Final Report to

Federal Advisory Committee on Natural Resource Damage Assessment and Restoration

Members:

Will Clements

Barbara Goldsmith

Lisa Gover (joined August 30, 2006)

Roger Helm

Wayne Landis

Rob Ricker

Ralph Stahl

Dale Young

Final January 29, 2007

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Appendices

EXECUTIVE SUMMARY

On December 1, 2005, our seven member subcommittee, with represents from academia, state and federal Trustee agencies, and potentially responsible party groups, was formed under the DOI FACA Committee and assigned to address Question 1:

What are the best available procedures for quantifying natural resource injury on a population, habitat or ecosystem level? What guidance is appropriate for the utilization of these procedures?

Following a full FACA Committee meeting in Denver, Colorado, in July 2006, another member of the full Committee was assigned to provide subcommittee 1 with a tribal trustee perspective on our question. That individual first participated on our subcommittee by joining a conference call on August 30, 2006.

This report was prepared by our eight member subcommittee to provide advice to the DOI FACA Committee regarding the above-referenced question. The subcommittee report was prepared with the intent of presenting all sides of the issues we considered while grappling with the various nuances of the question. We encourage the full Committee to consider all such relevant issues when seeking to reach consensus on the advice and recommendations made by our subcommittee.

Present Process versus Regulations

Information to support the subcommittee deliberations stemmed from subcommittee member experience, interviews with other NRDA practitioners, and a limited survey of settled NRDA cases. We identified three major issues:

We generally observe that there is a lack of strict adherence to the steps in 43 CFR Part 11 apparently because the regulations are deemed insufficiently flexible to allow practitioners to address the wide diversity of contaminants, potential injuries, habitats and resources present at CERCLA sites, or utilize newly emerging assessment

and scaling methodologies. Subcommittee members were not in complete agreement as to which parts of 43 CFR Part 11 are considered inflexible, but one key issue was the regulations mandating that injury studies must be conducted at the population level and this term is not defined within the regulations.

For a number of years now, there has been an increasing desire among the trustee and responsible party (RP) practitioners for 'practicable' (see glossary for definition) or pragmatic approaches to assess natural resource injury and reach mutually satisfactory settlements. Practicable in assessment approaches has been balanced with the trustees' need to insure that the public is adequately compensated for the services lost spatially and temporally, and the responsible party's desire for a timely and cost-effective approach. Our subcommittee views the term 'practicable' in the NRDA context as using approaches and methods that preserve the spirit of 43 CFR Part 11, yet provide flexibility to the parties involved to obtain relevant information in a timely and cost-effective manner. Based on our interviews and personal experience, when 'practicable' was applied to the NRDA process in less complex cases, it allowed injuries to be assessed more quickly and usually resulted in an earlier discussion and implementation of potential restoration options. The ability to focus on key injuries more quickly and to discuss restoration options in parallel with the injury assessment process has been a powerful approach to reaching settlement more rapidly in the smaller, less complex cases.

Several key terms in the NRDA process, such as population, habitat and ecosystem are not defined within 43 CFR Part 11, and other terms, such as community, were not included. This has resulted in confusion and uncertainty over the meaning of these terms in the NRDA process and has unnecessarily inflamed the controversy over what is the appropriate level of biological scale (i.e., at the individual, population, community, or ecosystem level) for assessing injury and determining damages.

Recommendations of Subcommittee 1

1. DOI should provide clarity, either through a revision in 43 CFR Part 11 or through new guidance, that makes clear injury determination and quantification should be performed at the level of habitat and/or at the appropriate level of biological scale (i.e., at the individual, population, community, or ecosystem level) that is practicable, reliable, and reasonable for the site in question. Although the exact level or levels that should be considered will vary on a site-by-site basis, at a minimum, the following factors should be considered in selecting an appropriate level for documenting injuries and quantifying damages: cost, timeliness, uncertainty, and the valued added, or not, to reaching settlement or successful restoration by conducting the assessment at any particular level or levels. For example, injury determination and quantification at lower levels of biological complexity may be accomplished in less time and at lower cost than what would be necessary at more complex levels. However, if determinations at the lower levels result in data that are not scalable to damages or restoration, this may result in difficulty in obtaining agreement as to the magnitude of the injury and the appropriate amount of damages. Conversely, the cost and time involved in determining injury at higher levels of biological complexity may be extreme and the data, which are likely to be confounded by a multitude of factors that typically come into play at higher levels of complexity, also may result in difficulty in obtaining agreement as to the magnitude of injury and the appropriate amount of damages.

2. DOI should consider making revisions or modifications to the 43 CFR Part 11 regulations that are suggestive, but not prescriptive, in terms of mandating the level of biological scale appropriate for injury assessment. We also suggest that modifications or future regulations not be overly prescriptive or mandate particular injury or damage assessment methodologies as these will inevitably change over time with improvements to scientific knowledge and NRDA practice. In our opinion, the present ambiguities in the regulations regarding biological scale(s) for injury determination may be most readily resolved through technical memoranda, updated guidance, or other official written documents.

3. In developing future injury determination and quantification technical guidance documents, DOI should prepare them in a form that is easily updated to account for the evolving nature of scientific methodology. To ensure accuracy and broad acceptance, the guidance should be subject to scientific peer review, and sufficiently flexible to recognize the diversity of contaminants, habitats and resources found at hazardous waste sites in the United States. Regarding the implementation of this recommendation, there may be merit in DOI assembling NRDA practitioners from the public and private sectors, academic experts and other scientists to work collectively on developing such technical guidance.

4. DOI should change their regulations to support habitat restoration or restoration-based options as an early consideration in the damage assessment process. With recent advances in restoration-based scaling methods (e.g., Habitat Equivalency Analysis), injuries can be scaled to the appropriate amount of restoration regardless of the magnitude of the injury. Thus, small injuries can be compensated with small amounts of restoration, and larger injuries will scale to larger restoration efforts. We believe that by considering restoration-based options early in the damage assessment process and by applying scalable damage assessment methodologies the conflict between trustees and responsible parties will be reduced. These actions should provide a better framework for resolving key differences and they will focus the parties on getting to the bottom line more expeditiously.

One member of Subcommittee 1 suggests additional guidance on Recommendation # 4 as further discussed in Section 4, ADDITIONAL PERSPECTIVES ON SUBCOMMITTEE 1 QUESTIONS.

5. DOI should ensure that all pertinent terms such as: individual, population, community, ecosystem, and habitat are defined in the regulations (see attached glossary of terms used in this document).

One member of Subcommittee 1 respectfully disagrees with several of the recommendations made in the Executive Summary by the majority of Subcommittee 1's members, as follows:

First, the Executive Summary indicates that the current Type B Rule set forth at 43 CFR Part 11 does not appear to be "sufficiently flexible" without acknowledging that the Rule is not mandatory and without providing any concrete examples of how it is not flexible. Instead, the Executive Summary seems to conclude that because some trustees have not followed the Rule in conducting some assessments that it must be because the Rule is not sufficiently flexible. The Executive Summary does not appear to consider, whether trustees in some cases do not follow the Rule for other reasons, whether it be for strategic purposes (e.g., litigation strategy) or because the amount of injury and damages in a particular case may not warrant a full-blown Type B NRDA.

Second, the recommendations made by the majority do not seem to recognize that both CERCLA and the questions posed to Subcommittee 1 require a focus on Best Available Procedures (BAPs), not flexibility and practicality.

Third, the Executive Summary also does not recognize that because populations are the fundamental units of biological organization, population level assessments should be the focus of NRDAs when quantifying injury to biological resources. There are reliable and scientifically–defensible procedures for quantifying injury at the population, community or habitat levels. Selection of the best assessment method depends on site-specific characteristics and the target species in the assessment. Although these methods are not referenced in the Type B Rule, they are described in the scientific literature and guidance is available from other statutory programs (e.g., CERCLA ecological risk assessment and various wildlife management programs).

Fourth, the recommendations also do not acknowledge that injury quantification at the individual organism level is not a BAP for formal NRDAs under the Type B Rule

because of substantial uncertainties associated with extrapolation of organism-level effects to population or community-level effects and service losses.

Fifth, injury quantification at the ecosystem level is also not a BAP because of the complexity, lack of available assessment tools and uncertainty in interpretation of biological effects at the ecosystem level.

Finally, it is also important to note that the discussion of restoration-based scaling, including HEA, set forth in the Executive Summary and elsewhere in the Subcommittee #1 report goes beyond the questions posed to Subcommittee 1 about injury quantification and is not pertinent to these questions. HEA is a method for estimating damages, not quantifying injury. Subcommittee 1 has not engaged in a thorough discussion or evaluation of HEA or had any input from outside experts concerning HEA or other project-based damages estimation methods. For these reasons, Subcommittee 1 should defer to Subcommittee 3, which was expressly asked to consider the possible use of HEA to estimate interim compensable value damages.

SECTION 1: Background and Introduction

On December 1, 2005 this subcommittee was formed under the DOI FACA Committee and assigned to address Question 1:

What are the best available procedures for quantifying natural resource injury on a population, habitat or ecosystem level? What guidance is appropriate for the utilization of these procedures?

The subcommittee considered this question through a number of conference calls, email exchange, and face to face meetings over the course of approximately one year. To address the concern that our collective NRDA experience base (see Appendices for Subcommittee experience) may not be wholly representative of current NRDA practice, we undertook a number of phone interviews with, and posed questions to, individuals recognized for their NRDA experience (see Appendices for interview notes). We also conducted an informal, limited review of settled cases to determine if there were key points that were relevant to our assignment.

Early in our deliberations, we determined that the phrasing of this question was problematic. Since the question stemmed directly from the existing 43 CFR 11 regulations, the problem with the question and the existing regulations might be related to the training and experience among those individuals who drafted the regulations initially. For example, from a biological and ecological perspective, there is a lack of congruity among the terms population, habitat, and ecosystem. Typically, the complexity of biological scale increases from individual – population – community – ecosystem, and in this case, habitat is not a level of biological scale per se.

It is presumed in the question posed to us that some or all of 43 CFR 11 has been a problem for NRDA practitioners. Our initial review of 43 CFR 11 indicates that the regulations are confusing with respect to the terms population, habitat, and ecosystem, as

they are undefined and thus open to diverse interpretation. This may be one of the underlying stimuli for the question posed to the subcommittee. As a backdrop, moreover, confusion in the regulations, ambiguities, uncertainties, etc. may be one of the reasons why there is not strict adherence to 43 CFR 11 by practitioners, and why approaches at one site may be vastly different (perceived or otherwise) than for another site. One might also envision that there could be an additional constraint when some practitioners believe that under the existing language of 43 CFR 11 assessments can only be conducted at the population, ecosystem or habitat scales. Those individuals might then proceed with assessments at these scales under the assumption that they are mandated by the existing regulations. However, as noted above, the experience base among the Subcommittee's members suggests that a large number of assessments have been, and continue to be conducted at the individual and habitat levels. Further, we found no evidence thus far to indicate that there have been any assessments conducted at the ecosystem level.

The report that follows is structured into two major sections. Section 2, Analysis, reviews our assessment of the existing regulations and the problems (perceived or real) that result from their application (or lack thereof). Within this section, we also include specific responses to the question regarding methods that can be applied at various biological scales, and the strengths and weaknesses of those methods. We did not, however, attempt an exhaustive review of methods as this would be far beyond the scope of our assignment. Section 3, Conclusions and Recommendations, provides specific points for the full FACA to consider regarding Question 1. Following these two sections is a section that provides for "additional perspectives", and a number of appendices that provide additional details on the Subcommittee's deliberations. The appendices provide an overview of what in the existing regulations may be leading to their lack of application in most NRD cases, and what methods may be suitable for certain applications.

SECTION 2: ANALYSIS

2.1 Role of existing regulations – 43 CFR 11

As noted in Section 1, we found incongruities in the regulations regarding the biological scales at which injury determination and quantification should be conducted. The regulations appear to identify populations, habitats, and ecosystems [DOI 43 CFR 11.71 (l)] as the levels where injury quantification should occur, but the regulations do not provide working definitions of these terms. Under 43 CFR 11 accurate quantification of injury rests on developing "numerical data that will allow comparison between the assessment area data and the control area or baseline data (DOI 43 CFR 11.71(l)(I), and, depending on the resource being evaluated, that quantification can occur at various levels of biological organization, or can be based on habitat characteristics." Yet there are no definitions or examples given in the regulations that would help practitioners interpret the meaning of population, habitat or ecosystem or how one would go about conducting injury determination at these scales.

Although detailed publications on undertaking evaluations at these biological scales exist, an exhaustive review of them is beyond the scope of the Subcommittee's assignment. We do provide some general guidance on these methods later in this section, and some additional details in the Appendices.

Language in the existing regulations indicates that injury quantification should focus on evaluating impacts at the population (or community level although it is not noted specifically in the existing regulations), habitat or ecosystem levels, especially since extrapolation of individual species effects to higher levels of biological scale are highly uncertain and spatial and temporal factors must be carefully considered. Nevertheless, what appears to have predominated in practice, based on the experience of some subcommittee members, and from interviews with current practitioners, is that injury assessment at the population level or higher seems to be rare for NRDAs that do not involve litigation.

Relationship of Question 1 to the Regulations

For injury quantification, the regulations are explicit in stating: "The extent to which the injured biological resource differs from baseline should be determined by analysis of the population or the habitat or ecosystem levels" [43 CFR § 11.71 (l) (1)]. The regulations view injury quantification, as described above, as a distinct and separate step from injury determination. A wide variety of biological responses can be used to determine injury, including measurements at the organism or sub-organism levels, insofar as they meet four acceptance criteria identified in the regulations. Injury determination is effectively a screening step that identifies potentially injured resources. The analysis of populations, habitats, or ecosystems is then conducted for resources where injury has been determined. This is an important distinction because the objective of an NRDA is not just to determine that an injury has occurred, but it is necessary to quantify the magnitude and extent of that injury so that service loss, and thus damages or restoration, can also be quantified.

In 43 CFR § 11.71, the regulations specify that measurement methods at the population, habitat, or ecosystem levels must be selected to provide data in terms of services. Services are defined in the regulations as functions performed by the resource and are the result of the biological qualities of the resource. Examples of biological services include provisions for food, habitat, or other needs of the resource. Under certain circumstances, the regulations also indicate that services can be quantified directly rather than quantifying changes in the relevant resource at the population or other level. In such cases, it must be shown that any change in services resulted from the resource injury and that the measurement of services provides a better indication of damages than direct quantification of the injury itself.

The regulations provide general guidance on methods that are appropriate for injury quantification at the population and habitat levels. For example, for estimating population differences, the regulations specify that "...standard and widely-accepted

techniques, such as census, mark-recapture, density, and index methods..." shall be used (43 CFR § 11.71 (l) (5). For quantifying wildlife populations, standard and widely-accepted techniques such as those identified in the Wildlife Management Techniques Manual (1980)[1] and references cited therein are recommended. Although the regulations state that a specific method used in an NRDA need not necessarily be cited in the manual, any methods used should conform to the recommendations for data quality contained therein. It is also stated that measurements of age structure and life table statistics will generally not provide acceptable data for injury quantification unless it can be demonstrated that the release has differentially affected age classes and appropriate baseline age structure data are available.

For plant populations, the regulations simply state that standard techniques may be used such as estimates of density, species composition, diversity, and cover. For habitat quality, techniques such as Habitat Evaluation Procedures (U.S. FWS, 1980) may be used.

In summary, the regulations are specific concerning the need for population-level or higher assessments as part of the injury quantification step in an NRDA. However, the regulations are not prescriptive concerning specific methods that must be used. It is acknowledged, however, that there are standard and widely-accepted methods available for many kinds of biological resources and that such methods can be used for injury quantification as long as they produce meaningful comparisons between resource services at assessment and baseline areas.

As a result of the above, one of the subcommittee's deliberations has been to explore possible reasons for the discrepancy (between the regulations and actual practice) and, where feasible, identify when assessments at each of the levels prescribed by the regulations may or may not be appropriate. Our current evaluation is that the desire to

[1] Currently available as: Techniques for Wildlife Investigation and Management (6th ed.) 2005. The Wildlife Society, Bethesda, MD.

358 expedite the assessment process is often driven by goals shared among practitioners of 1.
359 avoiding litigation, and 2. Ensuring that more effort and expense go toward the
360 settlement goals rather than on the assessment process. We have attempted to capture
361 some of the reasons for the current practice in the Appendices. In many cases,
362 restoration-based, cooperative settlements have been reached in which there is an
363 expedited assessment of injury that does not comply with the DOI regulations.
364
365 However, in some situations, strict adherence to the regulations may have been
366 favored (e.g., in very complex sites involving very large alleged damages) because from
367 a legal perspective it provided a more rigorous correlation between releases, injuries, and
368 resultant damages. Ideally, there should be room in the overall injury determination and
369 quantification process to accommodate both situations – one when there is general
370 agreement and cooperation among Trustee and RP groups, and another when there are
371 substantive differences in perspectives as to the alleged injuries, service losses, and
372 subsequent damages.
373
374 Clarification of the regulations and/or substantially updated guidance
375 documentation may be appropriate to preserve trustee and RP flexibility, rather than
376 undertaking wholesale replacement of important concepts and safeguards in the existing
377 43 CFR 11 regulations. Based on our experience base, the rebuttable presumption that is
378 afforded to Trustees under the current regulations is rarely pursued; however, it does not
379 mean that this judicial review standard should be eliminated. Portions of the existing
380 regulations are likely to be useful in protecting both the Trustees and the RPs, and neither
381 group should have to forego any technical or legal defenses that may be useful under
382 existing laws and regulations.
383
384 Under existing 43 CFR 11 language, there is a provision for the use of Best
385 Available Procedures (BAPs), which may offer another explanation for some of the
386 diversity that is found in the NRDA practice, and why there does not appear to be a
387 universal adherence to the regulations. BAPs, will, as a matter of course, evolve as the

388 scientific underpinnings of these procedures improve with increased knowledge. Thus,
389 over time, new procedures may be applied at some sites and not at others, depending in
390 part on the training and experience of the trustees and RPs involved. Similarly, one
391 could also envision that BAPs for physical, chemical, biological, or toxicological
392 investigations may apply at some sites and not at others, owing to differences in the types
393 of habitats and receptors that might be present at one site and not at another. As much as
394 any other possibility that could exist, variability among injury assessments at CERCLA
395 sites may result from the use of BAPs where practitioner preference or regional needs
396 (specific types of ecological receptors, habitats, etc.) underlay the approaches.
397
398 While we did not attempt to survey practitioners directly regarding what in 43
399 CFR 11 is deemed "inflexible" we observe that time, resources, the need to reduce
400 uncertainty and costs may be the primary issues at work. In other words, while there may
401 not be an explicit issue with the lack of flexibility in the existing regulations, Trustees
402 and RPs may, over time, have focused on "practicable", e.g. getting the NRDA
403 conducted at a biological scale that is most amenable to a timely and cost-effective
404 determination of injury. Practicable, in our opinion, subsumes the issues of time,
405 resources, costs and uncertainty. This observation comports with some of the
406 subcommittee members' experience base, with some of the interviews we conducted with
407 leading NRDA practitioners, and with the limited number of settled cases that we
408 reviewed.
409
410 We are cognizant of the ambiguity in applying the term "practicable" to NRDA in
411 that the term can be open to highly diverse, and potentially divergent interpretation. In
412 this context we view "practicable" as using approaches / methods – the recent experience
413 base among practitioners in the governmental, industrial and consulting communities –
414 that preserves the spirit of 43 CFR 11 yet provide information in a timely and cost-
415 effective manner. We observe that applying "practicable", as we have defined it, to the
416 NRDA process seems to have allowed trustees and RPs, in some cases, to more quickly
417 move through the injury determination and quantification, and reach timely, cost-

418 effective settlements. We also recognize that the utilization of 43 CFR 11 regulations in
419 an NRDA is not mandatory per se, but we cannot confirm that this is the main reason for
420 the lack of adherence to the existing regulations.
421
422 **2.2 Methodologies**
423 Despite the need to fully address the question posed to us, it was beyond our
424 scope to provide an exhaustive review of methods that might be used to conduct injury
425 determination and quantification at the population, ecosystem or habitat scales, nor to do
426 so for individual or community scales. We do provide some general commentary on
427 methods at each of these scales, along with their strengths and weaknesses as applied to
428 injury determination and quantification. As we indicated previously in this report, there
429 are numerous published materials that address each of these biological scales and how
430 the methods involved may or may not be applicable to certain situations. We caution that
431 few, if any, of the published materials cited or reviewed in this report respond directly to
432 the question of whether or not the methods are applicable for natural resource injury
433 determination or quantification. It should be self-evident that the decision as to their
434 applicability to NRDA is up to decision and policy makers in the relevant federal agency.
435 What we have endeavored to provide is the scientific underpinning to inform that
436 decision, as the selection of any one method or biological scale should have a strong
437 scientific basis.
438
439 Although guidance is lacking in the NRDA area, there are a number of tools for
440 higher-level assessments even though their application outside of a resource management
441 paradigm (setting of hunting or fishing limits) appears to be limited.
442
443 It is important to recognize that there will be a balance between the need for
444 expedited injury determination and quantification at some sites, compared to the need for
445 more involved, higher-scale assessments at other sites. Responses at lower levels of
446 biological organization are generally more specific and are better understood in terms of
447 mechanisms. Consequently, cause and effect relationships are more obvious with sub-

individual responses. Responses at higher levels of biological organization occur at broader spatiotemporal scales and have greater ecological relevance (Clements and Newman 2002). This point is illustrated in Figure 2-1.

Table 2-1 presents a discussion of various issues regarding methods of assessing injury in a simple matrix format. We include discussion of when and where these tools could be applied – and when and where they should not be applied – in response to the second part of Question 1. It is important to note that these tools are discussed in the context of their strengths and weaknesses so that any revisions to 43 CFR 11, or for the development of new guidelines, to include the full suite of tools that could be applied – should they be necessary. Our purpose is not to indicate a preference for one tool over another, nor to exhaustively review all potential methods and tools, but to provide the general information necessary for practitioners to understand which tools may be more useful in a particular situation compared to another tool.

2.2.1 Individual-level assessments

The individual, by definition, is a single organism. It is the fundamental unit of various higher levels of biological organization. For example, a group of genetically similar and interbreeding individuals constitute a species, and individuals of a particular species within a defined geographic range can be described as a population. Collections of genetically similar or diverse individuals in a particular location or environment, representing one or more populations, can constitute a biological community.

In terms of biological value, the individual is a discrete unit that provides a species with genetic and reproductive diversity, which is essential for identity and persistence of the species. A key contribution of individuals to populations and ecosystems is to provide a reservoir of genetic diversity. This diversity is critical for maintaining stability of populations and providing resilience to "natural" and anthropogenic perturbations. Variation in life histories and the ages of individuals lead to age class diversity of species within a community, which is important for the long term

survival and reproduction of many species. Age class diversity also is important to the productivity and stability of biological communities. Removal of select individuals of a specific age class can have significant impacts at the species or community levels. For example, a twenty year old willow tree differs from a one year old willow in a riparian corridor through its increased ability to withstand flood conditions, greater production of reproductive propagules, more foliage and resulting nesting habitat, and other properties affecting water and sediment dynamics in the riparian zone. Loss of the older willow may mean loss of critical nesting habitat since some birds nest only in trees matured to a certain age that produce or exceed a minimal foliage volume.

In special status species (such as locally rare, threatened, or endangered species), the biological value of the individual is considerably increased due to the relative contribution of the individual to the genetic diversity, reproductive capacity, age composition, or long term survivability of the species. In these instances, loss of a few individuals has an increased probability (vs. non T&E species) of resulting changes to species stability, community composition, and higher level energetics within ecosystems.

In societal terms, the individual can assume extreme importance not just for special status species but also for other species that may be deemed "charismatic macrofauna" – animals with fur or feathers, or plants such as redwoods. These are highly valued by humans for a variety of reasons such as wildlife viewing or simply through knowledge of their existence. Similarly, certain types of habitats have intrinsic values to humans based on societal as well as biological uses. Biological losses and gains are generally counted at the level of the individual, and similarly habitat losses and gains are often counted using a comparable single unit metric such as acre or hectare.

Additional examples of the importance of the individual can be found in the wildlife management practices for hunting and fishing, which control the takes of individuals to ensure continuation of populations of adequate size and composition so that a sufficient number of individuals are produced to preserve the wildlife resource. In

many areas of the U.S., these resources are economically critical for both commercial take and recreation. Areas of specific watersheds, rangelands and coastal habitats are managed to ensure the productivity of valued populations so that individuals are available at specific locations with a great deal of predictability.

So what is the value of the individual in terms of damage assessments, and has compensable loss occurred if individuals are injured or lost to the population? Or, as some may assert, is there no loss if "no detectable change to the population" can be shown? To answer these questions, we need to address the nature and intent of the damage assessment process with an eye to the role of the individual organism. Additionally, we need to understand how changes to a population can be defined, and whether or not the changes can be quantitatively measured, related to the pollution incident, and compensated -- these are basic premises in the damage assessment process.

The NRDA process is intended to compensate the public for all losses to its resources and for lost uses of those resources. It is a legal process that encompasses both biological and societal (including economic) values for the resources. It is also a process that uses science and economics to measure and quantify the losses. The individual, as defined above, has both biological and societal value that can be characterized and quantified. Reduction in the number of individuals, or changes to the functionality of those individuals (i.e., sublethal effects), caused by a pollution incident are natural resource injuries. Loss of individuals represents the minimum level of injury for compensation, and additional compensation may be warranted if the loss of individuals leads to additional losses at higher biological levels such as at the population, community, and ecosystems levels. In some instances, loss of individuals may result in species shifts that alter community compositions and affect the overall quality of a habitat (e.g., decreases in native plant species leading to changes in biodiversity and resulting changes in saltmarsh structure and function; Zedler and Kercher, 2004). In such cases, compensation should address the loss of individuals, their offspring, and the associated changes at the level of the population, community, habitat, and ecosystem.

538 In practice, very few injury determinations in NRDA cases are focused at the
539 population and ecosystem levels because of a variety of factors including high study
540 costs to achieve adequate certainty for delineating populations in open systems,
541 demonstrating causal relationships, and quantitatively addressing uncertainties associated
542 with interpretations of impacts to higher levels of biological order. Most NRDA claims
543 are based on direct measurements or modeled counts of individuals injured (e.g., number
544 of birds killed or debilitated, counts in fish kills, number of sea otters impaired or killed,
545 etc.), quantities of biomass or productivity lost, and specific numbers of acres of specific
546 habitat types impacted. Losses of human use of the resources also are determined at the
547 individual level (e.g., lost beach user days, diminished quality of individual fishing trips,
548 lost access to wildlife viewing, etc. and more exacting losses including, for instance,
549 Indian treaty rights and cultural uses of resources). Similarly on the credit side of the
550 equation, compensation is scaled through restoration projects that are proposed to return
551 similar numbers of individual "items".
552
553 Experienced practitioners of NRDA know that proving injuries at the population
554 or ecosystem level can be a very expensive and demanding proposition, especially if one
555 is trying to circumscribe a population, delineate immigration and emigration rates, confer
556 a level of biological significance at the population level caused by the loss of individuals,
557 and tease out potential confounding factors that might also effect changes at the
558 population level. Fortunately, this is not a requirement of the damage assessment process
559 for asserting a claim of loss, which can be measured and scaled in terms of individuals
560 lost. If the loss needs to be presented in terms of the population, then the population can
561 be defined as the relevant group of individuals at the pollution-affected site, and the loss
562 simplistically presented as the total population (N) minus the number of individuals lost
563 or harmed (i) plus the offspring (o) that the individuals would have produced [population
564 loss = N-(i + o)].
565
566 If the individual is the fundamental unit of value, then why consider population,
567 community, habitat or other scales? The answer is that it puts the individual in its

ecological context. Without a clear understanding of context, the extent of injury may be underestimated. The same numbers of individuals lost from a small, regional population may constitute a greater loss of a valued resource both at the time of the event and into the future, compared to a large, interconnected population of even the same species. In some species females are more valued because of their greater contribution of individuals as a resource in the next generation.

Claims of loss can be asserted for individuals harmed, and compensation scaled and pursued at the level of the individual, but this is likely to represent the lower bound for an injury claim. Additional losses at higher biological levels may not be adequately compensated by simply basing claims on losses of individuals. The decision to pursue claims for higher level losses generally reflects a number of factors, but the natural resource trustees are responsible for making this decision based on what is in the best interests of the resources and the public.

Various federal, state, and local laws define how we work in the NRDA process. The standard practice of trustee teams is to work through consensus to assert and settle claims that comply with all relevant laws. Many states have laws, guidance, and/or policies that explicitly state the need to compensate for any and all losses of natural resources, and agency guidance in some states specifies "no net loss", whether measured in acres of wetland or numbers of individuals of a species. Regardless of how explicit or vague a federal law may be about the level of loss that should be compensated, trustee teams strive to comply with all participants' legal requirements and practices – which has led to compensation at the level of individual.

2.2.2 Population-level assessments

Because populations are generally considered the fundamental units of ecological systems, it is appropriate that ecological risk assessments and, in some cases, natural resource damage assessments focus on this level of biological organization. Ecological assessment of the effects of stressors on populations includes quantitative measures of

demographic characteristics such as density, age structure, reproductive rate, and recruitment (Newman 2001). Quantifying spatial or temporal changes in these demographic characteristics for natural populations generally requires the application of mark and recapture techniques integrated with population models. Some of the best examples of population level assessments of contaminant effects are from studies of birds, small mammals, and marine fish (Carlsen et al. 2004).

In population level assessments, the general assumption is that a causal relationship exists between stressors and demographic characteristics such that lower instantaneous rates of population increase (*r*, defined as the difference between birth rates and mortality rates) affect recruitment of new individuals in the population, thereby causing local extinction (Maurer et al. 1996). Two of the most significant challenges in population level assessments are establishing linkages between individual and population level responses to stressors and determining how much reduction in *r* a population can sustain and still persist in the environment. Raimondo and McKinney (2006) used demographic population models to establish a quantitative relationship between individual and population level responses for a series of toxicants. Spromberg and Meador (2005) have modeled the impacts of certain types of toxicants upon specific salmonid populations. These modes of actions produce identifiable patterns in the age distribution of the fish population. The application of population level assessments in NRDA will require a better understanding of these relationships.

Uncertainty exists in the measurements and the models that assess population level effects. Measurement of population parameters that allow calculation of r or of the similar parameter λ for age-structured populations requires information on survivorship, fertility and mortality. Fortunately in many cases these data exists for commercially or socially important populations. A second major source of uncertainty is in the definition of the population being assessed and its spatial structure. Does the impacted site cover a significant portion of a critical population or only a small portion of the population? In the case of salmonids along the Pacific coast the unit of assessment is the evolutionary

628 significant unit (NOAA 2005). How does the spatial structure affect the propagation of
629 contaminant effects throughout a subpopulations of patchy or metapopulation
630 (Spromberg et al 1998)? In many instances the spatial relationships may not be
631 adequately understood.
632
633 These and other uncertainties can be addressed by adequate sampling and a
634 tagging program or through genetic analysis that defines the boundaries of the
635 population. The use of biomarkers for exposure and effects can also lead to building a
636 weight of evidence to establish a causal relationship between the stressor and the
637 population level effect.
638
639 **2.2.3 Community-level assessments**
640 Within the context of the hierarchical arrangement of living systems, communities
641 are intermediate between populations and ecosystems. Although a community may be
642 defined as interacting populations that overlap in time and space, the study of
643 communities is much broader than a simple description of individual populations. Instead
644 of characterizing birth rates, death rates, and other demographic features of isolated
645 populations, the focus of community level assessments is on structural characteristics
646 such as community composition, species diversity, and abundance of sensitive and
647 tolerant species. Although most general ecology textbooks devote significant coverage to
648 the topic of communities, the focus in most ecotoxicological investigations remains on
649 individuals and populations. There is still the perception that communities are primarily
650 human abstractions about groups of populations that lack defined spatial and temporal
651 boundaries. Moriarty (1988) questioned the need to study effects of contaminants on
652 communities and concluded that for ecotoxicology, the population is the most appropriate
653 level of organization.
654
655 Because numerous factors in addition to contaminants affect community
656 composition, demonstrating a causal relationship between anthropogenic stressors and
657 community levels responses remains a serious challenge. The best examples of

658 community level assessments in the ecotoxicological literature are generally from aquatic
659 ecosystems, especially fish and benthic macroinvertebrates. Sophisticated multivariate
660 statistical techniques (Clarke 1999; Sparks et al. 1999) and multimetric approaches (Karr
661 1981) have been employed to quantify effects of a variety of stressors on communities.
662 Multimetric and multivariate approaches are particularly useful for community-level
663 studies because they reduce the typically complex, multidimensional data to readily
664 interpretable patterns. Indeed, our understanding of how fish and macroinvertebrates
665 respond to various anthropogenic disturbances has advanced to the stage where
666 researchers can now identify indicator communities that are indicative of specific types
667 of disturbances. The development of these approaches for other groups of organisms
668 (e.g., small mammals and birds) remains a significant challenge in NRDA.
669
670 Uncertainty exists in the measurement of community level impacts. There are a
671 number of metrics that can be used, and each takes a different point of view on the best
672 measure of the patterns in ecological communities. There is still no one best
673 measurement technique for addressing questions about impacts or persistent changes. In
674 some instances it may be that habitat for a specific critical species may be used as a
675 surrogate when accurate measurements of population size are not possible. In this
676 instance it is important to understand the habitat characteristics that are important, both
677 the biotic and abiotic components.
678
679 There is also uncertainty in the lag times between the onset of a stressor and the
680 appearance of a measurable response in the community metrics. Indirect effects may
681 appear only after enough time has lapsed so that the community metrics being observed
682 can respond. Effects may persist after the cessation of the stressor event as well.
683 Phenomena such as Pollution Induced Community Tolerance (PICT) (Blank and
684 Wangberg 1988) and Community Conditioning (Matthews et al 1996) demonstrate that
685 effects can persist within the community even after the removal of the stressor.
686 Uncertainty lies in the ability to differentiate effects from the stressor under consideration
687 in the NRDA from other stressors to which the community is subjected.

These uncertainties can be addressed by ensuring that the sampling program includes a broad enough spatial extent such that effects of other stressors within the environment can be analyzed and separated from those of interest in the NRDA. Such an approach requires that a variety of environmental gradients be incorporated into the sample design. However, it is important to recognize that simple upstream-downstream, or reference-impact designs can be uninformative.

2.2.4 Ecosystem-level assessments

Likens (1992) defined an ecosystem as a "spatially explicit unit of the earth that includes all of the organisms along with all components of the abiotic environment within its boundaries." In contrast to the emphasis on structural characteristics, at the ecosystem level we are generally more concerned with effects of contaminants on processes, such as rates of energy flow, nutrient cycling, or primary production.

In general, effects of contaminants and other anthropogenic stressors on ecosystem processes have not received significant attention in the ecotoxicological literature and are rarely considered within a regulatory framework. In light of the complexity of ecosystems and the uncertainly in defining their spatiotemporal boundaries, the focus on populations and communities in most ecotoxicological research is understandable. One of the challenges associated with assessing injury to ecosystems will be to determine which particular processes are important. The most likely candidates (e.g., rates of primary production, energy flow, nutrient cycling, and decomposition) are notoriously variable (Schindler 1987), and, depending on the particular stressor, may either increase or decrease in response to disturbance. Furthermore, because of high variability and functional redundancy of many ecosystem processes, alterations in abundance of sensitive populations or changes in the structure of communities may occur long before we see shifts in processes.

From a practicable perspective, the fundamental question related to ecosystem level assessment is whether alterations in the rate of energy flow and material exchange

718 can serve as sensitive indicators of anthropogenic perturbation. Rapport et al. (1985) have
719 published one of the few attempts to compare ecosystem responses to a variety of
720 stressors across different ecosystem types. One of the most striking features of this
721 exercise was that, in contrast to population and community level responses, relatively few
722 ecosystem processes consistently responded in a predicable way to anthropogenic
723 disturbance.
724
725 There is uncertainty in several aspects of ecosystem level assessments in
726 environmental toxicology. Defining the boundaries of an ecosystem has often been
727 problematic and perhaps arbitrary. What should be the extent of the Clarke Fork River
728 ecosystem or the Puget Sound ecosystem? Does the spatial boundary of these
729 ecosystems also include the surrounding watersheds? In the case of Puget Sound where
730 is the boundary between Puget Sound and the Georgia Straits ecosystem? The spatial
731 extent of most ecosystems also makes adequate sampling at a sufficient time scale a
732 challenge, which contributes to uncertainty. In order to conduct such a sampling
733 program the questions must be specific and the timeframe adequately defined.
734
735 **2.2.5 Habitat assessments**
736 Habitat, defined as the natural abode, locality or region of an animal or plant,
737 has been the subject of increasing interest as a tool for risk assessment, environmental
738 management and decision making (Kapustka 2005). Habitat is not a level of organization
739 in the classic hierarchical representation. Habitat is best thought of as those specific
740 requirements that exist within a region that are necessary to support the organism and the
741 continuation of the population at the levels required to provide the required ecosystem
742 services or by regulation. These requirements can vary seasonally, both in location and
743 in condition. Species with migratory patterns must have the specific habitat at the
744 reproductive site, the migratory pathways, and the overwintering or other destination.
745 Such considerations require examining the landscape requirements of the species over its
746 entire range. Different life stages of a species often inhabit very different environments.
747 For many invertebrates the larval life stage is pelagic, even if the adult is sessile. For

example, Dungeness crab within the Georgia Straits use different parts of the marine environment depending upon the age of the individual.

The amount of habitat is also important. Habitat should be in sufficient quantity and quality so that a viable population can be produced that meets the socially defined needs. For species that are hunted, fished or harvested sufficient production should be available so that these takes are not large enough to depress the population below the required level.

2.2.5.1 Measurement of Habitat

There are a number of methods that have been developed to describe the relationships between the characteristics of an area and species distribution. These have been reviewed by Kapustka (2005) in regards to the suitability of the method towards ecological risk assessments. The requirements can be expressed qualitatively, semi quantitative and also in a quantitative fashion. The semi-quantitative habitat suitability index (HSI) has been derived for a number of species under the auspices of the U. S. Fish and Wildlife service. Currently 160 HSIs have been published, although only a few provide a quantitative estimate of species density. Maps of habitat within the region of interest can be generated using survey data and remote sensing combined in a GIS format

Remote sensing and ground techniques have been used as part of the US Geological Service (USGS) GAP program (see http://gapanalysis.nbii.gov/). Patterns of vegetation are plotted, land cover determined, and a variety of other data assembled during the process. Areas that provide suitable habitat for the species of interest can then be identified. Changes in habitat, either an increase or decrease, can be estimated by using either a GAP or HIS approach. Such a determination can be used as a surrogate for the increase or decrease of important populations or other assessment goals in the region. Such analyses can also provide guidance for restoration activities.

2.2.5.2 Uncertainties

There are several uncertainties associated with the application of habitat as a measurement. The most important uncertainty is defining of the appropriate habitat for the species of interest. Although over 160 HSIs are available, that still leaves a number of species undefined. Part of the assessment process may have to be the derivation of an appropriate index. Second is the mapping of the current habitat and documenting the change in habitat due to the damage. This is typically done by a combination of remote sensing and ground observations. Prior habitat distributions can be determined by past mapping efforts or routine surveys. Third is that is not always clear how the amount of habitat relates to the total population. Habitat is a necessary requirement for a species to exist in an area, but the spatial arrangement of habitat, the relationship to its prey species (Jager et al 2006), and the occurrence of other stressors (Munns jr. 2006) may also alter the number of individuals that can recolonize a restored area.

2.3 Use of Ecological Risk Assessment Methods / Approaches

With respect to other frameworks and approaches that might be useful in the context of NRDAs, one suggestion is to explore the tenets of ecological risk assessment (ERA) for application to NRDAs. In many respects, much of the data collected for the ERA is the same as that which will be used for the NRDA, however, it is recognized that the products of these differ (Barnthouse and Stahl 2002). The product of the ERA is an estimate of risk, coupled with a discussion of the uncertainties in the assessment and the data. The product of the NRDA is an estimate of injury and service loss which are translated into a claim that can be resolved through restoration or other means.

The approach to ERA has been subjected to significant peer review, national debate, and practice revisions over the past 10 years. Taking these lessons learned, and the improvements to the science, suggests that an ERA-like approach may be one way to improve NRDAs, provided some of the issues on dealing with uncertainty can be managed. Ways to address uncertainty in the ERA context are to acquire additional data, be conservative in the risk management decision, or to monitor the results of the decision

806 in an adaptive management approach (using monitoring data to trigger additional actions,
807 if needed).
808
809 Similarly, this concept may be applied to the NRDA, where uncertainty can be
810 addressed by determining the resource losses as a range rather than a single value.
811 Following this approach, selecting and implementing a restoration project that would
812 compensate for losses at the high end of the injury range could satisfy concerns about
813 scaling and adequate compensation, thereby removing one obstacle that is often a major
814 impediment to settling NRD claims. Addressing uncertainty in this fashion will likely be
815 case by case and require substantial discourse between the Trustees, the responsible
816 party, and the public before implementation.
817
818 **2.4 Summary**
819 Assessments of the effects of contaminants and other stressors have been
820 conducted at all levels of biological organization. The tools and methodological
821 approaches designed to assess ecological responses at higher levels of organization are
822 well described in the literature. However, ecological assessments beyond the level of
823 individuals in NRDAs have been quite limited, in part because of the inherent uncertainty
824 associated with results at these higher levels of organization.
825
826 In general, our understanding of underlying mechanisms and our ability to
827 determine causal relationships between stressors and responses diminishes at higher
828 levels of biological organization (Clements and Newman 2002; Forbes et al. 2006). For
829 example, many of the criteria used to demonstrate causation at the population level (e.g.,
830 strength and consistency of association, dose-response relationships, specificity, and
831 experimental evidence) will be difficult to employ at the ecosystem level. Nonetheless,
832 stressor effects beyond the level of individuals, particularly on populations and
833 communities, are likely to occur and should be considered when quantifying injuries
834 within the context of NRDA.

SECTION 3: CONCLUSIONS AND RECOMMENDATIONS

Over the course of the past 12 months members of the Subcommittee have engaged in numerous conference calls, interviews with leading practitioners, and face to face meetings. Through this interchange, and by applying personal NRDA experiences, we have attempted to provide a cogent response to the question posed to us. It is clear that there are numerous other questions that are subsumed questions posed to us, and we have endeavored to not become side-tracked in answering them, and thereby fail to complete our assigned task. Our goal was to not only be responsive to the questions presented, but also represent the diversity of views that are held on the questions.

Generally speaking we have observed there has been and continues to be a lack of strict adherence to the steps in 43 CFR 11 primarily because, apparently the current regulations do not appear to be sufficiently flexible to allow practitioners to address the wide diversity of contaminants, habitats and resources present at CERCLA sites. At this time it is not totally clear to us which parts of 43 CFR 11 are considered inflexible by the practitioner community, but some suspected underlying reasons for this observation have been discussed. Other reasons are likely to exist that we have not discussed in this report. We are also cognizant that the use of 43 CFR 11 regulations is not mandatory but cannot conclude that this is the main reason why there is not strict adherence to the regulations.

We have also noted that over the past 5 years, there has been an increasing desire for practicable approaches among the trustee and RP communities as it relates to natural resource injury assessment, and settlement. This practicable approach has been balanced with the trustee's need to insure that the public is compensated for the services lost spatially and temporally, and the responsible party's desire for a timely and cost-effective process.. In this context, and applying Subcommittee members' experience, we view "practicable" as using approaches / methods – the recent experience base among practitioners in the governmental, industrial and consultant communities - that preserve

the spirit of 43 CFR 11 yet provide relevant, reliable information in a timely and cost-effective manner. Thus applying "practicable" to the NRDA process has allowed trustees and RPs to more quickly assess injuries in the less complex NRD cases, while at the same time, discussing potential restoration options at an early stage. The ability to assess injuries quickly and discuss restoration options in parallel appears to have been a powerful mechanism for quickly settling the smaller, less complex cases. We also remind ourselves and readers of this report that "practicable" is not an absolute term, and certainly is open to diverse and divergent interpretation as it relates to injury determination and quantification. Nevertheless, we think it is an underlying theme reflected in the current NRDA practice, and one that should be incorporated into any revisions to 43 CFR 11, or in the development of new guidance for injury determination and quantification.

A specific, tractable problem exists in 43 CFR 11 where the terms population, habitat and ecosystems are not defined. This has left NRDA practitioners, past and present, with uncertainties regarding their meaning, and, more importantly, with little or no guidance on what level of biological scale may be preferable for determining natural resource injury at specific sites. By providing definitions for these terms, and illustrating their application to injury determination and quantification, much of the real or perceived problem with 43 CFR 11 might be addressed.

3.1 Recommendations of Subcommittee 1

1. DOI should provide clarity, either through a revision in 43 CFR Part 11 or through new guidance, that makes clear injury determination and quantification should be performed at the level of habitat and/or at the appropriate level of biological scale (i.e., at the individual, population, community, or ecosystem level) that is practicable, reliable, and reasonable for the site in question. Although the exact level or levels that should be considered will vary on a site-by-site basis, at a minimum, the following factors should be considered in selecting an appropriate level for documenting injuries and quantifying damages: cost, timeliness, uncertainty, and the valued added, or not, to reaching

settlement or successful restoration by conducting the assessment at any particular level or levels. For example, injury determination and quantification at lower levels of biological complexity may be accomplished in less time and at lower cost than what would be necessary at more complex levels. However, if determinations at the lower levels result in data that are not scalable to damages or restoration, this may result in difficulty in obtaining agreement as to the magnitude of the injury and the appropriate amount of damages. Conversely, the cost and time involved in determining injury at higher levels of biological complexity may be extreme and the data, which are likely to be confounded by a multitude of factors that typically come into play at higher levels of complexity, also may result in difficulty in obtaining agreement as to the magnitude of injury and the appropriate amount damages.

2. DOI should consider making revisions or modifications to the 43 CFR Part 11 regulations that are suggestive, but not prescriptive, in terms of mandating the level of biological scale appropriate for injury assessment. We also suggest that modifications or future regulations not be overly prescriptive or mandate particular injury or damage assessment methodologies as these will inevitably change over time with improvements to scientific knowledge and NRDA practice. In our opinion, the present ambiguities in the regulations regarding biological scale(s) for injury determination may be most readily resolved through technical memoranda, updated guidance, or other official written documents.

3. In developing future injury determination and quantification technical guidance documents, DOI should prepare them in a form that is easily updated to account for the evolving nature of scientific methodology. To ensure accuracy and broad acceptance, the guidance should be subject to scientific peer review, and sufficiently flexible to recognize the diversity of contaminants, habitats and resources found at hazardous waste sites in the United States. Regarding the implementation of this recommendation, there may be merit in DOI assembling NRDA practitioners from the public and private sectors,

academic experts and other scientists to work collectively on developing such technical guidance.

4. DOI should change their regulations to support habitat restoration or restoration-based options as an early consideration in the damage assessment process. With recent advances in restoration-based scaling methods (e.g., Habitat Equivalency Analysis), injuries can be scaled to the appropriate amount of restoration regardless of the magnitude of the injury. Thus, small injuries can be compensated with small amounts of restoration, and larger injuries will scale to larger restoration efforts. We believe that by considering restoration-based options early in the damage assessment process and by applying scalable damage assessment methodologies the conflict between trustees and responsible parties will be reduced. These actions should provide a better framework for resolving key differences and they will focus the parties on getting to the bottom line more expeditiously.

One member of Subcommittee 1 suggests additional guidance on Recommendation # 4 as further discussed in Section 4, ADDITIONAL PERSPECTIVES ON SUBCOMMITTEE 1 QUESTIONS

5. DOI should ensure that all pertinent terms such as: individual, population, community, ecosystem, and habitat are defined in the regulations (see attached glossary of terms used in this document).

SECTION 4. ADDITIONAL PERSPECTIVES ON SUBCOMMITTEE 1 QUESTIONS

One member of Subcommittee 1 provides additional comments on the above Recommendation # 4: One approach to support habitat restoration or restoration-based strategies could be the development of policies or guidance that would provide the flexibility for DOI and other federal trustees to consider proactive, voluntary restoration actions that could be applied to compensatory restoration requirements at CERCLA sites. Coupling such innovative strategies with "practicable" approaches to injury assessment could, possibly, help to expedite NRD settlements nationally.

One member of Subcommittee 1 disagrees with several of the recommendations and conclusions stated above in Section 3: CONCLUSIONS AND RECOMMENDATIONS as follows:

The report as currently drafted does not acknowledge that because populations are the fundamental units of biological organization; population level assessments should usually be the focus of NRDA's when quantifying injury to biological resources under the Type B rule. In fact, the draft report does not adequately acknowledge that "injuries to individual organisms may be relatively easy to document, but are generally not as relevant ecologically as injuries sustained at the population level and above and thus generally do not affect the services provided by the resource. In most cases services are provided by populations, communities or ecosystems, not by individual organisms." Barnthouse and Stahl, "Quantifying Natural Resource Injuries and Ecological Service Reductions: Challenges and Opportunities" at p.3.

The report as currently drafted fails to acknowledge these issues and the related issue that there are substantial uncertainties associated with extrapolation of individual organism level effects to population or community level effects or service losses. The report as drafted fails to adequately address the uncertainties inherent in such

extrapolation despite the fact that one subcommittee member in support of the report's conclusions as currently drafted has published a peer-reviewed paper stating that "the transition of an effect from an organism to an ecological system is to transfer information between two structures with fundamentally different properties." W.G. Landis, "Uncertainties in the Extrapolation from Individual Effects to Impacts Upon Landscapes" Hum. Ecol. Risk Assess. Vol. 8, No. 1, 2002 at p. 195.

Instead of focusing upon these scientific shortcomings associated with an individual organism approach to injury quantification, the majority appears to justify its endorsement of injury quantification at the individual level by pointing out that some people have a strong attachment to individual organisms of some species, particularly "charismatic macrofauna." However, such economic issues of value are not relevant to the question of whether, as a matter of science, injury quantification at the individual level is a BAP for Type B NRDAs. The report as drafted takes these positions despite the fact that one of the subcommittee's scientist members has written that: "Without proper consideration of the population context, emphasis upon individuals leads to inaccurate assessments of risk." Landis WG. "Population is the Appropriate Biological Unit of Interest for a Species-Specific Risk Assessment" SETAC Ecological Risk Assessment Advisory Group Webpage, www.setac. org/eraag/era pop discourse 3.htm).

It is also important to note that the discussion of restoration-based scaling, including Habitat Equivalency Analysis ("HEA"), within recommendation #4 above goes far beyond the questions posed to Subcommittee #1, which address injury quantification. HEA is a method for estimating damages, not quantifying injury. NOAA Coastal Services Center webpage entitled "Habitat Equivalency Analysis" at page 2 (www.esw.noaa.gov/coastal/economics/habitategu.htm).

SECTION 5: REFERENCES

Barnthouse, L.W., and Stahl, R.G. 2002. Quantifying natural resource injuries and ecological service reductions: Challenges and opportunities. *Environmental Management* **30**: 1-12.

Blanck, H., and S. Wangberg. 1988. Induced community tolerance in marine periphyton established under arsenate stress. *Canadian Journal of Fisheries and Aquatic Sciences* **45**: 1816–1819.

Carlsen, T.M., J.D. Coty and J.R. Kercher. 2004: The spatial extent of contaminants and the landscape scale: an analysis of the wildlife, conservation biology, and population modeling literature. *Environmental Toxicology and Chemistry* **23**: 798–811.

Clarke K.R. (1999). Nonmetric multivariate analysis in community-level ecotoxicology. *Environmental Toxicology and Chemistry* **18**: 118-127.

Clements, W.H. and M.C. Newman 2002. Community Ecotoxicology. John Wiley and Sons, Chichester, United Kingdom.

Forbes, V.E., A. Palmqvist and L. Bach. 2006. The use and misuse of biomarkers in ecotoxicology. *Environmental Toxicology and Chemistry* **25**: 272–280.

Karr J.R. 1981. Assessment of biological integrity using fish communities. *Fisheries* **6**: 21-27.

Kapustka, L. A. 2005. Assessing ecological risks at the landscape scale: Opportunities and technical limitations. Ecology and Society 10(2): 11.
[online] URL: http://www.ecologyandsociety.org/vol10/iss2/art11/

Likens, G.E., 1992. The ecosystem approach: its use and abuse, Oldendorf/Luhe, Germany, Ecology Institute.

Maurer, B.A. and Robert D. Holt. 1996. Effects of chronic pesticide stress on wildlife populations in complex landscapes: processes at multiple scales. *Environmental Toxicology and Chemistry* **15**: 420–426.

Matthews, R. A. , W. G. Landis, G. B. Matthews. 1996. Community conditioning: an ecological approach to environmental toxicology. *Environmental Toxicology and Chemistry* **15**: 597-603.

Moriarty, F. Ecotoxicology: The study of pollutants in ecosystems. 1988. New York, Academic Press.

Munns, Jr., W. R. 2006. Assessing risks to wildlife populations from multiple stressors: overview of the problem and research needs. Ecology andSociety 11(1): 23. [online] URL: http://www.ecologyandsociety.org/vol11/iss1/art23/

Newman MC (2001). *Population Ecotoxicology*. John Wiley & Sons, Chichester, UK.

NOAA. 2005. 2005 Listing Determinations for 16 Pacific Salmon ESUs
http://www.spawnusa.org/cgi
files/0/pdfs/1119069805_NOAA__Listing_of_Salmon_Facts.pdf

Raimondo, S. and C. L. McKenney Jr. 2006. : From organisms to populations: modeling aquatic toxicity data across two levels of biological organization. *Environmental Toxicology and Chemistry* **25**:589–596.

Rapport DJ, Regier HA and Hutchinson TC 1985. Ecosystem behavior under stress. *American Naturalist* **125**: 617-640.

1061 Sparks TH, Scott WA and Clarke RT (1999). Traditional multivariate techniques:
1062 potential for use in ecotoxicology. *Environmental Toxicology and Chemistry* **18**: 128-
1063 137.
1064
1065 Spromberg, J. A., B. M. Johns and W. G. Landis. 1998. Metapopulation dynamics:
1066 indirect effects and multiple discrete outcomes in ecological risk assessment.
1067 *Environmental Toxicology and Chemistry* **17**:1640-1649.
1068
1069 Spromberg, J.A., and Meador, J.P. 2005. Relating results of chronic toxicity responses to
1070 population-level effects: modeling effects on wild Chinook salmon populations.
1071 *Integrated Environmental Assessment and Management* **1**:9-21.
1072
1073 Zedler, J. B., and S. Kercher. 2004. Causes and consequences of invasive plants in
1074 wetlands: Opportunities, opportunists, and outcomes. *Critical Reviews in Plant Sciences*
1075 **23(5)**:431-452.

1076 **FIGURE 2-1. BIOLOGICAL SCALES AND APPLICABLE TYPES OF**
1077 **MEASUREMENTS.**

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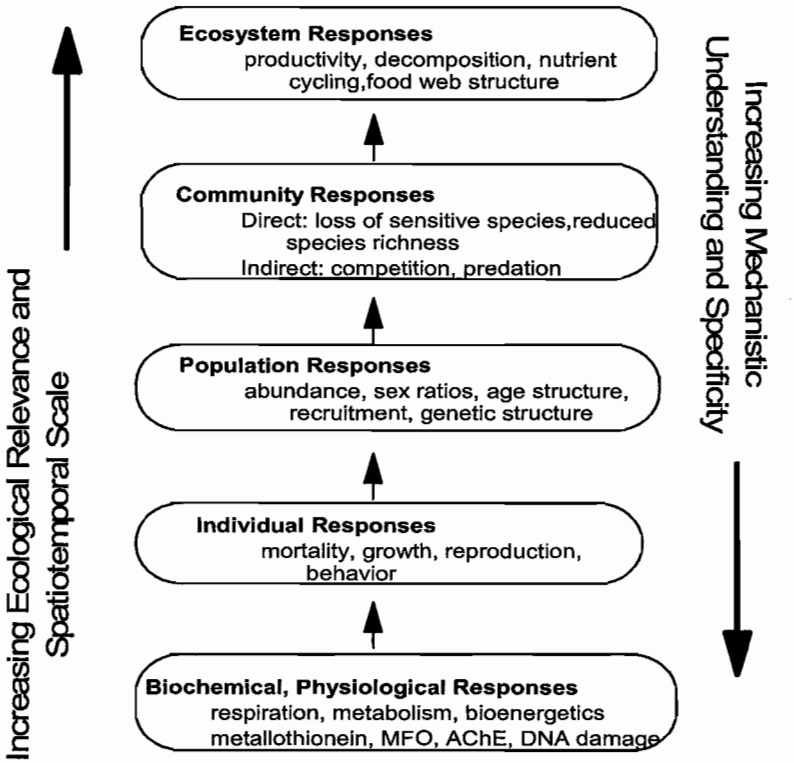

A. BIOGRAPHICAL SUMMARIES OF SUBCOMMITTEE MEMBERS

William H. Clements

Affiliation

Department of Fish, Wildlife and Conservation Biology, Colorado State University.

Education

Bachelor's Degree in Biology, Florida State University, Fresno; Master's Degree in Biology, Florida State University; Doctorate Degree in Zoology, Virginia Tech.

NRDA Case Experience

CERCLA (specific cases- Blackbird Mine, Idaho; California Gulch, Leadville, Colorado)

Barbara J. Goldsmith

Affiliation

President, Barbara J. Goldsmith & Company, Environmental Management Consulting Services; Director, Ad-Hoc Industry Natural Resource Damage Group

Education

Bachelor's Degree, George Washington University; Master of City Planning in Environmental Analysis, Harvard University (Joint degree program between Harvard School of Public Health; Kennedy School of Government; and Graduate School of Design)

Experience (CERCLA and OPA)

NRD-related briefings and policy formulation at the highest levels of the U.S. Government; coordinating the Ad-Hoc Industry Natural Resource Damage Group; preparing comments on emerging NRDA regulations and policies for individual companies and groups of companies, subsequently submitted to U.S. Government departments/agencies; establishing and managing PRP groups for sites involving NRD issues; assisting individual companies estimate their NRD liability, identify and retain experts, and providing litigation support to companies; managing the early NRDA activities for one of the largest Superfund sites in the country; providing briefings and serving as resource to over 15 national industrial trade associations on NRD related

issues; and developing methodological approaches to natural resource damage assessment.

Lisa N. Gover

Affiliation

Lisa N. Gover, Consultant

Education

Bachelor of Political Science, University of New Mexico; Juris Doctorate, School of Law, University of New Mexico

Experience (CERCLA)

Coordination of policy recommendations and research of the National Tribal Environmental Council's, Superfund Working Group – a committee of tribal government officials and their supporting attorneys, scientists, and other technicians involved in CERCLA NPL and other Superfund caliber sites with NRD claims on and near Indian lands.

Roger C. Helm

Affiliation

U.S. Fish and Wildlife Service, Chief, Branch of NRDA and Spill Response Region 1.

Education

Bachelor's Degree in Biology, California State University, Fresno; Master's Degree in Biology, Moss Landing Marine Laboratories; Doctorate Degree in Biological Ecology, University of California, Davis.

CERCLA Case Experience

Montrose/CA, Iron Mountain Mine/CA, Coeur d'Alene/ID, Commencement Bay/WA, Elliott Bay/WA, Cantara Loop/CA, United Heckathorn/CA, Holden Mine/WA, Leviathan Mine/CA

OPA/CWA Case Experience

Exxon Valdez/Exxon, *Apex Houston*/Apex Oil Company, *American Trader*/BP, *New Carissa*/Green Atlas, Santa Clara River/ARCO; *Kure*/Humboldt Bay; *Jin Shiang*

Fa/Rose Atoll; Santa Clara River/Mobil; Avila Beach/Unocal; Guadalupe Oil Field/Unocal, Pearl Harbor/Chevron, Barbers Point/Tesoro

Wayne G. Landis

Affiliation

Huxley College of the Environment, Western Washington University. Director Institute of Environmental Toxicology, Chair Department of Environmental Sciences.

Education

Ph. D. Zoology, Indiana University, Bloomington, IN 1979, M. A. Biology, Indiana University, Bloomington IN 1978. B. A., cum laude with Honors in Biology, Wake Forest University, Winston-Salem, NC 1974

CERCLA Case Experience

No CERCLA Experience

OPA/CWA Case Experience

Whatcom Creek, Bellingham WA

Relevant Study Experience

Regional scale risk assessments for Cherry Point WA, Willamette and McKenzie Rivers OR, Codorus Creek PA, Androscoggin River ME and NH, PETAR park in Brazil, Catchment in Tasmania, Australia, Lake Whatcom Bellingham WA, Trail smelter site British Columbia. Invasive species and GMO risk for the Chesapeake Bay, Mid Atlantic States, and central Oregon. Extensive research on the effects of toxicants at the population and community scales.

Robert W. Ricker

Affiliation

National Oceanic and Atmospheric Administration, Office of Response and Restoration, Acting Chief of Assessment and Restoration Division.

Education

Bachelor Degree in Botany, University of California, Berkeley; Ph.D. in Marine Botany, Melbourne University, Victoria, Australia.

CERCLA Case Experience

Castro Cove, CA; Commencement Bay, WA; Duwamish waterway, WA; Hudson River, NY; Iron Mountain Mine, CA; Montrose (Los Angeles), CA; Passaic River, NJ; Penobscot River, MA; Portland Harbor, OR

OPA/CWA Case Experience

ARCO/Santa Clara River; Bouchard/Buzzards Bay; Cape Mohican/San Francisco Bay; Evergreen/Charleston Harbor; Kure/Humboldt Bay; Jin Shiang Fa/Rose Atoll; Luckenbach; Mobil/Santa Clara River; PEPCO/Chalk Point; UNOCAL/Avila Beach 1 & 2; UNOCAL/Guadalupe Oil Field

Ralph G. Stahl, Jr.

Affiliation

E.I. du Pont de Nemours & Co., Principal Consultant.

Education

BS Marine Biology, Texas A&M University; MS Biology, Texas A&M University; Ph.D. University of Texas.

CERCLA Case Experience

Baileys Waste Site, TX; Palmer Barge Line, TX; DuPont Newport, DE; Tri-State Mining District, MO/KS/OK.

OPA/CWA/State-Lead Case Experience

Former Remington Gun Club, CT; Rio Tinto Mine Site, NV; Passaic River, NJ; NJ Groundwater, Statewide-8 Sites, NJ; East Branch, Grand Calumet River, IN.

Dale C. Young

Affiliation

Commonwealth of Massachusetts, Executive Office of Environmental Affairs, NRD Program Director.

Education

Bachelors of Science Degree, Environmental Science/Public Health, University of Massachusetts, Amherst. Graduate course work, Tufts University.

CERCLA Case Experience

Charles George Landfill NPL Site, MA; New Bedford Harbor NPL Site, MA; PSC Resources NPL Site, MA; Nyanza Chemical Waste Dump NPL Site, MA; General Electric/Housatonic River Site, MA; Colrain Sulfuric Acid Spill Site, MA; Holyoke Coal Tar Deposits Site, MA; Massachusetts Military Reservation NPL Site, MA.

OPA/CWA Case Experience

Bouchard 120/Buzzards Bay, MA; Hallmark/Mystic River, MA; Posavina Oil Spill, MA.

B. BIOGRAPHICAL SUMMARIES AND NOTES FROM OTHER PARTIES CONSULTED

The subcommittees of the DOI Federal Advisory Committee on Natural Resource Damage Assessment and Restoration have been charged with a number of key questions in DOI's implementation of CERCLA. Subcommittees have solicited input from experts outside the FACA Committee regarding relevant case experiences to help inform these evaluations. Specifically, Subcommittee #1 contacted the following NRDA practitioners to discuss case examples and advice in regards to their experiences in either the OPA or CERCLA context related to the Subcommittee's charge. The listing is provided in alphabetical order. In addition, The following text was provided to the parties consulted by Subcommittee #1 to guide the discussions:

"The Subcommittee 1 is charged w/ addressing: "What are the practicable steps to determine injury and damages to habitat and the various levels of biological scale (i.e., individual to ecosystem)?" We are therefore soliciting your input/response on the following questions to inform us on this issue:

In the past 10 years, how many NRDAs were focused on biological scale(s) at the individual level? How many at the population, community or ecosystem level? Please provide relevant NRDA case data in the attached "Q1 Case Matrix.

If you have been involved with NRDAs at the individual, population, community or ecosystem levels, what has been your experience- positive or negative with each?

For assessments at population or higher levels of biological organization, how were damages quantified and restoration actions scaled to the damages claimed?"

Michael C. Donlan

1. Biographical Summary

Affiliation

Principal, Industrial Economics, Incorporated.

Education

A.B., Geography modified by Economics, Dartmouth College

M.B.A., Stanford University.

CERCLA Case Experience

Several cases, including Montrose/CA, Duwamish/WA, St. Louis River/MN, Tri-State/KN, Tri-State/MO, Passaic River and Newark Bay/NJ, Hudson River/NY.

OPA/CWA Case Experience

Several cases, including *North Cape*/RI, Chalk Point/MD, *Athos*/MD/NJ/PA, Pago Pago/American Samoa.

Other Case Experience

United Nations Compensation Commission assessment of environmental damages arising from Iraq's 1991 invasion and occupation of Kuwait.

2. Discussion Summary

Background and Experience

- Works on mix of NRD cases, including oil spills and hazardous waste sites; of these, none have been based on population level impacts; 12-15 cases based on individual impacts. Also worked for United Nations on Gulf of War NRD issues.

Key Comments

- None of his cases involved estimating population reduction on statistical basis; Instead, generally look at # of individual losses; never taken additional step to determine if the loss affects the population. Case example: Montrose: DDT impacts on fish: Loss was quantified in terms of fish biomass; did not evaluate population impact.
- ERA: HQs are difficult to translate into service losses; inherently incorporate judgment calls. ERA focuses on high risk and not service loss. Try to rely on ERA but usually not enough information for NRD assessment.

- Usually select a couple representative species-indicators as proxy to understand injury

Recommendations based on earlier NRDA case work

- Need regulations to clarify NRDA process, with boundaries of some sort.
- Regulations should not require determining population level effects.
- Need to look @ service losses for NRDA.
- Recommend making NRD a Fact Finding or Arbitration Process vs. Litigation process.

Thomas C. Ginn

1. Biographical Summary

Affiliation

Exponent, Inc., Director and Principal Scientist, Ecosciences Practice.

Education

Bachelor of Science in Fisheries, Oregon State University, Corvallis, OR; Master of Science in Biological Sciences, Oregon State University, Corvallis, OR; Doctor of Philosophy in Biology, New York University, New York, NY

CERCLA Case Experience

Montana v. Arco (Clark Fork River/Anaconda)/MT; U.S. v Asarco et al. (Coeur d'Alene)/ID; Commencement Bay/WA; United Heckathorn/CA; Duwamish River/WA; Saginaw River/Bay/MI; St. Lawrence River (Massena)/NY; Ashtabula River/Harbor/OH; U.S. et al. v. Elkem Metals et al. (Ohio River)/OH and WV; FAG Bearing/MO; Shieldalloy Metallurgical Corporation/OH; Pools Prairie (Neosho)/MO; Koppers Texarkana/TX; SMC Newfield/NJ; Koppers Charleston/SC; Lake Hartwell, SC; Onondaga Lake/NY; Hudson River/NY; Alaska Pulp Corporation (Sitka)/AK.

OPA/CWA Case Experience

Pine Bend Refinery/MN; White River/IN

2. Discussion Summary

Background and Experience

- Ecotoxicology; Worked on NRDA since 1987 (devotes approximately 75% of

time), including 22 CERCLA cases and a few OPA/CWA cases. Involved in several large scale cases in litigation (Clark Fork, Coeur d'Alene, Ohio River) and many Cooperative Assessments (St Lawrence, Koppers, Duwamish)

Key Comments

- Important to distinguish between small-scale sites with limited data and larger CERCLA sites with broad scale contamination and high potential for litigation (especially those involving large-scale sediment contamination)
- Effort devoted to predicting effects at the individual organism level has not "paid off" in terms of measuring loss of services
    - Example: should not predict population decline from water quality (e.g., comparison to ambient water quality criteria) or individual toxicity data. Individual level approach does not work well: high level of uncertainty and difficult to translate service loss based on predicted effects; also difficulty in extrapolating effects on individuals to Community/Population service flows. Critical of using biomarkers for individual exposure. e.g., immunosupression, as an indicator of population effects or service loss
    - We have the ability to quantify effects at higher levels of organization;
        - Examples:
        - Sediment quality triad
        - Benthic community assessments
        - Hatching success and demographic analyses of birds ("pseudo-population" involves only breeding population in assessment area)
        - Field assessments of fish populations (abundance, age structure)
- Noted importance of proper experimental design for field studies, especially selecting reference sites to account for baseline conditions and consideration of statistical power; if not adequately designed; field studies cannot detect small effects
- Proponent of using gradient analyses (chemical concentrations or other stressor gradients) vs. reference sites (i.e., to establish baseline conditions). Frequently

used in oil spills, more difficult in complex CERCLA cases.

- Notes trends toward 1) assessments at population and community (latter for benthic organisms) levels of organization within NRDA; and 2) linking restoration to quantification of service loss. These trends are likely a result of improvements in our ability to conduct and design assessments at higher levels
- In favor of using weight of evidence approaches, but questioned how we determine the specific weighting of each component
- Involved in population studies to assess service losses. For some species, may require 4-5 breeding seasons; caution in studying just 1 season due to potentially high variability.

Recommendations based on earlier NRDA case work

- Success of NRDA settlement is not necessarily related to amount of data collected or the level of biological organization examined
- Studies at population and community levels have been successful; however, knows of no attempts to assess ecosystem level effects ("considered not especially valuable")
- Allow some flexibility in regulations depending on what level of organization that we care about
- There is a critical need for Technical Guidance on conducting assessments at higher levels of biological organization.
- Does not recommend extrapolating results of individual level tests (toxicity tests, Micro-tox Tests, Sediment Quality values) to higher levels of organization (Community, Population). The solution is to focus on resource of interest, e.g. If resource of concern is piscivirous birds, then focus on studying piscivirous birds and not on lower trophic levels..
- Conducting assessments at higher levels of organization does not speed up settlement, but may provide more appropriate data for making decisions and promotes greater cooperation.

Michael T. Huguenin

1. Biographical Summary

Affiliation

Harvard Center for Risk Analysis, Harvard School of Public Health, Executive Director

Formerly President, Industrial Economics, Incorporated.

Education

A.B. Physics, Washington University in St. Louis

M. Sc. Management, Massachusetts Institute of Technology

CERCLA Case Experience

Hudson River/NY, Montrose/CA, Iron Mountain Mine/CA, Commencement Bay/WA, Elliott Bay/WA, Massachusetts Military Reservation/MA, New Bedford Harbor/MA, Charles George Landfill/MA

OPA/CWA Case Experience

Exxon Valdez/Exxon, *Apex Houston*/Apex Oil Company, *North Cape*, Tampa Bay, Portland Harbor

Other NRD Experience

United Nations Compensation Commission, Geneva, evaluation of environmental damage in Kuwait, Iran, Jordan, & Syria caused by 1991 Gulf War

2. Discussion Summary

Background and Experience

- Formerly with Industrial Economics, presently with Harvard Center for Risk Analysis (April 10, 2006)
- Extensive experience on cases up until about 2000 including: Montrose, Exxon Valdez, North Cape, Hudson River, New Bedford Harbor. Since 2000 worked mostly on 1st Gulf War restoration/reparations

Key Comments

- Injury determination rarely focused on individual level except for rare/endangered and for macrofauna, e.g. birds and fish kills tend to evaluate at individual level. For small fauna would mostly look at community level impacts, ecosystem too big. NRDA can use/benefit from ERA.

Recommendations based on earlier NRDA case work

- Recommends against prescriptive regulations as science not advanced adequately, but recommend addressing 'uncertainty' somewhere in the regulations
- Recommends Fact Finding approach vs. Litigation context
- European Environmental Directive- the framework that Europe is using to base compensation claims from oil releases, is mostly based on OPA; Unaware of any process in Europe for compensation for hazardous waste releases.

Kenneth D. Jenkins

1. Biographical Summary (summary still pending interviewee approval)

Affiliation

BBL Sciences

Education: not provided

CERCLA Case Experience

Worked on 10 – 20 NRD cases, including Blackbird Mine, Clark Fork, and Montrose; currently involved in 7-8 ongoing NRD cases including Cooperative Assessments.

OPA/CWA Case Experience: not provided

Other NRD Experience: not provided

2. Discussion Summary

Key Comments

- Majority of experience in defining injuries for NRD cases has been at the level of individual organism. One exception is with fish injuries, which sometimes are measured by counts of impacted individuals, and losses are characterized at the population level (e.g., Clark Fork case). Recommends using several lines of evidence, e.g. fish kill, population survey, bioassay, pop studies; should not take individual line of evidence out of context.
- Documenting injuries at the population level is often complicated by difficulties in determining baseline (pre-incident) conditions. Important to account for patchiness in baseline environmental conditions.

- Analysis of spatial and temporal gradients can be useful for teasing out variables associated with contaminant releases; this approach has helped in past case discussions about site variables, baseline conditions, and uncertainties of exposure and contaminant related injuries.
- Limited experience documenting injuries at the community and ecosystem levels, with some work documenting injuries to benthics and plants at community level.
- Practicability in conducting and completing damage assessments moves us to use quicker and more definitive measures, which are generally at the level of the individual.
- Provided example from Housatonic PCB case of some ERA food web studies for birds. Data analysis in one instance demonstrated subtle reproductive impacts depending upon the statistical analyses performed. Study was limited to one point in time, which precluded answering questions about injury changes over time.

Recommendations based on earlier NRDA case work

- NRDA practitioners should work at the highest level of [biological] organization allowed by practicable constraints for documenting injuries and quantifying service losses.
- Injuries in the benthos should be documented at the community level rather than to specific benthic individuals.
- Use multiple lines of evidence to support injury claims, although these may conflict with one another (e.g., physiological changes, biomarkers, bioassays).
- When possible, use injury studies that account for spatial and temporal gradients of contaminant exposure; tease out variables of contaminant release(s) in light of existing environmental conditions.

Dr. F.E. Kirschner, LG, LHG

1. Biographical Summary

Affiliation

AESE, Inc. Technical representatives for various Native American governments

Education

BSc, Geology, University of Nevada Las Vegas

MS Hydrology, University of Idaho

Ph.D. Geology, University of Idaho

CERCLA Case Experience

Bunkerhill/Coeur d'Alene, ID; Midnite Uranium Mine, WA; Upper Columbia River, WA; Hanford, WA; Leviathan Mine, NV/CA; Sulphur Bank Mercury Mine, CA; Yerington Mine and Metallurgical Complex, NV; Tar Creek, OK; St. Regis, MN; Loring AFB, MA. Numerous other non-NRDA CERCLA cases

OPA/CWA Case Experience: *None*

2. Discussion Summary

Background and Experience

- *Has not personally been involved in cases that have been concluded. Therefore, a discussion on positive/negative aspects of the outcome would be premature. In most cases he has worked on, Tribes use a REA approach and scale the damages based on loss of resource days and loss of convenience. If replacement of equivalent off-reservation resources is contemplated as a compensatory mechanism (generally the reference areas), then damages from loss-of-rights tied to the land that are associated with the exercise of federally-reserved and protected rights must also be calculated.*

Key Comments

- *Tribes who rely heavily on natural resources for sustenance are inextricably linked with the immediate environment. Lands reserved for Tribes are the only lands in which these groups can exercise their federally-reserved and protected rights. These lands are the only places in which these groups can still legally harvest necessary resources. Such harvests are generally in excess of harvests on*

lands held by the general public rather than only during state-established seasons. For example, depending on the governing body, there are usually no bag limits on deer for western reservations. This means that a Tribal member must hunt on the reservation to provide necessary sustenance for the family.

- *The difference in reservation and state laws associated with the take of fish and game, essentially constrains the Tribal member to extract all of his resources from reservation lands—the land (abiotic resources) and the biologic resources located on the reservation is his life. In order to make the Tribal government whole, this means that compensation must ultimately restore the uses of resources on the reservation.*
- *Tribes generally manage resources on the reservation on both an individual and population-level bases. This is due, in part, because the resource-base is highly monitored and managed because of its great value (resources are almost always at risk due to over harvest).*
- *Concerns with on-reservation resources generally are first noted at the on-reservation population level by managers and users. For example, reduction in a given plant areal density may be noted. The manager then investigates the concerns on an individual basis.*
- *On reservations, Tribes are only concerned with the populations that are on the reservation or appertain to the reservation resources—our scope of concern is different than the federal partners.*

Recommendations based on earlier NRDA case work

- In order to make the Tribal government whole, compensation must ultimately restore the uses of resources on the reservation. If replacement of equivalent off-reservation resources is contemplated as a compensatory mechanism (generally the reference areas), then damages from loss of rights tied to the land that are associated with the exercise of federally-reserved and protected rights must also be calculated. This should include, but should not be limited to: (1) the cost of replacement of past and future services; (2) the cost associated with inconvenience of use; (3) the cost of putting the newly acquired lands into federal

trust, and (4) the cost of expanding the reservation boundaries to include these new lands.

Joshua Lipton

1. Biographical Summary

- BA Ecology, Middlebury College
- MS Natural Resources, Cornell University
- PhD Natural Resources/Environmental Toxicology, Cornell University

For more than 16 years, Dr. Lipton has been a central figure in the development and application of procedures for assessing natural resource damages, having served as lead scientist at many of the prominent NRDA investigations performed in the U.S. Dr. Lipton's expertise includes environmental toxicology and chemistry, ecology, and natural resources investigations. He has designed and directed laboratory and field toxicity tests, environmental sampling/monitoring studies, ecological field investigations, fisheries and wildlife population monitoring studies, and environmental modeling projects. Dr. Lipton is the author or co-author of numerous peer-reviewed articles in scientific journals as well as presentations at scientific meetings.

Affiliation

President and CEO of Stratus Consulting

Education

CERCLA Case Experience: extensive

OPA/CWA Case Experience: not provided

2. Discussion Summary

Background and Experience

- Has been involved in many dozens of NRD cases throughout the U.S., including large, litigated cases, small, expedited assessments, and cooperative assessments.
- Has been involved in many cases involving population and community-level injuries, as well as sites where assessment focus was on sub-population scales of organization.

D. RESEARCH MATERIALS USED FOR DISCUSSION/ANALYSES

E. GLOSSARY OF TERMS AND DEFINITIONS

Term	Definition
Individual	A particular being or thing as distinguished from a class, species, or collection. (*Webster's Seventh New Collegiate Dictionary.*)
Population	A group of individuals of one species in an area, though the size and nature of the area is defined, often arbitrarily, for the purposes of the study being undertaken. (Begon *et al.* 1996. *Ecology: Individuals, Populations, and Communities; 3rd Ed.*)
Community	The species that occur together in space and time. (Begon *et al.* 1996. *Ecology: Individuals, Populations, and Communities; 3rd Ed.*)
Habitat	Place where a microorganism, plant or animal lives. (Begon *et al.* 1996. *Ecology: Individuals, Populations, and Communities; 3rd Ed.*)
ERA	Ecological risk assessment is a process for systematically evaluating how likely it is that **adverse** ecological effects may occur as a result of exposure to one or more **stressors** (EPA, http://www.erg.com/portfolio/elearn/ecorisk/html/intro)
NRDA	Natural resource damage assessment is the process, often undertaken following the release of oil or regulated hazardous substances, by which trustees determine the nature and extent of injuries to natural resources and the restoration actions needed to reverse those losses (DARRP "Natural Resource Damage Assessment" one-pager 09/01/06)
Services	Natural resource services are those functions resources provide humans and/or other resources in the ecosystem. Examples of services include provision of feeding, breeding, and nursery habitat; primary and secondary production; nutrient cycling, and the opportunity for recreation. (pers. comm. Dr. Steve Thur, NOAA natural resource economist)
Acceptance criteria	
Ecosystem	A holistic concept of the plants, the animals habitually associated with them, and all the physical and chemical components of the immediate environment or habitat which together form a recognizable self-contained entity. (Begon

	et al. 1996. *Ecology: Individuals, Populations, and Communities; 3rd Ed.*)
Practicable	According to Black's Law Dictionary: practicable, adj. (of a thing) reasonably capable of being accomplished; feasible. Black's Law Dictionary, p. 1191. Seventh Edition, Bryan A. Garner (Editor in Chief). West Group Publishers, St. Paul, MN 1999.

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F. CLARIFICATION OF SUBCOMMITTEE ASSIGNMENT (INPUT FROM JOHN CARLUCCI REGARDING SUBCOMMITTEE'S ASSIGNMENT BASED ON DISCUSSIONS HELD AT THE JULY 26-27, 2006 FULL FACA COMMITTEE MEETING IN DENVER, COLORADO)

Roger,

Since you couldn't attend, you asked me for my recollection of the instructions given to subcommittee 1 after the last FACA Committee meeting in Denver.

It is fair to say that Pat Casano and I had a lot of input into the discussion after the subcommittee 1 presentation. Craig Potter, Barry Hartman, Lisa Gover, Bill Bresnick, Ralph Stahl, and others also had significant input -- along with Barbara and Dale.

It was pretty clear by the end that there were two focal points you're subcommittee was asked to deal with by the next meeting. In fact, I recall that Bill Bresnick summarized the charge and the end of the discussion, and there was agreement around the room.

The first focal point was an analysis of contrasting positions on the appropriate level for determining and quantifying natural resource injury. Craig Potter and Pat Casano articulated the position that the words "population, habitat, or ecosystem" in the current NRD regulations rightly represent a threshold for determining injury -- and that impairment to organisms below those levels is, in a sense, "per se" not significant (i.e., not constituting "injury" under the rule). The converse position -- posited by some trustee reps and me -- was that the OPA paradigm of "scaling" restoration to the level of injury determined (i.e., injury to a few organisms = a relatively small restoration, while injury validly determined to a larger scale of organization -- whether local or regional populations, communities, habitats, or ecosystems = a more robust restoration) makes identifying a threshold number of organisms that must be impaired for all cases in all places before a NRD can proceed irrelevant. I remember that at one point I characterized

Communities	Species diversity, Species richness, Dominance, Community composition, Habitat structure and function	High ecological relevance; may control ecosystem processes; strong theoretical background in disturbance ecology; variety of statistical approaches available for terrestrial, freshwater and marine systems; USGS GAP program has cataloged a number of communities and habitats and mapped some areas in great detail.	Arbitrary spatial and temporal scale; taxonomic difficulties for some groups; difficult to demonstrate causal relationship between stressors and community responses; assumption of community equilibrium not always valid; historical data for many sites are not available. Data analysis tools (multivariate statistics etc) may be not readily available to some practitioners.	Community is not well-defined for mobile species (most vertebrates) that are often the focus of NRDA injury studies; Many feedback loops within a community making causal relationships difficult to demonstrate; Difficult to establish baseline and return to baseline; generally requires long-term studies that may be cost-prohibitive for NRD settlement purposes. The community of interest in this case is straightforward to identify by understanding the habitat of the species of interest. For many vertebrate species there are descriptions of habitat--loss of habitat corresponds to a loss of community function that can reduce the numbers of the population of interest. **ADDITIONAL PERSPECTIVE:** Recommended for quantification of injury to some biotic groups. Most applicable to benthic macroinvertebrates and fishes. Potentially useful for small mammals and birds.
Ecosystems	Nutrient cycling Energy flow Decomposition Primary production Secondary production Spatial structure	High ecological relevance; responses are closely related to ecosystem services, especially nutrient cycling, climate, and the overall spatial structure of habitats. Remote sensing data are available for much of North America and the coastal regions; serves as an appropriate scale for examining the interactions of natural and human systems (urban areas and wildlands).	High variability; relative insensitivity; functional redundancy; low specificity to stressors; limited understanding of background conditions & underlying mechanisms; little agreement over which ecosystem processes are most important; relatively expensive analyses & often requires extensive computing resources; confounding factors make determination of causality problematic; data analysis tools are being developed & data are often @ different scales of spatial & temporal resolution.	Same issues as listed for community, only generally more internal feedback loops that result in a relatively higher degree of homeostasis; determining causal relationships to stressors and establishing baseline is problematic; generally requires long-term studies that may be cost-prohibitive for NRD settlement purposes. Homeostasis is no longer a recognized feature of ecological systems in most current models. Ecological systems are now generally recognized to be dynamic, patchy, and non-linear. The number of interactions may also lead to a system more vulnerable to rapid change. **ADDITIONAL PERSPECTIVE:** Not recommended for quantifying injury because of high costs, scientific complexity, lack of available tools, and interpretive difficulties.

Habitat	Habitat equivalency factors; Habitat suitability index models; GAP habitat criteria from remote sensing. Habitat can also be classified as to type (rocky intertidal, tidal, marine, etc.	Critical to the preservation & maintenance of populations & individuals. In certain circumstances the amount of available habitat can be used as a surrogate for estimating the size of a population within a geographic region. Habitat classification should be specific to the type of species being protected, restored or for which compensation is being sought. Habitat can be mapped with current remote sensing and geographic information system tools, and in some areas the information is widely available.	The habitat requirements of the species under consideration should be known. In some instances the mapping data may not be available. Presence of habitat does not mean that the species is in the area.	Habitat analysis has been the basis of many NRD Assessments, primarily based on the Habitat Equivalency Analysis (HEA) methodology. HEA is a useful tool for NRD application and settlement of cases. HEA addresses the type and scale of restoration and services to compensate for interim loss of resource. HEA input parameters are generally readily estimated, e.g. duration and extent of injury, reduction in quality and quantity of services normally provided by injured resources, recovery period, relative service levels of replacement resources. HEA provides a means for calculating compensation in lieu of determining dollar-value for habitat services. **ADDITIONAL PERSPECTIVE:** Recommended for quantifying injury and service losses when the release directly affects habitat quality and/or quantity, such as vegetation structure.

January 31, 2007 (corrected 2/9/07)

TO: Department of the Interior's FACA Committee on Natural Resource Damages

FROM: The Q2 Subcommittee -- John Bascietto, Bill Bresnick, Bill Brighton, Linda Burlington, Steve Kress, Craig Potter, Mark Shurtleff, Vicky Peters (with Paula Cotter), and Shannon Work

RE: Subcommittee Report on Question 2

THE QUESTION

The Question 2 (Q2) subcommittee was asked to address the following question:

> *Should DOI's Regulations provide additional guidance for determining whether direct restoration, rehabilitation, replacement, or acquisition of equivalent resources is the best strategy for addressing natural resource injuries?*

The subcommittee developed a list of eight embedded questions or issues, which was circulated to and endorsed by the full Committee (after the addition of question 6 below and reallocation of a question about regional restoration plans to the Question 4 Subcommittee), as follows:

1. Should there be mandatory "threshold criteria" for restoration alternatives instead of the current system of ten unweighted discretionary criteria?
2. Are there other revisions that should be suggested to the existing criteria for evaluating restoration alternatives?
3. Do we need to foster an earlier focus on restoration in the NRDA process? If so, how?
4. Should the NRDA process be made more compatible with the "integration" or coordination of response action planning with injury assessment and restoration planning, and if so, how?
5. Should there be a preference for on-site or in-kind restoration (or any other preference among alternative strategies for restoration/replacement/acquisition)?
6. Is more guidance needed on the appropriateness of projects that provide "services" (such as recreation) without enhancing natural resources?
7. Should DOI provide further guidance on what constitutes a "reasonable number of possible alternatives" for restoration, replacement, or acquisition of natural resources to be considered by the trustees?
8. Should there be a "grossly disproportionate to value" limitation on restoration projects?

This report presents consensus responses of the Q2 subcommittee to these eight questions, including recommendations for revisions to DOI's Type B natural resource damages assessment regulations ("Type B Rule") and for the development of non-binding guidance on certain issues that the subcommittee believes are better addressed outside the regulations.

EXECUTIVE SUMMARY

In general, the subcommittee believes that substantive revisions to the Type B Rule's decision factors for the selection of projects to restore, replace, or acquire the equivalent of injured natural resources should be disfavored. First, the existing decision factors, in 11 C.F.R. § 11.82(d), have already survived judicial review, and revising them may create a fresh opportunity for a challenge in the Court of Appeals. Second, the provisions of the existing Type B Rule for evaluating potential restoration/ rehabilitation/replacement/acquisition projects have the enormous benefit of allowing trustees broad discretion to tailor restoration plans to fit the unique circumstances of each case. In considering whether to provide additional guidance or to revise the Rule with respect to the selection of restoration alternatives, DOI should be careful to preserve that discretion.

Despite these reasons for caution in proposing substantive revisions, the subcommittee believes that DOI can provide constructive guidance that does not unduly constrain trustee discretion, through both non-binding guidance documents and revisions to the rule that build on the experience in restoration planning that federal, state, and tribal trustees, responsible parties, and public interest organizations have accumulated. Therefore, on balance, we recommend that DOI seriously consider revisions to the decision factors and related sections of the Type B Rule, including (1) the adoption of three threshold criteria that must be met by any restoration alternative; (2) revisions to several of the existing selection factors to make them more consistent with comparable factors in the Oil Pollution Act NRDA rule and to emphasize the key concept of nexus to the injury; and (3) several other revisions designed to encourage trustees to begin considering restoration options earlier in the assessment process and to improve coordination of natural resource damages assessment with the investigation and selection of response actions. We also recommend the issuance by DOI of new, non-binding guidance to aid trustees in evaluating certain restoration projects for lost services and to encourage the coordination of restoration with remediation.

As noted above, the subcommittee identified and examined eight sub-issues under Question 2. For the first four issues discussed below, we are recommending regulatory changes. For issues 5-7, we do not believe rule changes are need but instead suggest that DOI consider issuing informal guidance. For issue 8, we conclude no further action by DOI is needed.

1. Should there be mandatory threshold criteria for restoration alternatives instead of just the current system of ten unweighted discretionary criteria?

After much discussion, we concluded that alternatives that do not meet any one of the following three threshold criteria should be eliminated from consideration under § 11.82:

(1) Compliance with applicable Federal, State; and tribal law;

(2) Reasonable likelihood of success (in lieu of technical feasibility; see discussion below); and

(3) Demonstrable reasonable relationship to the injured resources giving rise to the claim for natural resource damages (in lieu of nexus; see discussion below).

These threshold or screening criteria are meant to establish a floor to be met by any alternative considered under § 11.82. The intention here is to limit the discussion of alternatives to those that are reasonably likely to succeed, are reasonably connected to the injury, and are, of course, legal.

2. Are there other revisions that should be suggested to the existing criteria for evaluating restoration alternatives?

If DOI decides to revise § 11.82 to add threshold criteria, then the subcommittee also recommends revisions to § 11.82(d) to more clearly reflect the subcommittee's conclusions. The current balancing factors should be revised in several respects in order to: (a) require trustees to consider the *strength* of the relationship between the alternative and injured natural resources (in addition to requiring that, at a minimum, a "reasonable" relationship exists); (b) incorporate a preference for actions that have long-term, sustainable benefits to natural resources and services; (c) make the Type B selection criteria more similar to those in the OPA NRDA rule, at 15 C.F.R. § 930.54(a); and (d) clarify other criteria in light of the trustees' experience since the criteria were promulgated. With the recommended modifications (underlined) incorporated, the section of the rule containing the balancing criteria would read as follows:

> *( ) Factors to consider when selecting the alternative to pursue.* When selecting the alternative to pursue, the authorized official shall evaluate each of the possible alternatives based on all relevant considerations, including the following factors:
>
> (1) <u>The likelihood of success of each alternative.</u> [This is identical to a factor in the OPA rule and would replace "Technical feasibility, as that term is used in this part."]

(2) The relationship of the expected costs of the proposed action to the expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.

(3) Cost-effectiveness, as that term is used in this part.

(4) The results of any actual or planned response actions.

(5) The extent to which each alternative will prevent future injury and avoid collateral injury as a result of implementing the alternative. [This is adapted with minor revisions from the OPA rule; and would replace "Potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other resources."]

(6) The extent to which each alternative will accelerate the recovery of resources and services in comparison with the natural recovery period determined in 11.73(a)(1) of this part. [Meant as a clarification; would allow deletion of current (7), which reads "Ability of the resources to recover without alternative actions."]

(7) The relative strength of the relationship between each alternative and the injured natural resources giving rise to the claim. [New: addresses the importance of nexus between the alternative and the injured resources.]

(8) The extent to which natural resource services provided by each alternative are sustainable over the long term. [New; incorporates a preference for permanence.]

(9) Potential effects of the action on human health and safety.

(10) Consistency with relevant Federal, State, and tribal policies.

3. Do we need to foster an earlier focus on restoration in the NRDA process? If so, how?

The subcommittee believes it is important for trustees to begin thinking about potential opportunities for restoration and the information needed to develop and assess restoration alternatives from the very start of the NRD assessment process. Under the existing Type B rule, however, trustees are first specifically directed to consider restoration alternatives in the Damages Determination Phase, which in a complex case may not occur until two years or more into the NRDA process. In order to highlight the need to initiate restoration planning early and to gather appropriate information at each point in the NRDA process, the subcommittee recommends that DOI make changes in several earlier parts of the Type B rule: add a new subsection (f) to 11.25 (Preassessment

Screen), and revise the text of sections 11.31 and 11.32 (Assessment Plan), 11.61 (Injury Determination), and 11.71 (Quantification).

4. Should the NRDA process be made more compatible with the integration or coordination of response action planning with injury assessment and restoration planning, and if so, how?

Close coordination of response action investigations and planning with natural resource damages assessment and the development of a restoration plan offers significant benefits not only to trustees and response agencies, but also to potentially responsible parties (PRPs). First, to the extent field investigations are designed to gather information simultaneously useful to both the response agency and the trustees, coordination of the response and restoration processes will help avoid redundancies and reduce costs. Second, where the response agency is able to take into account the trustees' assessment of injuries and the most appropriate restoration alternatives, it may often be possible to shape the response action to mitigate the natural resource injury and, therefore, reduce the need for further restoration and the size of the claim for damages. At the very least, simultaneous consideration of response and restoration options should allow the response agency and trustees to minimize the chance of inconsistency between their decisions and the risk that the level of contaminant removal selected for cleanup will be insufficient for restoration. An additional benefit is that closer coordination may increase the chances for a restoration-based settlement.

Achieving these benefits is not always easy. Obstacles include restriction on the use of appropriations and simple inadequacy of funding, confusion over similar but different regulatory missions, bureaucracy, concerns over legal authority, a project managers' lack of experience, or simple personality conflicts. Nonetheless, trustees, response agencies, and PRPs at many sites have increasingly worked to better coordinate the response and restoration processes, and two major agencies that often act as both the lead response agency and a natural resource trustee – the Department of Defense (DOD) and the Department of Energy (DOE) – have adopted policies favoring outright integration of the two processes, to the extent possible.

Obviously, DOI alone cannot compel response agencies to coordinate their efforts with trustees. However, the subcommittee finds that with appropriate guidance as to extant rule provisions, DOI can encourage greater trustee, PRP and responder cooperation, and can facilitate understanding by the parties of the opportunities for increased efficiencies and promotion of environmental benefits already offered by the rule. Therefore, the subcommittee recommends that DOI consider making revisions to several provisions of the Type B rule and adding a new provision that would explicitly encourage trustees to pursue early coordination and integration of response and restoration processes. In addition, DOI should provide guidance on how the response agency and trustees might coordinate to achieve a common data base, collective identification of data needs and data gaps, analysis of how the remedy will affect residual injury, how the remedy might be modified to lessen injury and residual damages, and early joint identification of possible restoration opportunities. Guidance should also

encourage the participating parties to consider developing written agreements that lay out the principles of how they will work together.

Our recommended new provision is as follows:

__. *Coordination of damages assessment with response action investigations and planning.*

i. Whenever practicable, prior to and during a remedial investigation or other investigation to support response action decisions, the affected trustee or trustees shall seek to coordinate with the lead response agency under the NCP to: (1) minimize duplication of sampling and other data collection efforts between the response investigations and damages assessment; and (2) help ensure that, to the extent appropriate, data and other information collected for the response investigations will also be useful for injury determination and restoration planning;

ii. Where appropriate, the affected trustee or trustees may seek to coordinate with the lead response agency under the NCP concerning the selection of response and restoration actions to: (1) minimize, or provide mitigation for, any potential adverse impacts of the response actions on natural resources; (2) avoid inconsistency between response and restoration actions to the greatest extent possible; and (3) select the most cost-effective combination of response and restoration actions consistent with the requirements applicable to each decision. Such coordination may occur in any manner agreed to by the lead response agency and the trustee or trustees and may include the issuance of a single, integrated decision document selecting both response and restoration actions.

5. Should there be a preference for on-site or in-kind restoration (or any other preference among alternative strategies for restoration/replacement/ acquisition)?

The subcommittee recommends that DOI issue non-binding guidance urging that trustees *consider* at least one on-site, direct (i.e., in-kind) restoration alternative in any case where response actions have not achieved full restoration to baseline.[1] However, we recommend against giving any substantive preference for on-site or in-kind restoration or otherwise adopting a hierarchy of approaches to restoration because that would unduly constrain the discretion of trustees to adapt restoration plans to the vast range of circumstances at contaminated sites and might impede the selection of more cost-effective and efficient restoration options. We also recommend against including any new requirement on this topic in the Type B rule because that would needlessly increase (even if only slightly) the rigidity of the restoration planning process.

[1] As explained under issue 7 below, we further recommend that this guidance urge trustees to consider, in every case, at least one off-site restoration, replacement, or natural resource acquisition alternative.

6. Is more guidance needed on the appropriateness of projects that provide "services" (such as recreation) without enhancing natural resources?

Certain types of "restoration" projects – particularly those that are intended to provide services to humans directly rather than through the enhancement or protection of natural resources – have caused controversy and raised questions about whether the proposed actions are consistent with the trustees' statutory mandate to restore, replace, or acquire the equivalent of the injured resources. For example, proposals to build community centers, educational facilities, boat houses or docks, parking lots near recreational areas, artificial ponds, or even an aquarium have attracted strong support from some community members or trustees but certainly do not directly restore or replace injured natural resources and, depending on the circumstances, may be legally-questionable uses of a natural resource damages recovery. We believe the addition of a "reasonable relationship" threshold criterion and the revisions to the balancing factors proposed above will give trustees an improved framework for evaluating the appropriateness of such proposals. Because those factors are necessarily fairly general, however, the subcommittee recommends that DOI also develop and issue non-binding guidance providing more detail on how trustees should evaluate several commonly-proposed types of "services restoration" projects, including research or educational programs and facilities; recreational amenities such as trails, cabins, restrooms, visitor centers, boat launches or piers, or parking facilities; and the stocking of sport fish to replace prior self-sustaining fisheries.

DOI should also address in guidance the problem of how to compensate for injuries to natural resources that are demonstrably of special cultural (including historical or religious) value to an Indian tribe or other citizens. Particularly when it is impossible, or will take a long time, to return the injured resources fully to baseline, the impact on cultural uses may be large and cannot necessarily be remedied by providing substitute natural resources. The subcommittee therefore recommends that DOI discuss this problem in guidance and affirmatively recognize that projects providing cultural services may be appropriate where cultural uses are lost, even with a more attenuated link to natural resource enhancement or protection than would be appropriate in other circumstances.

7. Should DOI provide guidance on what constitutes a "reasonable number of possible alternatives" for trustees to consider before making a decision on a restoration plan?

No change to the rule is needed on this issue, but non-binding DOI guidance would be appropriate and helpful to trustees. Such guidance should clarify that "a reasonable number of possible alternatives" is not a fixed number but will vary depending on the nature of the injury and the location of the natural resources injured. Normally, a reasonable range of alternatives should include at least one on-site alternative and at least one off-site alternative, as well as the "no action" alternative

presently required by the Type B rule. Where any of these types of restoration is not considered, the trustees should explain why that is.

8 Should there be a 'grossly disproportionate to value' limitation on restoration projects?

No. DOI's current requirements under 11.82(d)(2) to *consider* "[t]he relationship of the expected costs of the proposed action to [its] expected benefits[,]" and to select restoration projects that are cost-effective, adequately ensure that costs will be appropriately factored into decision-making. The imposition of a test to determine whether the cost of a restoration alternative is grossly disproportionate to the value of the loss would be counter-productive as it would undermine restoration-based analysis, which is widely supported and has led to timely and efficient settlements, and instead force the parties to use economic valuation methods that are often time-consuming, expensive, and generally controversial.

DISCUSSION

I. The Existing Legal Framework

Under DOI's Type B rule, the development of a restoration plan and the selection of natural resource restoration, rehabilitation, replacement, or acquisition alternatives are governed by 43 C.F.R. § 11.82 (fully reproduced in Attachment 1), whose current language was adopted in DOI's initial post-*Ohio* (*State of Ohio v. United States Department of the Interior*, 880 F.2d 432 (D.C. Cir. 1989)(*Ohio*)) rulemaking, 59 Fed. Reg. 14281 (March 25, 1994). Section 11.82(a) states in part that:

> The authorized official shall develop a reasonable number of possible alternatives for the restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured natural resources and the services those resources provide. . . . The authorized official shall then select from among the possible alternatives that he determines to be most appropriate based on the guidance provided in this section.

43 C.F.R. § 11.82(a). The alternatives that may be considered are limited to "those actions that restore, rehabilitate, replace, and/or acquire the equivalent of the injured resources and services to no more than their baseline, that is, the condition without a discharge or release. . . ." 43 C.F.R. § 11.82(b)(iii). The alternatives may "range from: intensive action . . . to return the various resources and services provided by those resources to baseline conditions as quickly as possible; to natural recovery with minimal management actions." 43 C.F.R. § 11.82(c)(1). Trustees must consider a "natural recovery" alternative in every case, 43 C.F.R. § 11.82(c)(2), and federal trustees are directed not to choose an alternative that requires the acquisition of land for federal management unless no restoration, rehabilitation, or replacement action is possible. 43 C.F.R. § 11.82(e).

The Type B rule provides a non-exclusive list of ten criteria for evaluating alternatives, as follows:

> *(d) Factors to consider when selecting the alternative to pursue.* When selecting the alternative to pursue, the authorized official shall evaluate each of the possible alternatives based on all relevant considerations, including the following factors:
>
> (1) Technical feasibility, as this term is used in this part.
>
> (2) The relationship of the expected costs of the proposed action to the expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.
>
> (3) Cost-effectiveness, as that term is used in this part.
>
> (4) The results of any actual or planned response actions.
>
> (5) Potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other resources.
>
> (6) The natural recovery period determined in 11.73(a)(1) of this part.
>
> (7) Ability of the resources to recover without alternative actions.
>
> (8) Potential effects of the action on human health and safety.
>
> (9) Consistency with relevant Federal, State, and tribal policies.
>
> (10) Compliance with applicable Federal, State, and tribal laws.

43 C.F.R. § 11.82(d). The rule provides no hierarchy among the ten listed factors, and, while all must be evaluated, none is mandatory in the sense that an alternative would have to be rejected if the individual factor is not satisfied.

Several challenges to Section 11.82 were raised and rejected in Kennecott Utah Copper Company v. U.S. Department of the Interior, 88 F.3d 1193 (D.C. Cir. 1996) ("Kennecott v. DOI"):

> -*No preference required for on-site restoration.* The Court agreed with DOI that trustees may choose among restoration, rehabilitation, replacement, and acquisition strategies without giving any one approach priority and, therefore, rejected arguments by the State of Montana that CERCLA should be interpreted to require a preference for physically

restoring resources over off-site replacement or acquisition of comparable resources. *See* Kennecott v. DOI, 88 F.3d at 1229.

-*Consistency with response actions must be considered but is not an absolute limitation.* While endorsing the rule's direction to trustees to *consider* the effects of any actual or planned response actions, the Court rejected arguments that the rule must require consistency between restoration plans and cleanup decisions in every case. *See* 88 F.3d at 1219 (Although consistency between restoration and response actions is generally desirable, some degree of inconsistency may at times be necessary, "particularly where short-term and long-term considerations dictate seemingly conflicting responses (e.g., grass to prevent erosion, followed by reforestation, which kills the grass).").

-*"Grossly disproportionate to value" test rejected.* The Court also declined to require DOI to include an exception to the general rule that trustees should seek to return the injured resources and services to baseline where the costs of full restoration/replacement, and/or acquisition would be "grossly disproportionate" to the value of the injured resources. *See* 88 F.3d at 1218. The Court found that the decision criteria provided by the rule, which include the requirement that trustees consider "[t]he relationship of the expected costs of the proposed action to [its] expected benefits . . . [,]" are sufficient to exclude unreasonably costly actions. Id.

NOAA's rule for natural resource damages assessments under the Oil Pollution Act ("OPA") provides an overlapping, but in some respects different, set of criteria. The OPA rule requires that every project satisfy two threshold criteria:

(a) the alternative must be technically feasible, and

(b) the alternative must comply with applicable laws.

15 C.F.R. § 930.53(a)(2). Alternatives that pass the threshold criteria are then to be evaluated based on, at a minimum:

(1) The cost to carry out the alternative;

(2) The extent to which the 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.

15 C.F.R. § 930.54(a) (*see* Attachment 2).

II. Subquestions Addressed by Q2 Subcommittee

A. Should there be mandatory threshold criteria for restoration alternatives instead of just the current system of ten unweighted discretionary criteria?

The subcommittee proposes an approach similar to the approach in the OPA regulations, which identify technical feasibility (as defined there) and compliance with law as threshold criteria and then focus on identification of a range of restoration alternatives prior to the application of the evaluation criteria. The threshold criteria are really in the nature of screening criteria to be used to qualify a reasonable set of alternatives for further consideration based on the application of the other criteria. In general, we prefer this approach because it allows the trustees to eliminate plainly-inappropriate proposals early, before undertaking the more extensive analysis necessary to apply the full set of decision factors.

In addition to the OPA Rule's threshold criteria, we think it is desirable to adopt a threshold requirement that there be a clear nexus or linkage of any alternative to the trustees' goals of returning injured natural resources and their services to baseline conditions, and we commend this approach to the Committee.

(1) Compliance with Applicable Law

Unlike CERCLA's permit exemption for remedial actions, restoration actions must comply with existing law. Therefore the establishment of this criterion as an initial screen makes sense.

(2) Reasonable likelihood of success

Originally we had considered technical feasibility to be a strong candidate as a threshold criterion, but given what we saw as a problematic definition of technical feasibility in Part 11, we decided to eliminate it altogether as a restoration selection factor in § 11.82(d) rather than attempt to redefine the term in § 11.14(qq). In general, we concluded that the existing definition might have a chilling effect on innovation and that a better and more realistic approach would be to require that a restoration plan has a reasonable chance of successful completion in an acceptable period of time. As a result, we recommend the substitution of likelihood of success for technical feasibility as a criterion in § 11.82(d)(1).

(3) Demonstrable reasonable relationship to the injured resources giving rise to the claim for natural resource damages

The adoption of this threshold criterion is intended to be consistent with our views on the importance of having a reasonable nexus between the restoration and the injuries. Since CERCLA requires that trustees demonstrate some linkage between the resource injuries and proposed restoration, we decided, after considering the OPA approach, to recommend elevating this requirement to threshold criterion status. Therefore, instead of requiring the somewhat abstract and potentially troubling concept of a nexus, we embraced what we regard as clearer and more definitive language.

Accordingly, after much discussion, we concluded that alternatives that do not meet any one of the following three threshold criteria should be eliminated from consideration under § 11.82:

(1) Compliance with applicable Federal, State; and tribal law;

(2) Reasonable likelihood of success (in lieu of technical feasibility; see discussion below); and

(3) Demonstrable reasonable relationship to the injured resources giving rise to the claim for natural resource damages (in lieu of nexus; see discussion below).

The applicability of these threshold or screening criteria is intended to establish a floor to be met by any alternative to be considered under § 11.82. The intention here is to limit the discussion of alternatives to those that are reasonably likely to succeed, are reasonably connected to the injury, and are, of course, legal. Projects passing this screen could then be included in a reasonable range of alternatives that would then be evaluated using balancing factors similar to those in § 11.82(d) of the existing Type B rule.

The subcommittee did not resolve where in the regulations the new threshold criteria should be added. One possibility is revision of 11.82(c), which could be rewritten to more clearly reflect our conclusions. Further clarification could also be added as § 11.82(b)(3), which currently describes the steps to be taken in developing a reasonable number of possible alternatives.

B. Are there other revisions that should be suggested to the existing criteria for evaluating restoration alternatives?

As noted above, the recommended threshold criteria would act as a screening mechanism in the sense that only alternatives that meet all three threshold criteria would be eligible for further consideration based on the application of the other criteria. Qualifying projects should then be evaluated using factors similar to those in § 11.82(d) of the existing Type B Rule. The application of these non-threshold criteria should be accomplished in a manner that allows careful consideration of the relative strengths of each alternative. The application of criteria at this point is, in effect, a balancing test.

While the subcommittee supports the inclusion of both threshold criteria and balancing factors in the rule, we believe that the current balancing factors should be revised in several respects in order to: (a) require trustees to consider the *strength* of the relationship between the alternative and injured natural resources (in addition to requiring that, at a minimum, a "reasonable" relationship exist); (b) incorporate a preference for actions that have long-term, sustainable benefits to natural resources and services; (c) make the Type B selection criteria more similar to those in the OPA NRDA rule, at 15 C.F.R. § 930.54(a); and (d) clarify other criteria in light of the trustees' experience since the criteria were promulgated.

a. *Is there a need for regulatory revisions or only for non-binding guidance?*

In general, substantive revisions to the Type B rule's decision factors in § 11.82(d) should be disfavored. First, the existing decision factors have already survived judicial review, and revising them may create a fresh opportunity for a challenge in the Court of Appeals. Second, no one has complained that the existing factors unduly constrain trustees' discretion to fashion a restoration plan to fit the specific facts of each case. As discussed above, the subcommittee strongly believes this discretion is highly desirable and important to preserve. Moreover, DOI can effectively mitigate at least part of the problem described above through non-binding guidance. Nonetheless, if DOI adopts this subcommittee's recommendation to adopt threshold criteria, we further recommend that the agency consider modifications to the decision factors currently in the rule for the following reasons:

First, trustees appear to have made very little formal use of the Type B decision factors in assessments (one of the few being Fox River/Green Bay), which suggests that they have not viewed the factors as providing valuable guidance. This lack of use also means that the factors can be revised without concern about losing the benefits of extensive precedents or an established "practice."

Second, the existing Type B balancing factors do not explicitly address key issues that are inherent in the restoration planning process. Perhaps most importantly, the rule does not require trustees to evaluate the extent to which an alternative will provide *long-term* benefits to the ecosystem and the public). In addition, the rule provides little guidance on how to evaluate several specific types of "restoration of human services" alternatives that have been suggested repeatedly in individual cases, including proposals to construct buildings or other facilities for research or educational programs, or to fund the programs themselves; the construction of recreational amenities such as trails, cabins, restrooms, visitor centers, boat launches or piers, or parking facilities; programs to stock fish species popular for recreation or to build or fund the operation of fish hatcheries; and proposals to fund programs, such as park maintenance or sewage treatment plant upgrades, that are also a normal part of the responsibilities of trustee agencies or of sister government agencies. While it would be impractical to address all such issues directly in a workable list of decision factors, the rule should at least provide an intellectual framework that makes it easier for trustees (and the public) to analyze such issues in light

of the rule's overall objectives and policies. In the subcommittee's view, the existing criteria do not provide such a framework.

Third, to the extent any revisions to the Type B rule are being considered, this is an opportunity to narrow the differences between DOI's rules under CERCLA and comparable provisions of the NRDA rule under OPA. The restoration planning processes under CERCLA and OPA present essentially identical procedural and substantive issues. Nonetheless, the CERCLA and OPA rules contain significantly different criteria for selecting among restoration alternatives. To the extent practicable, it seems desirable to make the decision criteria for restoration planning under CERCLA and OPA more similar to one another and to develop guidance common to both processes.

Therefore, in addition to adding threshold criteria, the subcommittee also recommends revisions to § 11.82(d) to provide more practical assistance in choosing among potential alternatives.

b. *What rule revisions should be considered?*

To narrow the focus of our discussion of possible revisions, we used two "ground rules": (1) Add to or change existing criteria only to address a specific omission or other deficiency; and (2) look first to the OPA rule for potential revised criteria and craft new language only when that rule does not fully address the identified deficiency. Applying these ground rules we recommend the addition of selection factors for two particularly significant issues that, as noted above, the existing Type B rule does not directly address:

- the relationship (or "nexus") between a proposed alternative and the injured natural resources and the services they provided, and
- the extent to which an alternative will provide long-term benefits to the ecosystem and the public.

Nexus

The first element missing from the existing decision factors – the degree of nexus between an alternative and the injury – is central to the analytical framework that trustees need to address the "human services" projects described above. Our proposal (described under question 3 above) to adopt a threshold criterion allowing trustees to consider only those alternatives that have a "demonstrable reasonable relationship" to the injured natural resources should screen out projects that are plainly inconsistent with the statutory requirement to use recoveries only for restoration. That should not be the end to the analysis of "nexus," however. Rather, we believe trustees should go on to compare alternatives by *how close* or *how strong* the nexus is – i.e., how close will each proposed alternative come to achieving the trustees' core objectives of returning injured resources and/or the services they provided to baseline, and compensating for interim losses. The closer the connection between the alternative and the specific injury at issue in the case, the clearer it is that the project is appropriate. On the other hand, if the trustees cannot

articulate a relationship between an alternative and specific injured resources or lost services of the injured resources, that alternative would not be favored under the proposed decision matrix, and other alternatives should be explored.

Accordingly, we suggest adding a new decision factor similar to the following: "The relative strength of the relationship between each alternative and the injured natural resources giving rise to the claim."

Long-term nature of benefits

At the heart of the natural resource damages provisions of CERCLA and OPA are two principles: that the government (federal, state, and tribal) holds or manages natural resources as a "trust" for the benefit of the public; and that the only appropriate way to vindicate the public's interests when this trust is injured is to rebuild the trust (which can be done either by directly repairing the specific injured resources or by somehow creating or making available equivalent resources). Both of these principles imply that the public interests in natural resources protected by these statutes are, in many cases, long-term, or even essentially (from our limited human perspective) permanent. That, in turn, suggests that trustees should strongly favor restoration alternatives that promise enduring improvements or protections of natural resources, with benefits to future generations counting at least as heavily as benefits to the current population. None of the existing Type B decision criteria, and none of the OPA criteria, reflects this fundamental point in any way.

To fill this void, we recommend that DOI consider adding a new criterion similar to the following: "the extent to which the natural resource services provided by each alternative are sustainable over the long term." This formulation would not necessarily preclude trustees from selecting an alternative that provides only temporary benefits, *e.g.* as compensation for interim losses that fell heavily on an identifiable community, or projects that are inherently vulnerable to natural destructive forces (such as coastal marsh projects in Louisiana). However, it would in effect force trustees to articulate specific reasons for selecting actions with only short-term benefits and, appropriately, put pressure on them to give greater consideration to alternatives that will hold up for the long run.

Other potential improvements

If DOI decides to pursue rulemaking, the subcommittee suggests that the agency also consider the following revisions, in order of priority.

(a) Amend factor (6) in the current rule to read (new language underlined): The extent to which each alternative will accelerate the recovery of resources and services in comparison with the natural recovery period determined in 11.73(a)(1) of this part. This revision makes clear the purpose for which the natural recovery period is being considered. It would also allow the deletion of factor (7) in the current rule, which reads "Ability of the resources to recover

without alternative actions." That factor adds nothing to the analysis required under the amended sixth factor, and deleting it would not be a substantive change – but would keep the number of decision factors from growing.

(b) Substitute for criterion (1) ("Technical feasibility, as that term is used in this part") the comparable criterion from the OPA rule: "the likelihood of success of each alternative." This change would require trustees to take into account differences in the probability that various restoration alternatives will hold up without further action, while recognizing that the art/science of natural resource restoration is at a relatively early stage of development and that it will sometimes be appropriate for trustees to select actions that have not yet been proven to the point that they clearly satisfy the "technically feasible" standard as defined in the existing rule.

(c) Replace criterion (5) in the existing Type B rule ("Potential for additional injury . . .") with "The extent to which each alternative will prevent future injury and avoid collateral injury as a result of implementing the alternative." This language is very similar to criterion (4) from the OPA rule ("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[.]"). However, we suggest deleting the phrase "as a result of the incident" in the OPA rule language because trustees should be permitted to consider the benefits of preventing future injuries from any cause, not just those resulting from the original incident.

[Note that factor (10) in the current version of Section 11.82(d),"Compliance with applicable Federal, State, and tribal laws," would no longer be needed as a balancing factor if it is adopted as a threshold criterion in accordance with the subcommittee's recommendation.]

With the recommended modifications (underlined) added, the section of the rule containing the balancing criteria would read as follows:

( ) Factors to consider when selecting the alternative to pursue. When selecting the alternative to pursue, the authorized official shall evaluate each of the possible alternatives based on all relevant considerations, including the following factors:

(1) The likelihood of success of each alternative. [This is identical to a factor in the OPA rule and would replace "Technical feasibility, as that term is used in this part."]

(2) The relationship of the expected costs of the proposed action to the expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.

(3) Cost-effectiveness, as that term is used in this part.

(4) The results of any actual or planned response actions.

(5) The extent to which each alternative will prevent future injury and avoid collateral injury as a result of implementing the alternative. [This is adapted with minor revisions from the OPA rule; and would replace "Potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other resources."]

(6) The extent to which each alternative will accelerate the recovery of services in comparison with the natural recovery period determined in 11.73(a)(1) of this part. [Meant as a clarification; would allow deletion of current (7), which reads "Ability of the resources to recover without alternative actions."]

(7) The relative strength of the relationship between each alternative and the injured natural resources giving rise to the claim. [New: addresses the importance of nexus between the alternative and the injured resources.]

(8) The extent to which natural resource services provided by each alternative are sustainable over the long term. [New; incorporates a preference for permanence.]

(9) Potential effects of the action on human health and safety.

(10) Consistency with relevant Federal, State, and tribal policies.

C. Do we need to foster an earlier focus on restoration in the NRDA process? If so, how?

Under the existing Type B rule, trustees are first specifically directed to begin considering restoration alternatives during the Damage Determination Phase, when they prepare a Restoration and Compensation Determination Plan ("RCDP"). *See* 43 C.F.R. § 11.80. Where the trustees are following the rule step by step, this consideration would typically occur two years or more into the NRDA process. The subcommittee considered various ways to require, or at least encourage, screens for restoration opportunities earlier in the process, possibly beginning at the preassessment stage. Such a change would foster early restoration-based settlements, would help ensure timely identification of alternatives that might become unavailable if not acted on early (e.g., valuable habitat available for purchase, which might be acquired for development if the trustees do not act early), may facilitate the incorporation of restoration into remedial planning, and would allow the trustees to design the assessment to provide the information needed to evaluate the identified restoration possibilities.

Since all damages recovered must be spent on some restoration activity, it makes sense that evaluating potential restoration actions provide the focus of an assessment. An assessment that enables appropriate matching and scaling of lost resources and services to potential restoration gains would validate trustee determinations regarding those actions that will make the environment and public whole, ensure that appropriate assessment procedures for determining restoration actions for a given incident are followed, and reduce transaction costs. An early restoration focus will facilitate recovery of damages, while still allowing trustees the discretion to apply whatever assessment approach is most appropriate to the particular natural resources and services injured by a given incident. It does not benefit the natural resources or the public if monies are collected without a view toward how they will be spent, or if sufficient funds to implement any meaningful action are not collected.

The subcommittee believes it is important for trustees to begin thinking about potential opportunities for restoration and the information needed to develop and assess restoration alternatives from the very start of the NRD assessment process. In order to highlight the need to initiate restoration planning early and to gather appropriate information at each point in the NRDA process, the Subcommittee recommends that DOI make changes in several earlier parts of the Type B rule:

First, the trustees are required to complete a Preassessment Screen Determination (PASD), based upon readily available information that will document the decision as to whether to proceed with an assessment. Sections 11.25 (a) – (e) require trustees to identify potential pathways of exposure and exposed areas, to estimate concentrations, and to identify potentially affected resources. In particular, § 11.25 (e)(2) provides:

> A preliminary estimate, based on information readily available from resource managers, of the services of the resources identified as potentially affected shall be made. This estimate will be used in determining which resources to consider if further assessment efforts are justified.

Trustees presumably will not conduct preliminary estimates in cases where they have determined that a release does not justify an assessment. In such situations, scoping of potential restoration actions would likewise be inappropriate. However, where PASDs conclude further assessment is justified, an early focus on restoration should be encouraged. We recommend that § 11.25(f) be added to the regulation to read as follows:

> § 11.25 Preassessment screen—preliminary identification of resources potentially at risk.
>
> (f) Potential restoration actions
>
> To the extent practicable, a preliminary identification of potential restoration projects or project types, based on information readily available, shall be made. These

> projects should be considered as appropriate to guide further assessment activities and restoration planning.

Obviously, data will be incomplete at the end of the Preassessment Phase. However, in most cases, the trustees will be able to foresee the general types of restoration that may be available for the types of likely resource injuries. If there are insufficient data to identify appropriate restoration actions, the trustees can so indicate. The main purpose of adding the language above to § 11.25 is to encourage trustees to focus on restoration early in the assessment process.

Once trustees determine that an NRDA is warranted, they are to develop an Assessment Plan, but before doing so, they are to send a Notice of Intent to Perform an Assessment to all identified potentially responsible parties. We suggest amending § 11.32(a)(2)(iii)(A) to provide as follows:

> The Notice shall invite the participation of the potentially responsible party, … in the development of the … assessment….The Notice shall briefly describe, to the extent known, the site, vessel, or facility involved, the discharge of oil or release of hazardous substance of concern …,the resources potentially at risk, *and, if practicable, potential restoration projects or types of projects that would provide appropriate compensation for injuries to natural resources.* The Notice shall also contain a statement of authority for asserting trusteeship… over those natural resources identified as potentially at risk.

Including initial identification of potential restoration projects in the Notice could spur potentially responsible parties to consider early restoration-based cooperative assessments and/or settlement of potential claims, thereby jump-starting actual restoration.

Where further assessment is appropriate, the regulations should consistently encourage a focus on restoration. For example, the purpose of the Assessment Plan is stated in § 11.30; it could be modified as follows:

> The purpose of the Assessment Plan is to ensure that the assessment is performed in a planned and systematic manner, that methodologies selected … can be conducted at a reasonable cost,…, *and that restoration planning can occur as soon as practicable in the NRDA process.*

In addition, § 11.31 gives guidance on the content and level of detail in the Assessment Plan. A phrase could be added to § 11.31(a)(2) to remind the trustees that the focus of the assessment is restoration, as follows:

§ 11.31 What does the Assessment Plan include?

(a) General content and level of detail. (1) The Assessment Plan must identify and document the use of all of the type A and/or type B procedures that will be performed.

(2) The Assessment Plan shall be of sufficient detail to serve as a means of evaluating whether the approach used for assessing the damage is likely to be cost-effective and meets the definition of reasonable cost, as those terms are used in this part. The Assessment Plan shall include descriptions of the natural resources and the geographical areas involved, *and potential restoration projects or project categories that would likely provide compensation for the injured resources.* The Assessment Plan shall also include a statement of the authority for asserting trusteeship, or co-trusteeship, for those natural resources considered within the Assessment Plan. The authorized official's statement of the authority for asserting trusteeship shall not have the force and effect of a rebuttable presumption under 11.91(c) of this part. In addition, for type B assessments, the Assessment Plan shall include the sampling locations within those geographical areas, sample and survey design, numbers and types of samples to be collected, analyses to be performed, preliminary determination of the recovery period, and other such information required to perform the selected methodologies.

In the next section, § 11.32(f)(2) requires trustees, at the completion of the Injury Determination Phase, to review the methodologies for the Quantification and Damage Determination Phases to ensure that these methodologies remain consistent with the results of the Injury Determination Phase and with the requirements of reasonable costs. The focus on restoration could be included in these requirements as follows:

§ 11.32 How does the authorized official develop the Assessment Plan?

(f) Plan review. (1) After the Injury Determination phase is completed and before the Quantification phase is begun, the authorized official shall review the decisions incorporated in the Assessment Plan.

(2) The purpose of this review is to ensure that the selection of methodologies for the Quantification and Damage Determination phases is consistent with the results of the Injury Determination phase, that the use of such methodologies remains consistent with the requirements of reasonable cost, as that term is used in this part, *and that the selected methodologies provide information pertinent to restoration decisions.*

Next, § 11.61 introduces the Injury Determination phase. Under § 11.61(b) -- Purpose, the following language could be added to encourage Trustees to design injury assessments so as to facilitate the development and scaling of restoration actions. For example,

> The purpose of the Injury Determination phase is to ensure that only assessments involving well documented injuries resulting from the discharge of oil or release of a hazardous substance proceed through the type B assessment, *and that data gathered for injury determination, for example, target species, key service losses, and metrics for calculating losses, be appropriate for the development and scaling of restoration projects.*

Similarly, § 11.71, Quantification phase -- service reduction quantification, provides another opportunity to integrate restoration planning earlier into the process. We recommend amending § 11.71(d)(3) as follows:

> Selection of resources, services, and methodologies. Specific resources or services to quantify and the methodology for doing so should be selected based upon the following factors:
>
> > Consistency of the measurement with the requirements of the economic *or restoration scaling* methodology to be used, ...

D. Should the NRDA process be made more compatible with the integration or coordination of response action planning with injury assessment and restoration planning, and if so, how?

The subcommittee supports coordination of response actions and restoration to reduce the likely need for "second clean ups," and to maximize opportunities for efficiency and minimization of cost by evaluating remedies at the same time as restoration needs. Specifically, the subcommittee recommends that DOI consider promulgation of a new provision that would explicitly encourage trustees to pursue early coordination and integration of response and restoration processes. DOI should also provide guidance on how the response agency and trustees might coordinate to achieve a common data base, collective identification of data needs and data gaps, analysis of how the remedy will affect residual injury, how the remedy might be modified to lessen injury and residual damages, and early joint identification of possible restoration opportunities. Guidance should also encourage the participating parties to consider developing written agreements that lay out the principles of how they will work together.

Background

Natural resource damage assessment and restoration are usually implemented by trustees after the response actions have been selected. Unlike either the U.S.EPA or the trustees, a potentially responsible party (PRP) is involved in both of these regulatory processes and therefore is concerned about possible inconsistency – a cleanup that must be partly undone to restore, or one that makes natural resource injury worse. Also, there is a perception (only infrequently realized) that the current NRDA regulation represents a kind of "second clean up." However, the much more common experience is lost

opportunity for efficiency and minimization of cost when the remedy is selected before and without regard for restoration needs.

Close coordination among trustees and PRPs and "integration" of natural resource concerns into response actions is a possible solution to the problems of perception and lost opportunity. Trustees frequently have expertise that can be helpful to both the response agencies and the PRPs. Earlier coordination of the response and restoration processes and early integration of natural resource trustee concerns will help avoid redundancies in the two processes. Both PRPs and the trustees are motivated to define and limit work scope and reduce assessment costs. An additional benefit is that with closer coordination and integration comes an increase in the chance for a restoration-based settlement. That is because the scope of the necessary restoration actions may emerge from an integrated process sooner rather than later.

Some obstacles to integration of response and restoration were identified. Lack of funding, confusion over similar but different regulatory missions, bureaucracy, concerns over legal authority, a project managers' lack of experience, or simple personality conflicts are a few examples. However, the committee finds that with appropriate guidance as to extant rule provisions, DOI can encourage greater trustee, PRP and responder cooperation, and can facilitate understanding by the parties of the opportunities for increased efficiencies and promotion of environmental benefits already offered by the rule. For example, in coordination with response authorities, the parties should look for opportunities to perform early scoping of possible restoration assessment action. Coordination may even evolve into an invitation for early trustee involvement with remedial data collection and feasibility planning. Remedial investigations performed with trustee input are more likely to provide useful information for an Assessment Plans.

Under CERCLA, clean up of contamination works to prevent or reduce risks to human health and the environment, and natural resource restoration aims to compensate the public by restoration or replacement of those natural resources injured or lost due to the contamination. The natural resource damage assessment and restoration are usually implemented by trustees after the response actions to clean up hazardous waste sites have been selected. The result can be a process tilted toward after-the-fact (of response) restoration actions, lost opportunity, and litigation, rather than on resource restoration.

A legitimate fear for a PRP is inconsistency – a cleanup that must be partly undone to restore, or one that makes natural resource injury worse. Whether fair or unfair, there is a perception in the PRP community that the current NRDA regulations represent a kind of "second clean up." Occasionally, a second action or a lawsuit awaits the PRP who has neglected to assess and account for natural resource damages at a CERCLA site. Such a result, in practice, very rarely happens, but it remains a risk. The much more common peril is that an opportunity for efficiency and minimization of costs may be lost when the remedy is selected before and with little regard for restoration needs. Ideally, to maximize efficiencies and predictability, regulators would combine cleanup with restoration considerations – true integration of decision-making.

Benefits of Integrating NRDA and Response Action Selection Processes

Close coordination is possible if the key parties recognize the potential benefits of integration. Trustees frequently have expertise in environmental sciences and natural resources under their management that can be helpful to both the response agencies and the PRPs. Also, earlier incorporation and more accurate characterization of the potential natural resource risks into the response investigations will help avoid redundancies in the two processes. Among the PRP motivations for integrating restoration with response are defining and limiting work scope, reducing assessment costs and potential liabilities, and achieving more predictability earlier in the process.

A natural resource damage assessment can require a great deal of data, as does a response action. In many cases, much of those data could be collected during the response phase of a cleanup, when contractors and responders initially deploy on site and are mobilized for investigation. If data are needed for both response and natural resource damage assessment purposes, integration offers a chance to get all the data at once and avoids duplication of the efforts of the PRP and the trustees. Collection of data in one effort, and consensus on the type of data to be collected, lessens assessment costs for Trustees and, ultimately, the PRP. Because PRPs may only have to mobilize once and data are in a form usable by all parties, the additional cost to collect data for NRDA may only be greater than remedial data costs by a small increment. Collection of data all at once, according to agreed-upon methods, lessens the likelihood for data conflict and heightens confidence in the reliability of the data.

Coordination not only may eliminate duplication of efforts and costs during data collection efforts, but also may save time and money that would be spent pursuing a full natural resource damage assessment for residual damages. For example, natural resource risk information gained as a result of the ecological risk assessments performed for a remedial investigation / feasibility study (RI/FS), can provide source, transport/fate, and exposure information that will be needed for a preassessment screen, injury assessment, and restoration planning. Such coordination can also help avoid situations where the effects of the remedy may be more harmful to natural resources than leaving the contamination in place, and by preventing harm due to remedies planned without restoration in mind.

By considering NRD issues during response planning, residual damages may be reduced. For example, revegetation on caps and covers could be upgraded with native plants that provide superior habitat along with stabilization of cover material, or instead of using concrete-lined diversion ditches, other materials that might support macroinvertebrate communities could be used. The result may be more timely and complete correction of environmental harms (i.e., the injuries that give rise to both remedy and restoration), and avoidance or reduction of the need for additional restoration.

If trustees are included in the decisions about what remedial data to collect and decisions about remediation, the chances for an expedited settlement of natural resource

damages based on the information collected are heightened. It also makes it more likely that the parties can agree on the extent of injury and the scope of necessary restoration. Thus, cooperation and integration increases the chance for a restoration-based settlement. Integration can also avoid trustees coming into the remedial process late, possibly delaying settlement or placing a PRP in a position of having an unresolved liability.

Obstacles to Integration

There are obstacles to integration of response and restoration at sites where EPA (or a state) is the lead on response. First, there are real or perceived constraints on some federal agencies, e.g., DOE, DOD, to fund other trustees' activities. Such constraints sometimes prevent EPA and other Federal RPs from funding investigative work and restoration activities requested by trustees. Also, the response agencies have separate regulatory and legal authorities, which may not allow seamless interaction. There are generally a number of decision-makers on both the response agency and trustees sides, leading to a very complex, and often frustrating dynamic. Trustees tend not to have pre-existing budgets to use towards assessment as needed, while financial considerations may lead PRPs to reduce and/or defer expenditures for NRD work. The process of integrating response and restoration requires a partnership among the PRP, the response agency, and the trustees. Developing such a partnership requires certain skills and attitudes in a process that, historically, has been perceived as adversarial. Thus, lack of funding, confusion over similar but different regulatory missions, bureaucracy, concerns over legal authority, project managers' lack of experience, or simple personality conflicts, among many other potential difficulties, can pose challenges to parties attempting to integrate NRDAR into response programs.

DOE/DOD Policies on Integrating Response and Restoration

DOE and DOD have adopted policies encouraging such integration on sites where they are the lead response agency as well as a natural resource trustee. As background, the DOE/DOD experience can point to lessons that might be helpful throughout the cleanup/restoration world, because some of the obstacles that exist in the private sector are not present, or play out differently in the area of federal facility cleanup. Most importantly, since DOE/DOD are both cleanup managers and trustees they should not have to struggle to get trustee issues on the table, or reconcile disparate regulatory interpretations, or convince EPA or the state that it is in the cleanup agencies' best interest to integrate restoration and trustee considerations into the process. They can just do it. Also, these agencies have a statutory duty to conduct assessment and restoration, irrespective of the time constraints frequently imposed by statute of limitations on other federal and state trustees.

DOE has found that the most effective way to perform its dual natural resource trustee/CERCLA lead agency role is to proactively integrate natural resource trustee concerns with environmental restoration and waste management activities. The trustees at several DOE sites are represented on Trustee Councils or identified in site-specific Memoranda of Understanding (MOU). The natural resource trustees assist DOE's project

managers by contributing their technical expertise to site conceptual modeling and data quality objective development.

DOE's integration of natural resource trustee concerns into a remedial or removal action does not *per se* constitute "restoration." Because such actions are still response actions whose limited natural resource elements are designed to assesses risk, enhance environmental benefit or avoid environmental harm, they can be implemented with funding from the same environmental restoration project budget. For example, if a remedial action includes the digging out of "hot spots" of contamination, the subsequent refilling of those areas by inclusion of a surface water impoundment instead of clean fill, is part of the response action, not a separate restoration action, even though the new impoundments might create fish and wildlife habitat. Similarly, if the areas adjacent to the impoundments need regrading and revegetation, doing so in a manner that encourages the creation of wetlands where none previously existed, fulfills a remedial action purpose without having "restored" lost wetlands.

Recommendations for DOI

There is no regulatory or statutory prohibition against performing "integrated" response actions that address the concerns of the trustees and also take advantage of the work of on-scene responders. To the contrary, they encourage and even require such coordination,, especially early in the NRDA and at intermediate stages. However, DOI could take two actions to help foster the integrated approach to response and restoration: Guidance and regulatory revision.

Suggested New Guidance:

Guidance can help the NRD community to make early integration standard operating procedure. Therefore, the committee recommends guidance pointing trustees to the opportunity to influence remedies, accelerate restoration, and save money. Guidance could explicitly encourage trustees to work with PRPs and response agencies by highlighting existing opportunities for trustee involvement, such as the following rule sections.

> **Section 11.23 (PAS)**(f) Coordination. (1) In a situation where response activity is planned or underway at a particular site, assessment activity shall be coordinated with the lead agency consistent with the NCP.
> (2) Whenever, as part of a response action under the NCP, a preliminary assessment or an OSC Report is to be, or has been, prepared for the site, the authorized official should consult with the lead agency under the NCP, as necessary, and to the extent possible use information or materials gathered for the preliminary assessment or OSC Report, unless doing so would unnecessarily delay the preassessment screen.
> (3) Where a preliminary assessment or an OSC Report does not exist or does not contain the information described in this section, that additional information may be gathered. Trustees should coordinate such information gathering with the lead

agency to the extent practicable.
(4) If the natural resource trustee already has a process similar to the preassessment screen, and the requirements of the preassessment screen can be satisfied by that process, the processes may be combined to avoid duplication.

Recommended guidance to trustees and PRPs: to think ahead of the needs of the PAS phase to the response action planning process conducted by the responders. That process is an opportunity to perform early scoping of possible restoration assessment action. Coordination with the response authorities can lead to early trustee involvement in the response planning. Trustees can provide this input, for example, by offering expertise to identify natural resources at risk, perform conceptual modeling of the risk problem, and assisting in the development of data quality objectives used by EPA and other responders to plan data collection efforts. The results of ecological risk assessments or other similar preassessment screen processes used by other trustees could be considered by trustees in performing joint or unilateral preassessment screens.

Section 11.30 What does the authorized official do if an assessment is warranted?
(a) If the authorized official determines during the Preassessment Phase that an assessment is warranted, the authorized official must develop a plan for the assessment of natural resource damages, using existing data from any response action to the extent practicable.

Recommended guidance to trustees and PRPs: Coordination with the response authorities can lead to early trustee involvement in remedial data collection and feasibility planning. Trustees can provide this input, for example, by offering expertise to identify natural resources at risk, perform conceptual modeling of the risk problem, and assisting in the development of data quality objectives used by EPA and other responders to plan data collection efforts.

Section 11.31 (Assessment Plan).
(c)(3) The Assessment Plan shall contain information sufficient to demonstrate that the damage assessment has been coordinated to the extent possible with any remedial investigation feasibility study or other investigation performed pursuant to the NCP.

Recommended guidance to trustees and PRPs: Look to the on-going or completed ecological risk assessments performed as part of the Remedial Investigation conducted by the responders and the Feasibility Study wherein potential remedial alternatives are discussed. Trustees should be able to discern whether the response action risk assessments have provided sufficient data to feed into the information on natural resource damage assessment required for the Assessment Plan and whether it is possible to begin scoping possible restoration actions based upon the possible remedial actions.

Section 11.32 How does the authorized official develop the Assessment Plan?
(a) Pre-development requirements. The authorized official shall fulfill the following requirements before developing an Assessment Plan.
(1) Coordination ...

(a)(iv) The authorized official shall to the extent practicable coordinate with any response agencies and use existing remedial investigation data.

Recommended guidance to trustees and PRPs: Emphasize the opportunity presented and elaborate upon the kinds of coordination actions that trustees and response agencies have employed in the past. The results of exposure analysis and any modeling of contaminant fate and transport in the environment, plus identification of environmental receptors during the baseline risk assessments are examples of existing data gathered by the response agencies.

Section 11.37 Must the authorized official confirm exposure before implementing the Assessment Plan?
(b) Procedures. (1) Whenever possible, exposure shall be confirmed by using existing data, such as those collected for response actions by the OSC or Remedial Project Manager, or other available studies or surveys of the assessment area.

Recommended guidance to trustees and PRPs: Exposure is usually confirmed by preliminary or operational removal action or remedial investigations and through an RI/FS conducted by the responders. These processes present opportunities for the trustees to piggy-back on the responders' studies in order to obtain exposure data. Trustees might offer their expertise to identify the natural resource receptors at risk and receptors for which exposure sampling and analysis is needed.

Guidance should discuss how the response agency and trustees should work together during the RI/FS and ROD phases so that remedial actions and restoration can be incorporated together. Trustees and the PRPs should also work together when the RI/FS work plan is being prepared and on the ecological risk assessment. This coordination can result in a common data base, collective identification of data needs and data gaps, analysis of how the remedy will affect residual injury, how the remedy might be modified to lessen injury and residual damages, and early joint identification of possible restoration opportunities.

Guidance should discuss how the trustees could determine NRDA sampling and analysis requirements and use these to suggest or inform the development of data quality objectives (DQOs) for the response investigations; develop site conceptual models for risk and injury investigations with an eye toward identifying the natural resources at risk; use the response action results to suggest or inform new questions or assumptions regarding potential natural resource injuries and injury determinations, e.g., determine the potential for collateral ecological damage due to the proposed remedial actions; and begin restoration planning at the outset of a remedial project, keyed to a properly scoped response action work plan and relevant data collected by the on-scene responders (assisted by or in collaboration with the trustees and PRPs).

Guidance should encourage parties involved in an integrated assessment to consider developing written agreements that lay out the principles of how they will work together. Provisions can address decision making on types of studies and interpretation of data,

structure (such as technical working groups) that might be put into place for working together, roles and responsibilities of the parties, how agreements on injury and restoration will be memorialized, and how funding will be handled. These agreements can define the outcomes the parties are working towards. Such agreements help keep parties on track and moving forward, and signal the commitment of the parties to the process of working together.

Guidance should alert the parties that an integrated process will work best when the PRPs are actively engaged in the response actions. Participating PRPs are in a better position to plan for, collect, and integrate Assessment Plan information into their response actions. Trustees should make every practical attempt to engage with the PRPs and regulatory agencies before the remedy is decided.

Suggested Regulatory Changes

Notwithstanding the benefits to be gained through more detailed guidance, in order to facilitate a more rigorous integration of restoration and response, the subcommittee recommends that DOI consider revisions to several provisions of the Type B rule. As discussed above, there are opportunities for integration in at least the following areas: 1) identification and evaluation of natural resource risk and injury; 2) determination of the restoration work scope and development of a restoration plan; and 3) identification of actions needed to mitigate loss or injury to natural resources during the response action. In particular, if the planned remedy would itself cause collateral ecological injury, the trustees should be assured the chance for input before the final remedial decision.

In addition, the committee recommends adding a new provision, similar to the following, that would explicitly encourage trustees to pursue early coordination and integration of response and restoration processes with the goal of increasing efficiencies, minimizing assessment and restoration cost, and avoiding adverse environmental impact.

Coordination of damage assessment with response action investigations and planning.

i. Whenever practicable, prior to and during a remedial investigation or other investigation to support response action decisions, the affected trustee or trustees shall seek to coordinate with the lead response agency under the NCP to (1) minimize duplication of sampling and other data collection efforts between the response investigations and damages assessment, and (2) help ensure that, to the extent appropriate, data and other information collected for the response investigations will also be useful for injury determination and restoration planning;

ii. Where appropriate, the affected trustee or trustees may seek to coordinate with the lead response agency under the NCP concerning the selection of response and restoration actions to (1) minimize, or provide mitigation for, any potential

adverse impacts of the response actions on natural resources, (2) avoid inconsistency between response and restoration actions to the greatest extent possible, and (3) select the most cost-effective combination of response and restoration actions consistent with the requirements applicable to each decision. Such coordination may occur in any manner agreed by the lead response agency and the trustee or trustees and may include the issuance of a single, integrated decision document selecting both response and restoration actions.

By pursuing this approach with the lead response agency, the trustees and PRPs will be in a better position to reach a restoration-based settlement.

E. Should there be a preference for on-site or in-kind restoration (or any other preference among alternative strategies for restoration/replacement/acquisition)?

On-site, in-kind restoration often provides the most direct and reliable way to put the environment back to its baseline condition. However, direct on-site restoration may be impractical, and, in some situations, off-site restoration actions or actions that provide substitute resources may be more efficient and even, ultimately, more effective. For example, where a hazardous substance spill has killed a number of migratory birds, the optimal way to compensate for the loss (after preventing future exposure on-site) may be a project that preserves or upgrades nesting or feeding habitat in a different part of the affected birds' migratory range, instead of taking further action at or in the immediate vicinity of the site. Similarly, the removal of introduced predators on the breeding range of certain seabirds may promote recovery of the affected species by increasing the productivity of its breeding population, and may be more efficient than alternatives at the site of the injury.

Among the situations in which off-site restoration may be the better approach are where (a) residual on-site contamination (left in pace under an engineered cap or based on a balancing of costs and risks) limits the effectiveness of on-site restoration; (b) an off-site project could provide similar ecological benefits but superior human use benefits due to increased access or a more attractive location; or (c) the availability of other funding sources or synergies give trustees greater opportunities to "leverage" more restoration at an off-site location. Moreover, there are circumstances in which in-kind restoration may not provide as much benefit as an "out-of-kind" project. For example, a project to restore or protect riparian vegetation may provide more ecological services at no additional cost in comparison to "in-kind" restoration of injured upland vegetation. So long as the superior benefits of such projects are calculated to provide appropriate compensation for the injury, such projects should be encouraged or at least allowed under the regulations.

The existing Type B Rule, as affirmed by *Kennecott v. DOI*, provides flexibility to trustees so that they may be sensitive to the unique situation associated with each hazardous spill, including the option to consider off-site restoration projects or actions to provide substitute resources and services that may not be precisely the same as those that

were injured. The subcommittee believes it is important to preserve this flexibility and that a strict hierarchy of on-site versus off-site restoration actions might prevent trustees from selecting and implementing the alternative that best meets the criteria in §11.82(d) for evaluating alternatives. Therefore, the subcommittee recommends against giving on-site or in-kind alternatives a substantive preference or creating a hierarchy among different kinds of restoration actions.

At the same time, we believe that trustees should at least examine whether both an on-site/in-kind and an off-site restoration alternative would be appropriate in every case. Although the trustee(s) may conclude that any on-site alternative is unworkable or inferior in comparison to other options, requiring *consideration* of on-site and off-site restoration projects seems appropriate in all cases should not be unduly burdensome since the trustees will necessarily be examining conditions at the site anyway, and will help ensure that trustees do not settle on an alternative without fully considering different options. We recommend that DOI encourage consideration of such alternatives in every case through guidance rather than in regulatory text. Expanding the formal requirements of the rule in this manner would provide only minor benefits to the quality of trustee decision-making while adding a ground for challenging an otherwise sound restoration plan.

F. Is more guidance needed on the appropriateness of projects that provide "services" (such as recreation) without enhancing natural resources?

In addition to the revisions to existing selection factors discussed above, the subcommittee recommends that DOI develop and issue non-binding guidance on how trustees should evaluate several commonly-proposed "services restoration" projects.

Service "restoration" projects – particularly those that are intended to provide services to humans directly rather than through the enhancement or protection of natural resources, such as building recreational facilities – have caused controversy and raised questions about whether the proposed actions are consistent with the trustees' statutory mandate to restore, replace, or acquire the equivalent of the injured resources. Human service restoration projects include, for example, constructed recreational facilities. Although we believe the proposed revisions to the balancing factors will provide an improved framework for trustee decision-making, the subcommittee also believes that restoration selection could be streamlined and improved with the aid of a specific analytical framework that could be applied to alternatives such as research or educational programs and facilities; recreational amenities such as trails, cabins, restrooms, visitor centers, boat launches or piers, or parking facilities; and the stocking of sport fish to replace prior self-sustaining fisheries. Such a framework is best provided in guidance because of the difficulty in anticipating the myriad of issues and conditions that may arise at individual sites.

DOI should also address in guidance the problem of how to compensate for injuries to natural resources that are demonstrably of special cultural (including historical or religious) value to an Indian tribe or other citizens. Particularly when it is impossible,

or will take a long time, to return the injured resources fully to baseline, the impact on cultural uses may be large and cannot necessarily be remedied by providing substitute natural resources. The subcommittee therefore recommends that DOI discuss this problem in guidance and affirmatively recognize that projects providing cultural services may be appropriate where cultural uses are lost, even with a more attenuated link to natural resource enhancement or protection than would be appropriate in other circumstances.

Problems in evaluating projects to restore human services.

This issue arises where trustees pursue projects that would provide human use benefits directly as opposed to projects that would provide those benefits less directly through restored natural resources. Restoring services rather than natural resources is emphasized in such projects. The efforts might include making more resources available for human use or providing more people with opportunities to use existing resources. For example, a new fishing dock would allow more people to fish, and increasing fish stocks would make more fish available to people. Other examples within this category are boat ramps, trails, cabins, visitor centers, park facilities, environmental education facilities and programs, parking lots, stocked fishing ponds and aquaria. Concerns with projects of this nature center on two factors: the strength of the connection between the services they provide and the lost, injured, or destroyed natural resource; and the proportion of sums recovered that is committed to providing human services without an increase in ecological services – or even at the expense of ecological services.

"Sums recovered" under CERCLA for natural resource damages generally must be used to "restore, replace, or acquire the equivalent of" injured, lost or destroyed natural resources. 42 U.S.C. § 9607(f)(1). Under DOI's natural resource damages regulations, the lost services that the injured, lost, or destroyed natural resources would have provided are compensable:

> The measure of damages is the cost of restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured natural resources and the services those resources provide. Damages may also include, at the discretion of the authorized official, the compensable value of all or a portion of the services lost to the public for the *time period from the discharge or release until the attainment of the restoration, rehabilitation, replacement, and/or acquisition of equivalent of the resources and their services to baseline.*

43 C.F.R. § 11.80 (emphasis added). As indicated in the italicized language, compensation claims may include the period starting with the release and ending with the return of resources and services to baseline. The selection of restoration alternatives is limited, however, by factors the regulations require to be considered, including cost-effectiveness and the relationship between a project's cost and its expected benefits. 43 C.F.R. § 11.82(d).

Additionally, the DOI regulations permit trustees to consider alternatives that will return the natural resources and services to baseline as quickly as possible.

> The possible alternatives considered by the authorized official that return the injured resources and their lost services to baseline level could range from: *Intensive action on the part of the authorized official to return the various resources and services provided by those resources to baseline conditions as quickly as possible*; to natural recovery with minimal management actions. Possible alternatives within this range could reflect varying rates of recovery, combination of management actions, and needs for resource replacements or acquisitions.

43 C.F.R. § 11.82(c)(1)(emphasis added). Projects that directly provide human use benefits more rapidly than would resource restoration serve this section's purposes, but under CERCLA, must relate to restoring, replacing, or acquiring the equivalent of the natural resource.

It is also instructive to consider the OPA regulations that bear on this point.

> 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.*

15 C.F.R. § 990.10(emphasis added). Thus, direct restoration of human services is permissible under both the CERCLA and OPA regulations, so long as it consistent with the statutory requirement that NRD recoveries be used only to restore, replace, or acquire the equivalent of the injured resources.

Potential guidance on human services projects.

On the subject of "services projects," the full FACA Committee should recommend that DOI issue further non-binding guidance, in addition to the revisions to the Type B rule suggested above. Past disagreement among stakeholders and trustees indicate further guidance on the appropriateness of projects that provide "services" (such as recreation) without enhancing natural resources would be useful.

Guidance on the propriety of projects that directly provide human services could range from imposing limits on those projects, to expressly defining the strength of the connection needed between the project and the natural resource, to identifying specific

instances where such projects are appropriate. Each of the possibilities discussed below may be used individually or in combination.

> DOI guidance could suggest limits on how far trustees may stray from ecological restoration or enhancement when using sums recovered for lost human use services.

The new guidance could state that the *primary purpose of* restoration is to restore, enhance, or protect natural resources, while permitting human use projects if demonstrated to be appropriate under the site's circumstances. This approach would be consistent with the responsibilities of natural resource trusteeship while preserving the trustees' discretion and site-specific flexibility. Also, this approach is less likely than others to result in arbitrary decision-making. The flexibility and discretion preserved by this approach, however, leaves open the potential for outside influences on decision-makers. A difficulty also exists in identifying a standard applicable to all sites, *i.e.,* the standard required to justify departure from ecological restoration.

DOI guidance could also seek to strike a balance by *providing a preference* for ecosystem restoration while leaving open opportunities for human use projects. This approach also preserves the trustees' flexibility and discretion, and may not suffer from the potential for arbitrariness that might exist with other approaches. But, as with the first, the flexibility and discretion preserved by this approach leaves open the potential for outside influences on decision-makers.

Factors could be identified for trustees to consider when developing a human use project. Trustees pursuing an educational project, for example, could be required to show how human behavior affected by the project is connected to the natural resources, and the rationale underlying the identified connection. While this approach may not suffer from arbitrariness, it could result in unanticipated limitations of site-specific discretion and flexibility.

The guidance could suggest that trustees set out *proportions* (e.g., dollars or number of projects) for what percentage of projects would be focused on restoring natural resources and what proportion on restoring human use services. An advantage of this approach is it would retain some of the flexibility presently available in the regulations while at the same time limiting the exposure of trustees' decision-making to outside influences. On the other hand, it would be difficult to determine in a vacuum where the proportion/percentage line should be drawn since ecological and public interests, as well as the interests of diverse trustees, vary from one site to another. Accordingly, it may be most appropriate to permit decisions for use of sums recovered to be made on a case-by-case basis. Additionally, the broadly applicable limitations included in this approach may result in arbitrary decisions.

The guidance could articulate *outside bounds* of what can be done toward human use restoration. When compared to the previous approach, this one preserves greater flexibility and permits trustee representatives to exercise their expertise and knowledge of

site needs. Additionally, this approach may not risk arbitrary decisions. But this approach suffers the same difficulty as the previous, to a lesser degree, with respect to applying the same standard to all sites – in this instance, the boundaries imposed on enhancing human use.

Finally, consistent with the discussions of "nexus" above, the guidance could provide examples and explanation that would assist trustees in evaluating the *strength* of connection between the injured natural resources at issue and the human use enhancement being proposed.

Due to the various problems just discussed, the subcommittee does not recommend amending the DOI regulations or creating guidance to limit how far trustees can stray from ecological restoration or enhancement when using sums recovered from lost human use services.

> The Type B rule or DOI guidance should affirmatively recognize that a project providing cultural services (but not enhancing natural resources) is appropriate where cultural uses were lost.

Most commonly, cultural values are directly connected to natural resources where those resources are under the trusteeship of the states, the U.S. National Park Services (American culture) and Indian tribes (tribal-specific culture). Recognition in guidance that projects are appropriate when providing cultural services but not enhancing natural resources would foster trustee efforts to reinvigorate lost or diminished cultural values. For example, the long-term impacts of mining contamination on human resource use can extend for generations, resulting in the loss of connection to, and appreciation of, the affected resources. Those losses of connection and appreciation could be restored by educating member of the tribe and the public on the specific services the resources provided and their cultural values. Such education could occur at a tribal learning facility where the identification and uses of riparian plants for food, medicine, and clothing are demonstrated. Funding such a facility would be, we believe, appropriate. Consequently, the subcommittee recommends guidance be adopted to affirmatively recognize that cultural services projects are appropriate where cultural uses were lost, even when not enhancing natural resources, provided they relate to a reasonable degree to the lost resources and services.

G. Should DOI provide guidance on what constitutes a "reasonable number of possible alternatives" for trustees to consider before making a decision on a restoration plan?

No change to the rule is needed on this issue, but DOI guidance should clarify that "a reasonable number of possible alternatives" is not a fixed number but will vary depending on the nature of the injury and the location of the natural resources injured. Normally a reasonable range of alternatives should include at least one on-site alternative and at least one offsite alternative, as well as the "no action" alternative presently

required by the Type B rule. Where any of these types of restoration is not considered, the trustees should explain why that is.

It may seem intuitive that, in order to select the best restoration plan, the Trustees need to adequately examine the alternatives. It is possible that there may be only one way anyone may see to accomplish restoration or replacement; however, in that situation the Trustee will likely be faced with criticism for having insufficient imagination. More often, the issue for the Trustee will be a broad range of suggestions which, if all were to be comprehensively analyzed, would require an excessive amount of time and resources to accomplish. In that case, the trustee must narrow the number of alternatives to be given detailed analysis. Defining a number or even a specific numerical range that would constitute a "reasonable range of alternatives" is, in the view of our subcommittee, inappropriate if not impossible.

A number of recommendations of our subcommittee will have a limiting effect on the range of alternatives to be given a full detailed analysis. First, by identifying three specific criteria (reasonably likely to succeed, reasonably connected to the injury, and legal) among the existing list of criteria as threshold criteria, the range will be constrained. Secondly, encouraging an earlier focus on restoration will, we believe, generate more creative ideas unconstrained by remedial activities already in place.

Additionally, we believe that a possible shortage of ideas will be made less likely by encouraging two specific alternatives to be generated. It is incumbent upon the trustees to always consider the "no action" alternative. Frequently this is the natural attenuation approach. There may be a variety of reasons for a "no action" approach to be of interest to various interested entities. Regardless of how viable the "no action" alternative turns out to be, we believe it must be considered.

As discussed above, it is also important in our view that the Trustee makes a serious effort to consider at least one on-site restoration alternative and one off-site restoration alternative. We do not suggest that an on-site project must be selected over off-site projects; particularly where migratory wildlife is involved, it is easy to understand that off-site activity could be preferable. Among other potential situations in which on-site restoration would not be preferred are where residual on-site contamination might reduce benefits that would otherwise be provided by a project; where an off-site project could provide similar ecological benefits but superior human use benefits due to increased access or more attractive location; where Trustees may have greater opportunity to leverage more restoration at off-site locations. In-kind restoration may not always provide as much benefit as "out-of-kind" projects. So long as the superior benefits of such projects are calculated to provide fair offsets for potentially responsible parties' liability and debit, such projects should be considered under the regulations. Nevertheless, we do believe that, all things being equal (which we understand they never are), it is desirable to have on-site restoration.

In the end, we believe it is important that guidance encourage trustees to consider a range of alternatives that is reasonable for the incident of concern and the specific

natural resources injured. The range of restoration alternatives that will meet the threshold criteria as we have recommended them may vary greatly depending on the nature of the environment or habitat involved and the injuries suffered. In any case, among those alternatives that are reasonably likely to succeed, reasonably connected to the injury, and legal should be both a "no action" alternative and an on-site restoration alternative.

HShould there be a grossly dispropo rtionate to value'limitation on restoration projects?

We unanimously think the answer to this question should quite clearly be "no." For DOI to require a valuation analysis beyond the present requirement of § 11.82(d)(2) to *consider* "[t]he relationship of the expected costs of the proposed action to [its] expected benefits[,]" would not be helpful to any of the interested parties so long as there is no generally-accepted method of defining the value of the injured resources.

As noted above in the background discussion, the court challenge to § 11.82 of the DOI regulations included a request that DOI provide an exemption from restoration that is "grossly disproportionate" to the value of the injured resources. Also as noted, the court declined. *Kennecott v. DOI*, 88 F.3d at 1218.

The DOI regulations currently have two decision factors that address cost. Section 11.82(d)(2) requires a comparison of costs and benefits while § 11.82(d)(3) is a cost-effectiveness consideration. Cost-effectiveness is a comparative tool that helps one judge between or among alternatives. Insisting that the cost of the project be somehow "proportionate" to the value of the resources would be an amplification of the existing cost-benefit provision in that it is cost-benefit analysis that makes absolute, rather than comparative, judgments and can conclude that a project is or is not worth doing. On the other hand, cost effectiveness for purposes of § 11.82(d)(3) is defined in § 11.14(j) to mean "that when two or more activities provide the same or a similar level of benefits, the least costly activity providing that level of benefits will be selected."

We do not believe that there is any significant disagreement on the principle that money should not be wasted in the process of "restor[ing], replac[ing] or acquir[ing] the equivalent of" injured, lost, or destroyed natural resources. The issue is how one places an economic "dollars and cents" value on given resources. There have been significant levels of effort by academics and people in the public policy world to try to measure the value of injured resources in monetary terms. Every effort has been severely criticized by some significantly interested constituency. The litigation history is unhelpful. Imposing, the "grossly disproportionate" test would undermine restoration- based NRDA and force economic valuation of resources in every case – even though consensus has formed that such valuation is less likely to lead to prompt, amicable resolution of NRD claims.

III. Conclusion

The subcommittee generally supports a restoration selection approach that allows a large degree of discretion, and does not recommend a wholesale overhaul of existing regulations. However, a few targeted revisions to remedy-selection provisions is desirable. If DOI undertakes a rulemaking to incorporate threshold criteria, the subcommittee further suggests that other regulatory refinements to the existing selection factors should be adopted. The subcommittee also recommends a number of targeted revisions to the Rule to encourage an earlier focus on restoration alternatives. Lastly, the subcommittee believes guidance on a few specific issues could improve and accelerate trustee decision-making.

U.S. Department of the Interior

Natural Resource Damage Assessment and Restoration Advisory Committee

Final Report of Subcommittee 3 – Interim Losses

January 26, 2007

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Executive Summary:

The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and the Clean Water Act (CWA) authorize natural resource trustees to recover damages not only for the cost of restoring injured resources to the "baseline" condition that would have existed had the hazardous substance releases in question not occurred, but also for the loss of natural resource services that otherwise would have been provided to the public by the resources pending the re-establishment of baseline ("interim losses"). Under the existing CERCLA/CWA Natural Resource Damage Assessment and Restoration (NRDAR) regulations promulgated by the Department of the Interior (DOI), damages for interim losses are equal to the economic value the public loses until the baseline condition is re-established. The existing regulations call this "compensable value" (*See* 43 CFR 11.83(c)). CERCLA and the CWA require trustees to spend any compensable value recoveries to restore, replace, or acquire the equivalent of an injured natural resource.

In 1990, the NRDAR regulations under the Oil Pollution Act (OPA) required trustees to identify the restoration actions they intend to take to address interim losses before a demand is presented to potentially responsible parties. Damages for interim losses are then computed based on the cost of those actions, rather than on the monetary value of the interim losses. This promotes an early focus on feasible restoration rather than monetary damages, and can result in lower over-all restoration costs when high-value, cost-effective projects are utilized to address interim losses.

In 2005, DOI convened a NRDAR Federal Advisory Committee (NRDAR FACA Committee) to provide advice and recommendations on issues related to DOI's authorities, responsibilities, and activities under the natural resource damage provisions of CERCLA and the CWA. One of the questions posed to the NRDAR FACA Committee was whether DOI should revise the CERCLA NRDAR regulations to provide flexibility to compensate for interim losses through restoration actions that address those losses in lieu of the monetary value of the losses themselves -- as per the "restoration-based approach" outlined in the OPA NRDAR regulations. The question has arisen because some suggest that this alternative approach can promote more timely restoration, lower restoration costs, and avoid costly investigations and potential litigation concerning the complicated question of how to monetize lost services. Key issues include whether this flexibility to extend a "restoration-based approach" to calculating damages for interim losses is good public policy, and if so, whether it is necessary to amend the CERCLA NRDAR regulations to clearly permit it.

The Committee asked Subcommittee 3 to analyze these and related questions. After considering and discussing both the CERCLA and the OPA NRDAR regulations, numerous peer reviewed publications, judicial decisions, other materials which are made available as part of the record of the subcommittee's deliberations, and presentations by practitioners and tribal representatives, Subcommittee 3 members believe that the current regulations provide a useful framework for conducting natural resource damage assessments. Subcommittee 3 members also think that the full Committee should

consider a recommendation to DOI to clarify that it is appropriate to base the measure of interim loss damages on the cost of restoration projects that can provide services equivalent to those that have been lost, as an alternative to measuring interim losses by the monetary value of the lost services. All of the Subcommittee members agree that the flexibility to adopt a restoration-based approach on interim losses should not, however, modify the current CERCLA/CWA NRDAR regulation's focus on the concept of services (both human and ecological), baseline, causation and utilization of reliable assessment methodologies.

NRDAR FACA Committee Question #3:

Should DOI revise the CERCLA NRDAR regulations to permit flexibility to allow for compensating for interim losses with restoration projects in lieu of monetary damages for the value of the loss?

If so, how should project- based interim loss claims be calculated?

NRDAR FACA Question #3 Subcommittee Members:

Alex Beehler (alternate - Larry Groner), John Carlucci, Pat Casano, Barry Hartman, Nancy King, Jon Mueller, and Steve Polasky.

(Subcommittee 3 members have discussed and considered these questions in many telephone conferences and in the exchange of many draft papers. In addition, on June 5 and 6, 2006, the Subcommittee met at the National Conservation Training Center in Sheperdstown, West Virginia to discuss and analyze Question #3. Shannon Work, a FACA Committee member representing tribal interests participated in these meetings. Dr. William Desvousges, an economist, consultant, and NRDAR practitioner also participated in these meetings, as did Dr. Bruce Peacock, an economist and NRDAR practitioner from the National Park Service. The Subcommittee discussed and considered comments on drafts of this report at public meetings of the NRDAR FACA Committee on July 26-27 and November 29-30, 2006.

Analysis:

I. Should DOI revise the CERCLA NRDAR regulations to permit flexibility to allow for compensating for interim losses with restoration projects in lieu of monetary damages for the value of the loss?

Subcommittee 3 believes that the current regulations provide a good framework for conducting natural resource damage assessments. Subcommittee 3 members also think that the full Committee should consider a recommendation to DOI to clarify the appropriateness of compensating for interim losses with restoration projects that can provide services equivalent to those that have been lost, rather than requiring the monetary value of the lost services as the measure of damages

A. Primary Issues Considered:

1. What advantage is gained by using restoration actions to compensate for the interim loss of natural resource services rather than collecting the monetized economic value of those services as damages? What are the disadvantages to a restoration-based approach? What are the technical and cost considerations? Are there any legal impediments to use of a restoration-based approach?

a. Advantages of Using Restoration Actions to Compensate for Interim Loss:

- Better comports with CERCLA's overall restoration objectives.

- Promotes earlier focus on feasible restoration options to address natural resource injuries

- Allows flexibility to use simpler, cost-effective, and transparent methods in some cases.
    - Easier to explain to the public and other interested stakeholders how restoration projects compensate for interim losses than do monetary recoveries
    - Some restoration project-based analyses are easier to conduct and understand
    - Example: Easier to determine and explain enhanced fishing access as compensation for lost recreational fishing days than a monetary recovery

- Can encourage settlements by providing opportunities for more creative and/or cost effective restoration.

- Allows for the integration of CERCLA and OPA concepts of interim loss damages.

b. Disadvantages

- Some potentially responsible parties and economists believe that some restoration-based valuation methodologies – such as Habitat Equivalency Analysis (HEA), Resource Equivalency Analysis (REA), and Conjoint Analysis -- are not as reliable for determining interim losses as methodologies that measure and value the public's actual preferences regarding resource use and enjoyment. They note, for example, that HEA has been described in recent professional literature authored by some trustee representatives as a "developing" method (Cacela D., Lipton J., Beltman D., Hauser J., and Wolotira R., "Associating Ecosystem Service Losses With Indicators Of Toxicity In Habitat Equivalency Analysis," Env'l Management, Vol. 35, No. 3 (2005), p. 343), and that, to date, Conjoint Analysis has been used in relatively few damage assessments.

- HEA and REA are designed to measure ecological service losses and equivalents. They do not directly address the *value* of services provided to humans and thus, are not mentioned in the National Research Council's most recent report on *valuing* ecological services.

- Some potentially responsible parties and economists believe that since HEA and REA are unable to take into account the existence of available substitute resources, they can potentially bias damages estimates upward.

- Project-based approaches may not be appropriate to all situations. Accordingly, the option to quantify the monetary value of public interim losses should be retained.

c. Technical and Cost Considerations

- Monetary and project-based methodologies can have various technical and reliability issues that need to be considered. The existing CERCLA NRDAR regulations list specific methodologies that trustees may use when measuring the economic value of interim losses – including travel cost, hedonic pricing, and contingent valuation. As outlined below, the Subcommittee believes that the Committee should consider a recommendation that DOI not require or bar the use of any particular methodology – whether value- or project-based – and instead provide general technical and reliability factors to consider when selecting both a methodology and specific inputs for assessing interim losses. Illustrative examples of project-based and monetary loss value methodologies currently in use could, however, be helpful.

- Increased flexibility to select cost-effective methodologies or compensation options within the structured framework of the regulations could result in potential cost savings in some cases.

d. Legality of Restoration-Based Approach

- Under the current CERCLA NRDAR regulations, "compensable value" is the amount of money required to compensate the public for the [interim] loss in services provided by the injured resource." 40 CFR §11.83(c)(1). This definition encompasses the cost of a project to provide the equivalent of the lost services, and therefore appears to authorize the use of a restoration-based approach. Since the late 1990's, the restoration-based approach has been used to resolve claims arising from interim losses at a number of sites, including Lavaca Bay, Fox River, Saginaw River, and Grand Calumet River.

- The rule also provides, however, that "[c]ompensable value is measured by changes in consumer surplus, economic rent, and any fees or other payments collectable by a federal or State agency or an Indian tribe . . . and any economic rent accruing to a private party...." Id. Arguably, the cost of a restoration project is not a measure of a "change[] in consumer surplus", "economic rent", or "any fees or other payments collected by a federal or State agency or an Indian tribe." There is some concern that this provision could be read to preclude use of restoration-based approaches to resolve

claims for interim losses. There is no evidence, however, that anyone has objected to use of the restoration-based approach on this ground.

- Given that (1) the restoration-based approach is consistent with the statutory directive to use all recoveries to "restore, replace, or acquire the equivalent of" an injured natural resource; and (2) multiple claims for interim losses have been resolved using a restoration-based approach , without any serious objection to the use of that approach, the Subcommittee believes that there is little need to amend the rule to explicitly authorize the use of the restoration-based approach for interim losses. Should DOI determine, however, that an amendment is necessary for the sake of clarity, the Subcommittee recommends that DOI simply add a fourth sentence to the text of 43 CFR 11.83(c)(1) to read as follows [new text in boldface]:

  "Compensable value is measured by changes in consumer surplus, economic rent, and any fees or other payments collectable by a federal or State agency or an Indian tribe . . . and any economic rent accruing to a private party. . . . **Alternatively, compensable value can be measured by the funds necessary to implement a project or projects that cost effectively restores the lost services.**"

2. If the CERCLA NRD regulations are revised to permit project-based scaling for interim losses, is it helpful to include a hierarchy of project-based interim loss scaling (resource to resource, service to service, value to value, etc.) as provided in the OPA NRD regulations?

A rigid hierarchy of methodologies, as per the OPA NRDAR regulations, can sometimes undermine the benefits of a flexible approach to selecting methodologies. Additionally, a hierarchy of methodologies may not reflect the nature of the interim losses experienced at a site. For example, it may not be appropriate to use a "resource to resource" methodology that compensates for lost recreational fishing opportunities with increased fish populations (resources), but does not consider human access to those populations. Access may be an important component of the recreational service provided. A set of factors to consider, or guidelines for selecting methodologies, can help strike a balance between a mandatory hierarchy of methodologies and unfocused discretion.

3. If the CERCLA NRD regulations are revised to permit project-based compensation for interim losses, should they explicitly provide for opting out of project-based scaling, and utilizing the dollar value of the lost services (i.e., the current CERCLA regulation valuation) as the measure of damages, as the OPA NRD regulations provide? Should criteria for opting out be specified, or should there be maximum flexibility?

As discussed above, maximum flexibility is desirable. Accordingly, as per the OPA NRDAR regulations, trustees and potentially responsible parties should be able to use any appropriate methodologies – including project- or economic value loss-based.

B. Secondary Issues Considered:

1. Should interim losses in the CERCLA NRD regulations remain explicitly discretionary, or should they be treated as part of a unitary claim, as in the OPA NRD regulations?

The Subcommittee believes that there is no compelling reason to alter the explicitly discretionary nature of interim loss claims as set forth in the current CERCLA NRDAR regulations. This is consistent with CERCLA's emphasis on restoration as the central measure of damages, and can help to encourage settlement of claims in difficult cases.

2. Can the CERCLA NRD regulations provide any useful guidance on the relationship between the measure of damages specified in the regulations and the measure of interim loss damages in settlement and/or cooperative assessment contexts?

Project-based natural resource damage claims can support cooperative assessments and negotiated settlements. Early scoping of service losses and feasible, appropriate restoration opportunities can be particularly helpful. Currently, the CERCLA NRDAR regulations provide for an early scoping mechanism in a "rapid review of readily available information" before a formal assessment begins. This "Preassessment" phase (43 CFR 11.23-25) focuses on determining the hazardous substances released, the resources potentially at risk, and a preliminary estimate of the services provided by those resources. The Committee should consider a recommendation to DOI to provide guidance on expanding the scope of the Preassessment phase to include preliminary development of a range of service loss estimates and identification of feasible, appropriate restoration alternatives. Such guidance could help ensure that trustees conduct studies focused on restoration, and not just damages. This preliminary restoration scoping effort – focusing on feasible, appropriate on and off site restoration alternatives -- could be undertaken in a cooperative manner, even before injuries are quantified. Since the CERCLA NRDAR regulations do not require public release of Preassessment phase determinations until the conclusion of the assessment, cooperation during the Preassessment phase could form the basis for settlement discussions with potentially responsible parties to resolve natural resource damage claims. The current CERCLA NRDAR regulations specific endorsement of the use of a "process similar" to the described preassessment screen seems to underline the flexibility that DOI has to provide additional guidance to encourage utilizing the early phase of the NRDAR process to promote negotiated settlements and cost effective restoration of injured resources.

This preliminary restoration scoping should not normally include monetary damage estimates, to avoid raising issues related to securities laws on corporate liability accounting. In fact, the Committee should consider a recommendation to DOI to look closely at the Preassessment phase determinations in the current regulations – particularly those related to predictions about "the reasonable probability of a claim" – to see if similar concerns are implicated by that language. It should also be clear that preliminary

restoration alternative scoping does not replace actual restoration cost estimating or publicly reviewed restoration implementation planning (including publicly available information on objectives and monitoring of restoration success) after a claim is resolved.

3. Is it appropriate to have consistent nomenclature and definitions of categories of restoration and damages (e.g., baseline vs. primary restoration, compensable value vs. compensatory restoration, etc.) in the CERCLA and OPA NRD regulations?

Clarity is more important than consistency of nomenclature.

II. *If so, how should project-based interim loss compensation claims be calculated?*

While it may be helpful to mention certain restoration-action scaling methodologies for illustrative purposes –such as random utility models, habitat equivalency analysis, and conjoint analysis – the Subcommittee members believe that the CERCLA NRDAR regulation should not specifically sanction or bar the use of any particular methodology, but should instead provide factors to determine the utility and reliability of both methodologies and specific data inputs to those methodologies. That would help trustees to select for use methods that "are feasible and reliable for a particular incident and type of damage."

A. Primary Issues Considered:

1. Should interim loss claims value only lost services to humans, as the CERCLA NRD regulation currently provides, or should it also calculate the value of interim ecological service (or "environment") losses, without a requirement for a specific showing of a public nexus, as the OPA NRD rule provides?

The importance of natural resource services is not limited to human services. Subcommittee members believe that ecological service losses may provide a valid basis for determining interim loss compensation. However, some subcommittee members believe that there is no generally accepted method for valuing a service provided by a resource to another resource, and that such valuation is unnecessary, since baseline restoration is intended to restore the injured resources and the services that they provide to other resources.

2. Should the CERCLA NRD regulations specify suggested categories of interim losses for calculation?

DOI should consider developing guidance on the types of service losses likely to arise from, and reasonable to consider given a particular type of resource injury.

3. How reliable are available methodologies for valuing habitat or ecosystem service losses? Should the CERCLA NRD regulations specifically identify certain methodologies (such as Habitat or Resource Equivalency Analysis, Conjoint Analysis, etc.) as "best available procedures" for calculating interim loss damages? More generally, should the regulation specify criteria for evaluating methodologies to allow for the development of new assessment tools?

Some Subcommittee members are convinced that "revealed preference" methods, which utilize data on how people actually use and enjoy natural resources, are the most reliable methods for determining compensable values. These subcommittee members think that "stated preference" methods, such as Conjoint Analysis and Contingent Valuation, are not as reliable for a number of reasons, including the fact that they utilize survey responses to hypothetical situations. HEA and REA are neither revealed nor stated preference methods for measuring economic value; instead, HEA and REA estimate ecological service losses and compare them to service gains from restoration projects, without necessarily assigning a dollar value. HEA requires a proper metric for scaling service losses and gains; clearly articulated baseline conditions, and replacement resources that provide services of a type, quality, and quantity that are comparable to those lost. In addition, HEA does not consider the availability of substitute resources, which is critical to the assessment of the value of interim losses. Nevertheless, HEA and REA have been frequently utilized to compare resource units that produce equivalent flows of ecological services.

Given such issues, the Subcommittee agreed that DOI should not specifically sanction or bar the use of any particular methodology, but instead propose that the full Committee recommend that the DOI's regulations be amended, or that guidance be issued, to permit the use of any reliable methodology for calculating interim lost use values as set forth under subpart E of DOI's regulations. *See* 40 C.F.R.§11.83. This proposal would set forth general principles that all methodologies are expected to meet, while preserving those currently set forth in the regulations, and permitting the use of others.

The purpose of this recommendation is twofold. First, the recommendation is intended to provide for the use of alternative methods for determining lost use, and to recognize that some methods may not yet exist but may nonetheless be developed, and may be appropriate and reliable. Second the recommendation is intended to provide guidance to trustees and assurances to PRPs that a proposed method is reliable. As explained below, the subcommittee has not reached consensus on how best to achieve these goals: through amendments to the regulations, or through the use of guidance documents. These issues are discussed below as well.

This recommendation is not intended to require that interim lost use valuation methods proposed during settlement meet a specific standard. Rather, the purpose of this proposal is to provide guidance to the trustees on what indicia of objectivity and reliability should be met with respect to any proposed methodology prior to the initiation of settlement negotiations.

C. Illustrative Methodologies

1. Project-Based: Determines interim loss damages as the cost to implement restoration projects that provide services equivalent to those that have been lost

The advantage of project-based approaches is that they focus on restoration that replaces equivalent services without having to estimate the monetary value of lost services. The disadvantage of project-based approaches is that it may be difficult to ascertain whether equivalent services have been restored. The important concept here is that the restoration project provides equivalent ***services.*** It may not be enough to state that a project will restore equivalent acres of habitat because an acre of habitat in a different location may provide a different level of service. For example, restoring habitat that supports a fish or game species but does so in an area far from population centers that engage in recreational fishing or hunting will not deliver an equivalent recreational service compared to habitat that was injured close to population centers, although equivalent ecological services might have been restored.

HEA/REA: Calculates equivalent habitat or resource units but not equivalent human service units (as described above). As noted above, HEA requires a proper metric for scaling service losses/gains; clearly articulated baseline conditions, and replacement resources that provide services of a type, quality, and quantity that are comparable to those lost. In addition, HEA does not consider the availability of substitute resources. Standards for HEA inputs and calculations have been developed, utilized, and accepted by some Courts as reliable tools for the estimation of appropriate restoration to address natural resource injuries.

Random Utility Model: Can be used to compare projects on the basis of equivalent services provided. This method has been used extensively for recreational services. Use of the method is dependent on the existence or collection of adequate data on recreational (or other relevant) choices.

Conjoint Analysis: A stated preference method that compares projects on the basis of equivalent services provided. Method can be used for any type of damages. Survey questions can be designed to see whether people prefer the situation prior to injury or the situation with the restoration project. Stated preference methods are based on responses to hypothetical situations, rather than based on observed choices. Because studies have shown that responses to hypothetical questions do not always match actual behavior, there is debate over the reliability of stated preference methods.

2. Monetary-Based: Determines interim loss damages as the monetary value of lost services

Random Utility Model: Can be used to calculate the monetary values (willingness-to-pay) for lost services. This method is especially useful for recreational services. For example, the method has been used extensively to estimate the value of damage to recreational fishing sites. Use of the method is dependent on the existence or collection of adequate data on recreational (or other relevant) choices. An extensive body of peer-reviewed literature describes the elements and inputs to RUMs.

Contingent Valuation: A stated preference method that can estimate the willingness-to-pay for lost services. The advantage of the approach is that surveys can be tailored to the case at hand and can estimate values for which there is no observed behavior (e.g., existence values). Contingent valuation, however, has critics who doubt whether respondents can answer questions about willingness-to-pay in a reliable manner.

Conjoint Analysis: A stated preference method that can be used to estimate willingness-to-pay for lost services. Respondents are asked to make tradeoffs among the cost of restoration projects and other characteristics, which allows an estimate of the dollar value of damages or the value of various attributes of restoration. As noted above, there is debate over the reliability of stated preference methods.

Hedonic Method: This method typically uses evidence on residential properties to estimate the willingness-to-pay for environmental quality. For example, one can estimate the willingness-to-pay for water quality by comparing sales prices for houses located on lakes with different water quality while controlling for other relevant factors (e.g., house size, lot size, year of construction, etc.). Other applications of the hedonic method involve comparing wage differentials for jobs with different levels of risk. Application requires data on property sales (or employment) and can be difficult to use in sparsely populated areas or for services that do not directly affect property values (or wages).

Benefits Transfer: Uses information generated in other contexts to estimate willingness-to-pay in a particular case. The advantage of this approach is that it can be done relatively cheaply with pre-existing data if it is reliable. The disadvantage of this approach is that it introduces questions about the degree to which other contexts are appropriate for the circumstances of interest. To accurately measure values, the effect of differences in timing, location, or attributes of services must be adequately accounted for in the analysis.

Factor Income: Values resources by measuring its contribution to the value of production of a good or service. For example, if coastal wetlands provide nursery grounds for fish, the value of the wetland could be calculated as the change in

consumer and producer surplus attributable to the wetland. This methodology is also sometimes referred to as the production function approach, or valuing the environment as an input.

D. Regulation or Guidance

Although the Subcommittee provides suggested change to the regulations regarding the reliability of methodologies, in fact the Subcommittee did not reach consensus regarding whether DOI needs to undertake regulatory revision for this purpose, or if guidance is sufficient. The various positions that have been discussed are summarized below:

1. Amending regulations is a long, time consuming and challenging process, thus delaying the benefit that this proposal might have.

2. Amending regulations is an uncertain process; it could result in a final regulation that is far removed form the recommendation of the Committee.

3. This proposal is really an interpretation of a regulation and is therefore appropriate for guidance.

4. Regulations provide more certainty in that agency officials are required to follow them, whereas guidances are discretionary.

5. The current regulations specify certain methodologies already; amending them to also describe more generic criteria that would permit the use of other as yet unknown methodologies, is logical.

6. Guidance is nonbinding, thus providing greater flexibility to the trustees.

Is it appropriate to scale the value of interim loss projects that provide for additional natural resource services to the public (such as boat ramps or hiking trails) but do not directly restore, replace, or rehabilitate natural resources? Does CERCLA permit this type of compensation for interim losses?

CERCLA's restoration focus requires that all recoveries be used to restore, replace or acquire the equivalent of injured natural resources. CERCLA does not limit recoveries, however, to the cost of restoration – which allows for the collection of damages to compensate for interim losses. (CERCLA § 107(f)(1)). As practice under the OPA NRDAR Regulations has shown, sometimes projects that provide for human access, use, and enjoyment of resources more directly address certain categories of interim losses. Accordingly, given the similarity in requirements for the use of damages under both the CERCLA and the OPA statute (*See, e.g.,* CERCLA § 107(f)(1) and OPA § 006(f)), the Subcommittee believes that the Committee should recommend that DOI explicitly provide for the consideration of interim loss restoration actions that provide natural resource services to the public through access, use, and enjoyment opportunities, in addition to projects that address resource units, populations, or habitats. Factors to

consider in determining the appropriateness of such projects can include cost, the nexus to the loss, the nature of the benefits provided, and, most importantly, potential resource impacts of the project.

E. Secondary Issues:

1. What is the appropriate point in time for the initiation of interim loss calculations – From the date of the enactment of CERCLA? From the date of the release, if later, until restoration or replacement? From the date trustees notify PRPs of their intent to undertake and assessment, etc.? Should the rule discuss flexible approaches to setting this time period?

As previously set forth, The Subcommittee believes that the CERLCA NRDAR regulations should provide the maximum discretion to trustees on whether to seek interim loss damages at all, or in part. However, it might be helpful to clarify that interim loss damages cannot be calculated for losses occurring *before* the date of the enactment of CERCLA.

2. How specific and/or feasible do project-based interim losses compensation claims need to be? Are abstract units of habitat, such as "acre-years" sufficient, or should projects for scaling employ specific or generic project descriptions.

Projects to provide the equivalent of the interim lost services should be feasible and may be categorically described by service loss type and/or location. Restoration feasibility should be addressed early on in the process, in the preliminary scoping and assessment work plan.

Conclusion:

Our review and analysis of the CERCLA and OPA statutes and regulations, relevant literature, and more than twenty years of NRDAR practice, leads us to the conclusion that providing the flexibility to utilize restoration actions to address interim losses could encourage cooperative assessment and negotiated settlements that focus on restoration of public resources, rather than on monetary damages for harm. The Subcommittee members recommend that DOI clarify and encourage this flexibility.

References:

- CERCLA – 42 USC 9601, *et seq.*
- OPA – 33 USC 2701, *et seq.*
- CERCLA NRDAR Regulations – 43 CFR Part 11
- OPA NRDAR Regulations – 15 CFR Part 990
- *Ohio v. DOI,* 880 F2d, 432 (1989)
- *Kennecott v. DOI,* 88 F3rd 1191 (1996)
- *The Use of Habitat Equivalency Analysis in Natural Resource Damage Assessments* (Dunford, Ginn, and Desvousges, 2003)
- *Assessing Natural Resource Damages Using Environmental Annuities* (Unsworth and Bishop, 1993)
- *Exploring Welfare Implications of Resource Equivalency Analysis in Natural Resource Damage Assessments* (Zafonte and Hampton, 2006)
- *The Potential Role of Conjoint Analysis in Natural Resource Damage Assessments* (Matthews, Johnson, Dunford, and Desvousges)
- *Scaling Environmental Restoration to Offset Injury Using Habitat Equivalency Analysis* (Allen, Chapman, and Lane, 2005)
- *Valuing the Environment: Courts Struggle with Natural Resource Damages* Thompson, 2002)
- *Integrating Biology and Economics in Seagrass Restoration: How Much is Enough and Why* (Fonseca, Julius, and Kenworthy, 2000)
- *Quantifying Natural Resource Injuries and Ecological Service Reductions: Challenges and Opportunities* (Barnthouse and Stahl, 2002)
- *Response to DOI's Questions to FACA Subcommittee #3* (Desvousges and Michaels, 2006)
- *Twenty Years of Damage Assessments: What Have We Learned? Where Should DOI Go From Here?* (Power Point Presentation, Desvousges, 2006)
- *Interim Loss Damages: Project Based Approaches vs. Monetary Approaches* (Power Point Presentation, Peacock, 2006)

U.S. Department of the Interior

Natural Resource Damage Assessment and Restoration Advisory Committee

Final Report of Subcommittee 4

January 26, 2007

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EXECUTIVE SUMMARY

In 2005, DOI established a Federal Natural Resource Damage Assessment and Restoration Advisory Committee (Advisory Committee) to provide advice and recommendations on issues related to DOI's authorities, responsibilities, and activities under the natural resource damage provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Oil Pollution Act (OPA) and the Clean Water Act (CWA). Each Advisory Committee member was assigned by the Advisory Committee Chair to participate on one of four Subcommittees, and each Subcommittee was asked to make recommendations to the full Committee regarding one of four questions put before the Committee. The fourth question posed was:

> *What additional measures should DOI consider to expedite planning and implementation of restoration projects and to ensure effective and efficient restoration after awards or settlements are secured?*

The Subcommittee that was assigned this question participated in regularly scheduled conference calls (either biweekly or weekly) and came together for one face-to-face work session in Phoenix, Arizona. Members of the Subcommittee also received feedback from the full Advisory Committee on the Subcommittee's direction, ideas, and analysis during Advisory Committee meetings held in March, July, and November of 2006. After considering the before-mentioned statutes; the CERCLA and the OPA natural resource damage assessment and restoration regulations; relevant agency policies and directives; judicial decisions; academic journals; practitioner's notes and articles; feedback from the full Advisory Committee; presentations made by practitioners, tribal representatives, trustees, and members of the public at Advisory Committee meetings; members' own experiences with natural resource damage assessment and restoration; and other materials which are made available as part of the record of the Subcommittee's deliberations, the Subcommittee members have reached consensus on the following four recommendations to DOI related to the question presented:

1. **DOI Should Amend the CERCLA NRDA Regulations to Ensure that National Environmental Policy Act (NEPA) and Restoration Planning Processes are Fully Integrated.**

2. **DOI Should Develop Departmental Guidance To Address the Use of Pre-Existing Regional Resource Management Plans in Restoration Planning.**

3. **DOI Should Develop a Guidance-Based Initiative to Facilitate Cooperative Restoration.**

4. DOI Should Develop Guidance on Cooperative Assessment Which Includes, Among Other Items, Procedures to Maximize the Separation of the Scientific Assessment of Injury from the Development of Legal Positions of the Various Parties Involved in Assessment and Restoration Planning.

RECOMMENDATION I:

DOI Should Amend the CERCLA NRDA Regulations to Ensure that National Environmental Policy Act (NEPA) and Restoration Planning Processes are Fully Integrated.

I. Need for Change

The Subcommittee members agreed that the manner in which DOI complies with the requirements of the National Environmental Policy Act (NEPA) in restoration planning impacts significantly the efficiency and expediency of restoration planning and implementation efforts.

Currently, NEPA compliance is handled differently by different DOI agencies and further by different regions within the agencies. In some cases, NEPA analysis has taken place during restoration planning and is fairly integrated into the restoration planning process.[1] However, in other cases, agency restoration planning is followed by handoff of the restoration plan to a separate NEPA staff, which then undertakes a NEPA analysis. The latter process may result in significant and unnecessary delays in restoration implementation. The Subcommittee believes that there is a need for DOI to develop procedures that ensure that the fulfillment of NEPA requirements in restoration planning is handled efficiently.

II. Discussion

A. Background: The Requirements of NEPA

NEPA requires federal agencies, in a systematic fashion, to take environmental considerations into account in their decision-making, via the use of procedures which "encourage and facilitate public involvement in decisions which affect the quality of the human environment" and which "identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment."[2]

More specifically, agencies are required to prepare a detailed statement (EIS) on any proposal for a major federal action significantly affecting the quality of the human environment. An EIS should analyze five key issues: (1) the environmental impact of the proposed action; (2) any adverse environmental effects which cannot be avoided should the proposal be implemented; (3) alternatives to the proposed action; (4) the

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1 For example, restoration planning procedures for the Lower Fox River and Green Bay Area were integrated with NEPA analysis.

2 40 C.F.R. § 1500.2.

relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and (5) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

From a procedural standpoint, NEPA requires agencies to consult with and obtain the comments of other federal agencies with jurisdiction by law or special expertise with respect to any environmental impact involved. Agencies are also required to make copies of the statement, comments, and the views of federal, State, and local agencies authorized to develop and enforce environmental standards, available for review and comment by the President, the Council on Environmental Quality and the public. Generally, NEPA requires that the appropriate environmental information be made available to public officials and citizens "before decisions are made and before actions are taken."[3]

B. The Processes Required by NEPA and the CERCLA NRDA Regulations are Functionally Equivalent.

The Subcommittee members observed that many of the requirements of the CERCLA NRDA regulations and of NEPA are practically identical, so much so in fact that Subcommittee members came to the conclusion that a reasonable argument could be made that following the procedures contemplated by the NRDA regulations alone satisfies the key NEPA requirements such that separate NEPA analysis should not be required, pursuant to "functional equivalence" legal doctrine.

"Functional equivalence" doctrine in the NEPA context was expressed as follows in a leading case: "[W]here an agency is engaged primarily in an examination of environmental questions, where substantive and procedural standards ensure full and adequate consideration of environmental issues, then formal compliance with NEPA is not necessary, but functional compliance is sufficient."[4] In the past, some courts expressed a reluctance to extend the functional equivalence doctrine to agencies other than EPA.[5] More recently several courts have expressed a willingness to consider functional equivalence arguments posited by other agencies.[6]

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3 40 C.F.R. § 1500.1(b).

4 *Environmental Defense Fund v. United States Environmental Protection Agency*, 489 F.2d 1247, 1257 (D.C. Cir. 1973).

5 *See, e.g., Jones v. Gordon*, 621 F.Supp. 7, 13 (D. Alaska 1985), *aff'd in part, rev'd in part*, 792 F.2d 821 (9th Cir. 1986) (stating that the doctrine had to date been limited to the EPA, "whose sole responsibility is to protect the environment," and noting that "[t]he EIS exception found in this rule is extremely narrow and has no application in the NMFS, an agency with a far different mandate than the EPA"); *Texas Committee on Natural Resources v. Bergland*, 573 F.2d 201, 208 (5th Cir. 1978), *cert. denied*, 439 U.S. 966 (1978) (noting that the doctrine has "generally been limited to environmental agencies" and finding the Forest Service not to be one in the context of a timber management dispute because "[i]ts duties include both promotion of conservation of renewable timber resources and a duty to ensure that there is a sustained yield of those resource available" and "the Forest Service must balance environmental and economic needs in managing the nation's timber supply.")

The Subcommittee identified the development of the Restoration and Compensation Determination Plan (RCDP) required by the CERCLA NRDA regulations as the activity which generally fulfills NEPA's requirements. The RCDP is contemplated as part of the Assessment Plan in the regulations, though it may be released separately as long as it is subjected to the same scrutiny by interested Federal and State authorities, potentially responsible parties, and members of the public as is the Assessment Plan. The RCDP, comments on it received by the public and affected Federal and State agencies and Indian tribes, and responses to these comments are also included in the Report of Assessment. Under the CERCLA NRDA regulations, the Restoration Plan is developed based upon the RCDP.

The following figure compares the requirements of NEPA with the requirements of the CERCLA NRDA regulations:

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[6] *See, e.g., Fund for Animals v. Hall*, 448 F. Supp. 2d 127 (D. D.C. 2006) (noting that "an agency may be exempt from conducting a NEPA environmental review if a statute provides "procedurally and substantively" for the "functional equivalent" of compliance with NEPA and considering whether FWS's use of the Migratory Bird Hunting Frameworks and ESA Section 7 consultation requirements were the functional equivalent of a NEPA environmental review); *Cape Hatteras Access Pres. Alliance v. U.S. Dep't of Interior*, 344 F. Supp. 2d 108 (D. D.C. 2004) (noting that "[w]hen the government acts pursuant to a second statute, NEPA's [environmental impact] statement requirement must give way, under the law in this Circuit, . . . where the second statute ensures functional equivalence with NEPA (citing *EDF*), but noting that the agency did not pursue a functional equivalency argument in the matter); *Basel Action Network v. Maritime Admin.*, 285 F.Supp. 2d 58 (D.D.C. 2003) (finding that two reports to Congress issued by the Maritime Administration were the "functional equivalent" of supplemental EAs under NEPA and fulfilled NEPA requirements to prepare supplemental EAs for proposals at issue.); *Catron County Bd. Of Comm'rs v. United States Fish & Wildlife Serv.*, 75 F.3d 1429 (10th Cir. 1996) (noting that "NEPA compliance has . . . been excused by some courts where the particular action being undertaken is subject to rules and regulations that essentially duplicate the NEPA inquiry," though finding that functional equivalence did not apply with respect to designation of critical habitat under the ESA given the focus of the ESA, its legislative history, and its "cursory directive that the Secretary is to take into account "economic and other relevant impacts" of designation.").

There is also language in some of the earlier cases involving EPA that would support use of functional equivalence arguments by agencies other than EPA. *See, e.g., Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 380 (D.C. Cir. 1973) ("It is by no means clear . . . that NEPA's impact statement requirement was intended at time of passage of NEPA to be applicable to such environmental agencies as the National Air Pollution Control Administration of the Department of Health, Education and Welfare or the Federal Water Quality Administration of the Department of the Interior.")

NEPA/CEQ Regulations Require:	**CERCLA/NRDA Regulations Require:**
Unless a categorical exclusion applies or there is a Finding of No Significant Impact (FONSI) after Environmental Assessment (EA), detailed Environmental Impact Statement (EIS) covering:	Development of a Restoration and Compensation Determination Plan 43 CFR 11.80(c). Requirements include:
(1) Environmental impact of proposals for major federal action significantly affecting the quality of the human environment; (2) Any adverse environmental effects which cannot be avoided should the proposal be implemented; (3) Alternatives to the proposal, including a "no-action" alternative	The Restoration and Compensation Determination Plan "will list a reasonable number of possible alternatives for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources and the related services lost to the public associated with each; select one of the alternatives and the actions required to implement that alternative; give the rationale for selecting that alternative . . . ." 43 CFR § 11.81 (a) An alternative considering natural recovery with minimal management actions . . . shall be one of the possible alternatives considered. 43 CFR 11.82 (c)(2). When selecting the alternative to pursue, the authorized official shall evaluate each of the possible alternatives based on "all relevant considerations," including . . . the "expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources"; the "potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other resources . . . ." 43 CFR § 11.82(d)
(4) The relationship between the short-term uses of man's environment and the maintenance and enhancement of long-term productivity	In developing each of the possible alternatives, the authorized official shall list the proposed actions that would restore, rehabilitate, replace, and/or acquire the equivalent of the services provided by the injured natural resource that have been lost, and the period of time over which these services would continue to be lost." 43 CFR 11.82(b)(2)
(5) Any irreversible and irretrievable commitments of resources which would be involved in the proposal should it be implemented	See above § 11.82(d) factors, including requirements to consider "all relevant considerations" including "potential for . . . injury resulting from proposed actions, including long-term and indirect impacts, to the injured resource or other resources."
(6) Prior to making the statement, the responsible Federal official must consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved; (7) Copies of the statement and the comments and views of the appropriate Federal, State, and local agencies authorized to develop and enforce environmental standards must be made available to the President, the CEQ and to the public as provided by 5 USC § 552 and shall accompany the proposal through the existing agency review process. § 102	Development of Restoration and Compensation Determination Plan is required to involve identified PRPs, interested Federal and State agencies and Indian tribes, and the public, whether included as part of Assessment Plan or released separately. This includes consultation in development of draft Assessment Plan and review and comment of draft Plan and (or including) RCDP for at least 30 days, extensions granted as appropriate. 43 CFR §§ 11.31(c)(4); 11.32(c); 11.81(d)(2).

(8) NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. 40 CFR § 1500.1(b). The agency must invite the public to comment on draft statement. 40 CFR § 1503.1.	"Appropriate public review of the [RCDP] must be completed before the authorized official performs the methodologies listed in the Restoration and Compensation Determination Plan." 43 CFR § 11.81(d)(4). See also §§ 11.31(c)(4); 11.32(c); 11.81(d)(2), noted above. The Restoration Plan is developed based upon the Restoration and Compensation Determination Plan. Any significant modifications to the Restoration Plan must be made available for review by any responsible party, any affected natural resource trustees, other affected Federal or State agencies or Indian tribes, and any other interested members of the public for a period of at least 30 days, with reasonable extensions granted as appropriate, before tasks called for in the modified plan are begun. 43 CFR § 11.93

The Subcommittee believes that restoration planning conducted in accordance with the CERCLA NRDA regulations ensures full and adequate consideration of environmental issues, and involves sufficient safeguards to ensure the fulfillment of the purpose and policies behind NEPA. However, the Subcommittee chose not to recommend that DOI formally assert that restoration plans completed in accordance with the CERCLA NRDA regulations are the functional equivalent of NEPA analyses because the controversy which might follow such an assertion could be avoided by taking another approach.

C. Integration of NEPA and Restoration Planning Processes

The NEPA regulations require Federal agencies, "to the fullest extent possible," to integrate the requirements of NEPA with other planning, environmental review, and consultation requirements required by law or by agency practice "so that all such procedures run concurrently rather than consecutively."[7] This call for integration is repeatedly emphasized throughout the regulations.[8] Additionally, the NEPA regulations provide that "any document in compliance with NEPA may be combined with any other agency document to reduce duplication and paperwork."[9]

Since the requirements of the NRDA regulations substantially overlap with the requirements of NEPA, an option for streamlining NEPA processes in restoration planning and implementation would be to integrate NEPA requirements expressly into the restoration planning process such that completion of restoration planning pursuant to

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7 40 C.F.R. §§ 1500.2 (c).

8 *See e.g.*, 40 C.F.R. §§ 1500.4(k) (to promote paperwork reduction); 1500.5(a) and 1500.5(g) (to reduce delay); 1501.1(a); 1501.2; 1501.7(a)(6) (scoping); 1502.25(a) (environmental review and consultation requirements).

9 40 C.F.R. § 1506.4.

the requirements of the CERCLA NRDA regulations would also mean fulfillment of NEPA requirements. This alternative would probably be accomplished most effectively by amending the regulations in a manner similar to the way in which the National Oceanic and Atmospheric Administration (NOAA) developed the provisions of its Oil Pollution Act (OPA) NRDA regulations that cover NEPA compliance. The relevant provisions of the OPA regulations are reproduced below:

15 CFR § 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 available must be consistent with the federal trustee agency's NEPA requirements.
>
> (d) Relationship to Regional Restoration Plans or an existing restoration project. If a 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.

DOI should amend the CERCLA NRDA regulations in a similar fashion, so that draft restoration plans are developed consistent with DOI's NEPA regulations, and NEPA's consultation and public involvement procedures are fulfilled. Given the similarity between NEPA's requirements and the requirements of the CERCLA NRDA regulations, amending the CERCLA NRDA regulations in this manner should not prove unduly burdensome.

RECOMMENDATION II:

DOI Should Develop Departmental Guidance to Address the Use of Pre-Existing Regional Resource Management Plans in Restoration Planning.

I. Need for Change

CERCLA intends that restoration actions make the environment and public whole for natural resource and/or service injuries resulting from a release of a hazardous substance. Although the site-specific development of restoration plans is preferred for most cases, such site-specific plan development may be impractical and costly, or in some cases a regional perspective would be most beneficial for the resource at issue. If NRDA-specific regional restoration plans were available, they would be useful and helpful to reduce planning time and redundancy, but development of NRDA-specific regional restoration plans could be very time-consuming and expensive.

There are many regional-scale natural resource management planning documents already available which could be relevant for use in CERCLA restoration projects. Trustees should be encouraged to identify existing regional restoration plans or other existing restoration projects that may be relevant in a particular case. These plans or projects may be appropriate as long as natural resources and/or services comparable to those injured and expected to be restored are addressed in the plans.

II. Discussion

There are many resource management plans of regional scale which outline environmental quality concerns and causes, and which describe a preferred end-state for the environment. Many plans include outlines of specific resource management actions. Regional restoration plans are not just linked to one site or facility, they are large in scope and would possibly encompass vetted plans such as the North American Waterfowl Management Plan; National Fish Habitat Action Plans; the Great Lakes Regional Collaboration Strategy; a species recovery plan, state wildlife action plans, tribal resource management plans, etc. CERCLA settlement-specific restoration planning should include reviews of these regional plans in order to consider if the restoration projects, enabled by the settlement, could contribute to the goals of these various plans while also accomplishing the restoration goals envisioned in the CERCLA claim. Existing regional-scale management plans should be incorporated into CERCLA settlement restoration plans to the extent practicable so that the CERCLA restoration projects can take full advantage of the previous planning efforts, and thus achieve a higher degree of efficiency and relevance.

In 2004, the Program Manager for DOI's NRDAR Program issued Policies and Operating Principles for Natural Resource Restoration Activities, which stated:

> In an area where there have been multiple settlements for similar types of injury, or where such settlements are anticipated, a regional restoration plan may be developed and used as the basis for combining claims to maximize restoration success. An existing plan (e.g., regional, endangered species recovery, Coastal Zone Management, Tribal Resource Management Plan, etc.) or portions thereof, may be incorporated into a restoration plan.

Additionally, the DOI Restoration Program's draft "Restoration Handbook for the Natural Resource Damage Assessment and Restoration Program" (June, 2002), which was prepared by the Fish and Wildlife Service (FWS) on behalf of the National NRDA program discusses use of regional restoration plans, but this handbook has not been finalized or adopted by the Restoration Program, and so is used as a guide only, and is not viewed as definitive or as policy.

Section A.3.2 of the Draft Restoration Handbook, "Restoration Plans Based on Preexisting Plan" states, in reference to the NEPA requirements for restoration planning: "In situations where a regional or other (restoration) plan already exists and may have already undergone NEPA review, the RP [restoration plan] may extensively cite these pre-existing documents." The purpose of reliance on these preexisting plans is to add rigor to the NRDA planning process and to reduce redundancy.

Also, in Section H.3 "Regional Plans" the Draft Restoration Handbook provides:

> Natural resource trustees may consider using projects defined in existing regional RPs as described in OPA NRDA Rule . . . , or other planning documents when the impacts occurred in some geographically defined area. Trustees may also develop their own regional RPs. It is particularly beneficial to use new or existing plans in areas where a number of small damage recoveries, involving similar injuries, have accumulated or are likely to occur within an area . . . .
>
> These regional restoration plans are generally prepared based on watershed, bay complex, or landscape-defined boundaries. If the existing plans or projects have undergone environmental analyses (e.g., EIS, EA), trustees may tier restoration planning off the existing planning document. Benefits are further realized if design work and permit acquisition have already been completed. When a component of a regional restoration plan or other planning document is investigated as a restoration alternative, the same types of relationships to the natural resource injuries/losses the public may have suffered until the resources can be restored, and the scale of those injuries/losses, must be demonstrated in the restoration plan being

prepared, and necessary NEPA analyses must be done if not already completed.

Section H.3 of the Draft Restoration Handbook concludes "Benefits of using the results of existing planning efforts include the time and money saved by using past scoping efforts and public involvement, as well as completed environmental analyses (e.g., requirements of NEPA, if addressed) and increased opportunities for partnerships and broad support of restoration efforts. Existing regional or other plans can be extensively referenced and incorporated into the restoration plan to eliminate the need for repetition of effort. However, all public review and comment requirements of the restoration plan under development must still take place, restoration actions selected must have a relationship to the site/spill-specific injuries (if feasible), and new cost estimates must be developed."

In light of four years of experience gained by DOI, NOAA, other federal trustee agencies, and the States, the Draft Restoration Handbook should be reviewed and revised, then updated and released, with the realization that such documents can never be static. (If the Handbook is released as guidance, the Subcommittee recommends that the Handbook's discussion of NEPA be made generally consistent with the recommendation regarding streamlining fulfillment of NEPA requirements in restoration planning that is chosen by the Committee.)

The NOAA OPA regulations are potentially very relevant on the topic of regional restoration plans. The Draft Restoration Handbook cited above was written in consideration of the concepts introduced in the OPA regulations. Title 15, Code of Federal Regulations section 990.56 of the OPA regulations states that trustees may select all or part of an existing plan or project as the preferred alternative for restoration so long as the plan or project: (i) was developed with public review and comment or is subject to public review and comment; (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. DOI could amend the CERCLA NRDA regulations to include a similar provision. However, the Subcommittee observed that regional resource plans are currently being used in CERCLA restoration planning, so the Subcommittee is not certain that amending the regulations is necessary. The Subcommittee does see the need for additional guidance and encouragement of the use of such existing information.

FWS Region 3 provides an example of the use of regional restoration plans in NRD restoration planning. Region 3 has approximately 50 settlements and each has either a separate restoration plan, or uses a similar restoration plan to describe and justify selection of restoration projects. The restoration plans used in the Region consider the context of the restoration within otherwise non-NRDA specific regional natural resource management plans. Where regional plans exist, Region 3 tries to develop projects that are either called for by the larger plan, supportive of them, or otherwise consistent in focus. Some examples include:

1) Northwest Indiana Grand Calumet River/Indiana Harbor Canal: Numerous individual settlements have resulted in several restoration plans which are then used for other nearby, very similar cases, to identify, choose, and implement restoration projects. This was done to take advantage of pre-existing plans and to eliminate redundancy in planning.

2) Saginaw Bay/Saginaw River: Most, if not all, of the restoration projects enabled by this settlement were either listed in, or modeled after, activities called for by larger, more general greater-scale plans. Notable among these larger plans which were relied upon are: The North American Waterfowl Management Plan, the Saginaw Bay/River Remedial Action Plan, and the Saginaw Bay Watershed Initiative Network.

3) Fox River/Green Bay NRDA Restoration Plan: Because this NRDA encompassed a large area of assessment, the restoration is regional, or near-regional, in nature, and was developed in full consideration, with State and Tribal partners, of other regional natural resource management plans such as: The Remedial Action Plan for the Lower Fox River and Green Bay; the various coastal wetland management plans for Wisconsin, and the Wisconsin Land Legacy Report.

In using Regional Restoration Plans, DOI must ensure that the use of a regional restoration plan or other existing proposed restoration project does not violate the statutory requirement that natural resource damages must be used solely to restore, rehabilitate, replace, or acquire the equivalent of natural resources injured and services lost. The use of regional restoration plans or parts thereof which are focused on accomplishing other ends would be contrary to the requirements of CERCLA and the NRDA regulations.

Whether an existing plan or project represents appropriate restoration, rehabilitation, replacement, or acquisition of the equivalent injured or lost resources or services will depend on the nature of the site and the restoration plan or project. The use of possible restoration actions in an existing plan or project should be evaluated within the range of restoration alternatives that trustees are required to consider, including natural recovery. Regional restoration plans should be developed in such a way that trustees are able to justify linking the injuries from a particular case with a specific restoration project or set of projects within the plan. This may be facilitated by describing the types of anticipated injuries to specific natural resources within a region, and describing these injuries in terms of the types and importance of functions and services, ecological and human use.

The concept of using existing ("pre-existing") plans seems intuitively obvious. Pre-existing plans can range from simple databases of projects to complex, region-wide plans. Such plans can identify potential restoration projects, screen known potential restoration projects (perhaps even identify projects with various resource types), or develop potential projects through the engineering and design phase.

Some DOI agencies or agency regions are taking advantage of regional restoration plans, but DOI and other trustee agencies would benefit from more guidance and/or direction on the use of pre-existing regional restoration plans in CERCLA natural resource restoration planning, whether through amendment of the CERCLA NRDA regulations or through issuance of specific guidance on regional restoration planning, or both.

OPA Regulations on Regional Restoration Planning

15 CFR 990.15 Considerations to facilitate restoration.

> (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.

15 CFR 990.23 Compliance with NEPA and the CEQ regulations.

> (d) Relationship to Regional Restoration Plans or an existing restoration project. If a 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.

15 CFR 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.

RECOMMENDATION III:

DOI Should Develop a Guidance-Based Initiative to Facilitate Cooperative Restoration.

The current focus on cooperative conservation should be logically extended to NRDA restoration activities. DOI should establish a guidance-based initiative to increase opportunities for partnerships with states, tribal governments, non-profit organizations, land trusts, local governments and private entities, as appropriate, in the implementation of resource restoration actions. This might include establishing a clearinghouse for partnering opportunities within and outside of DOI which identifies and catalogues potential opportunities for partnering in restoration actions on a regional basis. This might be performed in conjunction with regional restoration planning efforts.

DOI should maximize opportunities to use restoration funds to leverage potential funding sources to implement appropriate restoration actions. The NRDAR program should establish and maintain close coordination and communication with other programs which administer funding programs for restoration projects, and where possible, establish a priority preference for NRDAR actions within the guidance for these programs. All available funding opportunities for NRDAR restoration actions should be identified and NRDAR program needs and goals should be effectively communicated within each of these funding programs. A routine training, notification and coordination process could be established between DOI cooperative programs and NRDAR staff. Where practical, NRDAR staff might be trained to draft successful funding proposals to facilitate winning restoration funds from external funding sources.

In circumstances where there is a state or tribal partner involved in an NRDAR recovery, the NRDAR funds should, whenever possible, be considered a legitimate non-federal match for the partnership funds. The contracting requirements and cooperative agreement processes used by the bureaus/DOI related to NRDAR should be streamlined and evaluated for opportunities to remove unnecessary administrative requirements.

DOI should work with other trustees to develop guidelines to use to solicit proposals from interested parties/public for appropriate NRDAR restoration actions in those situations where cash settlements have been secured and must be applied to an appropriate case-specific restoration action(s). This should include the identification of procedures and mechanisms that will ensure that the selection and funding of proposals will be consistent with the existing regulations under 43 CFR 11.82 (c) and (d) for selection of a preferred restoration alternative, and that will ensure that there is an appropriate nexus between the restoration action and the resource injury. Ideally, proposals received from a given solicitation, when combined with a "no-action" alternative, could constitute a "reasonable range of restoration alternatives". The process of soliciting proposals from the public should be robust, however it would not preclude the required public review and comment of restoration planning documents. In this

manner restoration planning documents and the effort to produce them could be streamlined, pulling virtually all needed information from the pool of projects received and the criteria under which they were evaluated.

DOI should encourage third party implementation of NRDAR restoration with focused DOI/Trustee oversight and management, to include implementation by responsible parties and non-profit conservation organizations. The Department should identify and remove/minimize restrictions and barriers which may prevent states, local governments, universities, non-profit organizations, and private sector entities from implementing NRDAR restoration. DOI should identify those circumstances under which it would allow its state and tribal co-trustee counterparts to assume direct responsibility for the contracting and implementation of NRDAR restoration actions.

To facilitate third party implementation of NRDAR restoration, DOI should develop practical and cost-effective procedures for oversight and management of restoration actions, to include reasonable and flexible monitoring protocols, performance criteria, thresholds for corrective actions and timelines for given types of restoration actions. These guidelines could be readily incorporated on a case-specific basis into requirements associated with funding of third party implemented restoration actions or into settlement documents of potentially responsible party implemented restoration.

Restoration planning should be initiated as early as possible, to include early public input and information exchange on potential restoration options. Aside from a given NRDA action, potential restoration actions should be identified and catalogued. This might include existing management plans for state and federal refuges and wildlife management areas, as well as local habitat/conservation plans. This might take the form of regional restoration plans, discussed in Recommendation II.

DOI should identify ways to reduce administrative burdens, streamline contracting requirements, limit or remove procedural obstacles and lower transaction costs in the implementation of restoration actions. A formal cooperative restoration initiative as described above could achieve many of these goals.

RECOMMENDATION IV:

DOI Should Develop Guidance on Cooperative Assessment Which Includes, Among Other Items, Procedures to Maximize the Separation of the Scientific Assessment of Injury from the Development of Legal Positions of the Various Parties Involved in Assessment and Restoration Planning.

I. Need for Change

The Subcommittee believes that ultimately, an efficient and effective cooperative assessment process has a substantial impact upon the efficiency and efficacy of restoration planning and implementation. Establishing cooperative assessment procedures that stakeholders can accept goes a long way toward a smooth transition to restoration planning and implementation.

In some cases under the NRDA regulations, there have been conflicts between the scientific assessment of injuries and remedies and prosecutorial and civil litigation processes. PRPs and Governments are caught between economic and political interests by the need and desire to protect their respective litigation positions. As a result, scientific assessments of harm may be done under a cloak of privilege that results in significant waste of resources, stilted results, bad decisions, and delay in restoration. DOI should develop strategies aimed at separating the questions of injury from the question of fault.

II. Discussion

The use of jointly acceptable science expertise may identify and assess concerns and remedies to be applied by all parties. Cooperative assessment among the Trustees and between Agencies could reduce costs, strengthen expertise, and reduce repetition and redundancy across sites. Transparent cooperative assessments should reduce the cost and time required for assessment and leave more available for remedies. Cooperative assessments could enhance the development of consensus in the selection of remedies and improve the cost effectiveness of the application of remediation funds to restoration.

That said, cooperative assessment may be perceived as running contrary to the natural political tendencies of the respective participants. The parties will need to develop confidence and trust of the other participants. The process also may be perceived as a reduction of individual agency authority or prerogative. Prosecutors or potential litigants might perceive a loss of advantage over their opponent. Finally, cooperative assessment means reduced opportunities for scientists or remediation specialists to participate on a site, with an attendant reduction in business opportunities.

All in all, however, the Subcommittee perceives the potential benefits of overcoming the current logjams as outweighing the negatives.

Developing strategies to separate questions of injury from the question of fault would decrease time for restoration implementation and prevent duplicative and conflicting scientific results. DOI should review existing cooperative assessment agreements that have been negotiated in some CERCLA and OPA NRD cases to see what has worked well and what has not, and should encourage increased use of appropriate agreements in the recommended guidance.[10]

[10] For example, see the Former Indian Refinery Natural Resource Damage Assessment Funding and Participation Agreement, which provides for the ability of the parties to develop approved Cooperative Studies, the results of which are binding in future judicial or administrative proceedings, and also allows parties to undertake Independent Studies, subject to certain advance notice requirements and the opportunity of other parties to invoke dispute resolution (and thus have the opportunity to try to come to agreement on an acceptable Cooperative Study instead) before Independent Studies may commence.

There are also several potentially helpful documents available for review on NOAA's Damage Assessment, Remediation and Restoration Program website, including NOAA's 2003 Cooperative Assessment Project (CAP) Framework and CAP Compendium of Additional Ideas and Example Documents. See http://www.darrp.noaa.gov/partner/cap/relate.html.

Appendix B

Bibliography: NRDAR Statutory Provisions

CERCLA NRDAR Regulations (43 CFR 11)

OPA NRDAR Regulations (15 CFR 990)

Other References

le 43--Public Lands: Interior

RT 11--NATURAL RESOURCE DAMAGE ASSESSMENTS

AUTHORITY: 42 U.S.C. 9651(c), as amended.

SOURCE: 51 FR 27725, Aug. 1, 1986, unless otherwise noted.

Subpart A—Introduction

§ 11.10 Scope and applicability.

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. 9601 *et seq.*, and the Clean Water Act (CWA), 33 U.S.C. 1251–1376, provide that natural resource trustees may assess damages to natural resources resulting from a discharge of oil or a release of a hazardous substance covered under CERCLA or the CWA and may seek to recover those damages. This

part supplements the procedures established under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR part 300, for the identification, investigation, study, and response to a discharge of oil or release of a hazardous substance, and it provides a procedure by which a natural resource trustee can determine compensation for injuries to natural resources that have not been nor are expected to be addressed by response actions conducted pursuant to the NCP. The assessment procedures set forth in this part are not mandatory. However, they must be used by Federal or State natural resource trustees in order to obtain the rebuttable presumption contained in section 107(f)(2)(C) of CERCLA. This part applies to assessments initiated after the effective date of this final rule.

[53 FR 5171, Feb. 22, 1988]

§ 11.11 Purpose.

The purpose of this part is to provide standardized and cost-effective procedures for assessing natural resource damages. The results of an assessment performed by a Federal or State natural resource trustee according to these procedures shall be accorded the evidentiary status of a rebuttable presumption as provided in section 107(f)(2)(C) of CERCLA.

[53 FR 5171, Feb. 22, 1988]

§ 11.12 Biennial review of regulations.

The regulations and procedures included within this part shall be reviewed and revised as appropriate 2 years from the effective date of these rules and every second anniversary thereafter.

§ 11.13 Overview.

(a) *Purpose.* The process established by this part uses a planned and phased approach to the assessment of natural resource damages. This approach is designed to ensure that all procedures used in an assessment, performed pursuant to this part, are appropriate, necessary, and sufficient to assess damages for injuries to natural resources.

(b) *Preassessment phase.* Subpart B of this part, the preassessment phase, provides for notification, coordination, and emergency activities, if necessary, and includes the preassessment screen. The preassessment screen is meant to be a rapid review of readily available information that allows the authorized official to make an early decision on whether a natural resource damage assessment can and should be performed.

(c) *Assessment Plan phase.* If the authorized official decides to perform an assessment, an Assessment Plan, as described in subpart C of this part, is prepared. The Assessment Plan ensures that the assessment is performed in a planned and systematic manner and that the methodologies chosen demonstrate reasonable cost.

(d) *Type A assessments.* The simplified assessments provided for in section 301(c)(2)(A) of CERCLA are performed using the standard procedures specified in subpart D of this part.

(e) *Type B assessments.* Subpart E of this part covers the assessments provided for in section 301(c)(2)(B) of CERCLA. The process for implementing type B assessments has been divided into the following three phases.

(1) *Injury Determination phase.* The purpose of this phase is to establish that one or more natural resources have been injured as a result of the discharge of oil or release of a hazardous substance. The sections of subpart E comprising the Injury Determination phase include definitions of injury, guidance on determining pathways, and testing and sampling methods. These methods are to be used to determine both the pathways through which resources have been exposed to oil or a hazardous substance and the nature of the injury.

(2) *Quantification phase.* The purpose of this phase is to establish the extent of the injury to the resource in terms of the loss of services that the injured resource would have provided had the discharge or release not occurred. The sections of subpart E comprising the Quantification phase include methods for establishing baseline conditions, estimating recovery periods, and measuring the degree of service reduction stemming from an injury to a natural resource.

(3) *Damage Determination phase.* The purpose of this phase is to establish the appropriate compensation expressed as

a dollar amount for the injuries established in the Injury Determination phase and measured in the Quantification phase. The sections of subpart E of this part comprising the Damage Determination phase include guidance on acceptable cost estimating and valuation methodologies for determining compensation based on the costs of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources, plus, at the discretion of the authorized official, compensable value, as defined in § 11.83(c) of this part.

(f) *Post-assessment phase.* Subpart F of this part includes requirements to be met after the assessment is complete. The Report of Assessment contains the results of the assessment, and documents that the assessment has been carried out according to this rule. Other post-assessment requirements delineate the manner in which the demand for a sum certain shall be presented to a responsible party and the steps to be taken when sums are awarded as damages.

[51 FR 27725, Aug. 1, 1986, as amended at 59 FR 14281, Mar. 25, 1994]

§ 11.14 Definitions.

Terms not defined in this section have the meaning given by CERCLA or the CWA. As used in this part, the phrase:

(a) *Acquisition of the equivalent* or *replacement* means the substitution for an injured resource with a resource that provides the same or substantially similar services, when such substitutions are in addition to any substitutions made or anticipated as part of response actions and when such substitutions exceed the level of response actions determined appropriate to the site pursuant to the NCP.

(b) *Air* or *air resources* means those naturally occurring constituents of the atmosphere, including those gases essential for human, plant, and animal life.

(c) *Assessment area* means the area or areas within which natural resources have been affected directly or indirectly by the discharge of oil or release of a hazardous substance and that serves as the geographic basis for the injury assessment.

(d) *Authorized official* means the Federal or State official to whom is delegated the authority to act on behalf of the Federal or State agency designated as trustee, or an official designated by an Indian tribe, pursuant to section 126(d) of CERCLA, to perform a natural resource damage assessment. As used in this part, authorized official is equivalent to the phrase "authorized official or lead authorized official," as appropriate.

(e) *Baseline* means the condition or conditions that would have existed at the assessment area had the discharge of oil or release of the hazardous substance under investigation not occurred.

(f) *Biological resources* means those natural resources referred to in section 101(16) of CERCLA as fish and wildlife and other biota. Fish and wildlife include marine and freshwater aquatic and terrestrial species; game, nongame, and commercial species; and threatened, endangered, and State sensitive species. Other biota encompass shellfish, terrestrial and aquatic plants, and other living organisms not otherwise listed in this definition.

(g) *CERCLA* means the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601 *et seq.*, as amended.

(h) *Committed use* means either: a current public use; or a planned public use of a natural resource for which there is a documented legal, administrative, budgetary, or financial commitment established before the discharge of oil or release of a hazardous substance is detected.

(i) *Control area* or *control resource* means an area or resource unaffected by the discharge of oil or release of the hazardous substance under investigation. A control area or resource is selected for its comparability to the assessment area or resource and may be used for establishing the baseline condition and for comparison to injured resources.

(j) *Cost-effective* or *cost-effectiveness* means that when two or more activities provide the same or a similar level of benefits, the least costly activity providing that level of benefits will be selected.

(k) *CWA* means the Clean Water Act, as amended, 33 U.S.C. 1251 *et seq.*, also referred to as the Federal Water Pollution Control Act.

(l) *Damages* means the amount of money sought by the natural resource trustee as compensation for injury, destruction, or loss of natural resources as set forth in section 107(a) or 111(b) of CERCLA.

(m) *Destruction* means the total and irreversible loss of a natural resource.

(n) *Discharge* means a discharge of oil as defined in section 311(a)(2) of the CWA, as amended, and includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil.

(o) *Drinking water supply* means any raw or finished water source that is or may be used by a public water system, as defined in the SDWA, or as drinking water by one or more individuals.

(p) *EPA* means the U.S. Environmental Protection Agency.

(q) *Exposed to* or *exposure of* means that all or part of a natural resource is, or has been, in physical contact with oil or a hazardous substance, or with media containing oil or a hazardous substance.

(r) *Fund* means the Hazardous Substance Superfund established by section 517 of the Superfund Amendments and Reauthorization Act of 1986.

(s) *Geologic resources* means those elements of the Earth's crust such as soils, sediments, rocks, and minerals, including petroleum and natural gas, that are not included in the definitions of ground and surface water resources.

(t) *Ground water resources* means water in a saturated zone or stratum beneath the surface of land or water and the rocks or sediments through which ground water moves. It includes ground water resources that meet the definition of drinking water supplies.

(u) *Hazardous substance* means a hazardous substance as defined in section 101(14) of CERCLA.

(v) *Injury* means a measurable adverse change, either long- or short-term, in the chemical or physical quality or the viability of a natural resource resulting either directly or indirectly from exposure to a discharge of oil or release of a hazardous substance, or exposure to a product of reactions resulting from the discharge of oil or release of a hazardous substance. As used in this part, injury encompasses the phrases "injury," "destruction," and "loss." Injury definitions applicable to specific resources are provided in § 11.62 of this part.

(w) *Lead authorized official* means a Federal or State official authorized to act on behalf of all affected Federal or State agencies acting as trustees where there are multiple agencies, or an official designated by multiple tribes where there are multiple tribes, affected because of coexisting or contiguous natural resources or concurrent jurisdiction.

(x) *Loss* means a measurable adverse reduction of a chemical or physical quality or viability of a natural resource.

(y) *Natural Contingency Plan* or *NCP* means the National Oil and Hazardous Substances Contingency Plan and revisions promulgated by EPA, pursuant to section 105 of CERCLA and codified in 40 CFR part 300.

(z) *Natural resources* or *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 fishery conservation zone established by the Magnuson Fishery Conservation and Management Act of 1976), any State or local government, any foreign government, any Indian tribe, or, if such resources are subject to a trust restriction on alienation, any member of an Indian tribe. These natural resources have been categorized into the following five groups: Surface water resources, ground water resources, air resources, geologic resources, and biological resources.

(aa) *Natural resource damage assessment* or *assessment* means the process of collecting, compiling, and analyzing information, statistics, or data through prescribed methodologies to determine damages for injuries to natural resources as set forth in this part.

(bb) *Oil* means oil as defined in section 311(a)(1) of the CWA, as amended, 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.

(cc) *On-Scene Coordinator* or *OSC* means the On-Scene Coordinator as defined in the NCP.

(dd) *Pathway* means the route or medium through which oil or a hazardous substance is or was transported from the source of the discharge or release to the injured resource.

(ee) *Reasonable cost* means the amount that may be recovered for the cost of performing a damage assessment. Costs are reasonable when: the Injury Determination, Quantification, and Damage Determination phases have a well-defined relationship to one another and are coordinated; the anticipated increment of extra benefits in terms of the precision or accuracy of estimates obtained by using a more costly injury, quantification, or damage determination methodology are greater than the anticipated increment of extra costs of that methodology; and the anticipated cost of the assessment is expected to be less than the anticipated damage amount determined in the Injury, Quantification, and Damage Determination phases.

(ff) *Rebuttable presumption* means the procedural device provided by section 107(f)(2)(C) of CERCLA describing the evidentiary weight that must be given to any determination or assessment of damages in any administrative or judicial proceeding under CERCLA or section 311 of the CWA made by a Federal or State natural resource trustee in accordance with the rule provided in this part.

(gg) *Recovery period* means either the longest length of time required to return the services of the injured resource to their baseline condition, or a lesser period of time selected by the authorized official and documented in the Assessment Plan.

(hh) *Release* means a release of a hazardous substance as defined in section 101(22) of CERCLA.

(ii) *Replacement* or *acquisition of the equivalent* means the substitution for an injured resource with a resource that provides the same or substantially similar services, when such substitutions are in addition to any substitutions made or anticipated as part of response actions and when such substitutions exceed the level of response actions determined appropriate to the site pursuant to the NCP.

(jj) *Response* means remove, removal, remedy, or remedial actions as those phrases are defined in sections 101(23) and 101(24) of CERCLA.

(kk) *Responsible party or parties* and *potentially responsible party or parties* means a person or persons described in or potentially described in one or more of the categories set forth in section 107(a) of CERCLA.

(ll) *Restoration* or *rehabilitation* means actions undertaken to return an injured resource to its baseline condition, as measured in terms of the injured resource's physical, chemical, or biological properties or the services it previously provided, when such actions are in addition to response actions completed or anticipated, and when such actions exceed the level of response actions determined appropriate to the site pursuant to the NCP.

(mm) *SDWA* means the Safe Drinking Water Act, 42 U.S.C. 300f–300j–10.

(nn) *Services* means the physical and biological functions performed by the resource including the human uses of those functions. These services are the result of the physical, chemical, or biological quality of the resource.

(oo) *Site* means an area or location, for purposes of response actions under the NCP, at which oil or hazardous substances have been stored, treated, discharged, released, disposed, placed, or otherwise came to be located.

(pp) *Surface water resources* means the waters of the United States, including the sediments suspended in water or lying on the bank, bed, or shoreline and sediments in or transported through coastal and marine areas. This term does not include ground water or water or sediments in ponds, lakes, or reserviors designed for waste treatment under the Resource Conservation and Recovery Act of 1976 (RCRA), 42 U.S.C. 6901–6987 or the CWA, and applicable regulations.

(qq) *Technical feasibility* or *technically feasible* means that the technology and management skills necessary to implement an Assessment Plan or Restoration and Compensation Determination Plan are well known and that each element of the plan has a reasonable

chance of successful completion in an acceptable period of time.

(rr) *Trustee* or *natural resource trustee* means any Federal natural resources management agency designated in the NCP and any State agency designated by the Governor of each State, pursuant to section 107(f)(2)(B) of CERCLA, that may prosecute claims for damages under section 107(f) or 111(b) of CERCLA; or an Indian tribe, that may commence an action under section 126(d) of CERCLA.

(ss) *Type A assessment* means standard procedures for simplified assessments requiring minimal field observation to determine damages as specified in section 301(c)(2)(A) of CERCLA.

(tt) *Type B assessment* means alternative methodologies for conducting assessments in individual cases to determine the type and extent of short- and long-term injury and damages, as specified in section 301(c)(2)(B) of CERCLA.

(uu) *Indian tribe* means any Indian tribe, band, nation, or other organized group or community, including any Alaska Native village 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.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5171, Feb. 22, 1988; 59 FR 14281, Mar. 25, 1994]

§ 11.15 What damages may a trustee recover?

(a) In an action filed pursuant to section 107(f) or 126(d) of CERCLA, or sections 311(f) (4) and (5) of the CWA, a natural resource trustee who has performed an assessment in accordance with this rule may recover:

(1) Damages as determined in accordance with this part and calculated based on injuries occurring from the onset of the release through the recovery period, less any mitigation of those injuries by response actions taken or anticipated, plus any increase in injuries that are reasonably unavoidable as a result of response actions taken or anticipated;

(2) The costs of emergency restoration efforts under § 11.21 of this part;

(3) The reasonable and necessary costs of the assessment, to include:

(i) The cost of performing the preassessment and Assessment Plan phases and the methodologies provided in subpart D or E of this part; and

(ii) Administrative costs and expenses necessary for, and incidental to, the assessment, assessment planning, and restoration, rehabilitation, replacement, and/or acquisition of equivalent resources planning, and any restoration, rehabilitation, replacement, and/or acquisition of equivalent resources undertaken; and

(4) Interest on the amounts recoverable as set forth in section 107(a) of CERCLA. The rate of interest on the outstanding amount of the claim shall be the same rate as is specified for interest on investments of the Hazardous Substance Superfund established under subchapter A of chapter 98 of the Internal Revenue Code of 1954. Such interest shall accrue from the later of: The date payment of a specified amount is demanded in writing, or the date of the expenditure concerned;

(b) The determination of the damage amount shall consider any applicable limitations provided for in section 107(c) of CERCLA.

(c) Where an assessment determines that there is, in fact, no injury, as defined in § 11.62 of this part, the natural resource trustee may not recover assessment costs.

(d) There shall be no double recovery under this rule for damages or for assessment costs, that is, damages or assessment costs may only be recovered once, for the same discharge or release and natural resource, as set forth in section 107(f)(1) of CERCLA.

(e) Actions for damages and assessment costs shall comply with the statute of limitations set forth in section 113(g), or, where applicable, section 126(d) of CERCLA.

[51 FR 27725, Aug. 1, 1986, as amended at 52 FR 9095, Mar. 20, 1987; 53 FR 5172, Feb. 22, 1988; 59 FR 14281, Mar. 25, 1994; 61 FR 20609, May 7, 1996]

§ 11.16 [Reserved]

§ 11.17 Compliance with applicable laws and standards.

(a) *Worker health and safety.* All worker health and safety considerations specified in the NCP shall be observed, except that requirements applying to response actions shall be taken to apply to the assessment process.

(b) *Resource protection.* Before taking any actions under this part, particularly before taking samples or making determinations of restoration or replacement, compliance is required with any applicable statutory consultation or review requirements, such as the Endangered Species Act; the Migratory Bird Treaty Act; the Marine Protection, Research, and Sanctuaries Act; and the Marine Mammal Protection Act, that may govern the taking of samples or in other ways restrict alternative management actions.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5172, Feb. 22, 1988]

§ 11.18 Incorporation by reference.

(a) The following publications or portions of publications are incorporated by reference:

(1) Part II only (Fish-Kill Counting Guidelines) of "Monetary Values of Freshwater Fish and Fish-Kill Guidelines," American Fisheries Society Special Publication Number 13, 1982; available for purchase from the American Fisheries Society, 5410 Grosvenor Lane, Bethesda, MD 20814, ph: (301) 897–8616. Reference is made to this publication in §§ 11.62(f)(4)(i)(B) and 11.71(l)(5)(iii)(A) of this part.

(2) Appendix 1 (Travel Cost Method), Appendix 2 (Contingent Valuation (Survey) Methods), and Appendix 3 (Unit Day Value Method) only of Section VIII of "National Economic Development (NED) Benefit Evaluation Procedures" (Procedures), which is Chapter II of *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies,* U.S. Department of the Interior, Water Resources Council, Washington, DC, 1984, DOI/WRC/–84/01; available for purchase from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161; PB No. 84–199–405; ph: (703) 487–4650. Reference is made to this publication in § 11.83(a)(3) of this part.

(3) "Uniform Appraisal Standards for Federal Land Acquisition" (Uniform Appraisal Standards), Interagency Land Acquisition Conference, Washington, DC, 1973; available for purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; Stock Number 052–059–00002–0; ph: (202) 783–3238. Reference is made to this publication in § 11.83(c)(2)(i) of this part.

(4) The CERCLA Type A Natural Resource Damage Assessment Model for Coastal and Marine Environments Technical Documentation, Volumes I–VI, dated April 1996, including Revision I dated October 1997, and Revision II dated December 1999, prepared for the U.S. Department of the Interior by Applied Science Associates, Inc., A.T. Kearney, Inc., and Hagler Bailly Consulting, Inc. (NRDAM/CME technical document). Interested parties may obtain a copy of this document from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; PB96–501788; ph: (703) 487–4650. Sections 11.34 (a), (b), and (e), 11.35(a), 11.36(b), 11.40(a), and 11.42(a), and Appendix II refer to this document.

(5) The CERCLA Type A Natural Resource Damage Assessment Model for Great Lakes Environments Technical Documentation, Volumes I–IV, dated April 1996, including Revision I dated October 1997, and Revision II dated December 1999, prepared for the U.S. Department of the Interior by Applied Science Associates, Inc., and Hagler Bailly Consulting, Inc. (NRDAM/GLE technical document). Interested parties may obtain a copy of this document from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; PB96–501770; ph: (703) 487–4650. Sections 11.34 (a), (b), and (e), 11.35(a), 11.36(b), 11.40(a), and 11.42(a), and Appendix III refer to this document.

(b) The publications or portions of publications listed in paragraph (a) of this section are available for inspection at the Office of the Federal Register, 800 North Capitol Street, NW., Washington, DC 20408. These

incorporations by reference were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a). These materials are incorporated as they exist on the date of the approval and a notice of any change in these materials will be published in the FEDERAL REGISTER.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 9772, Mar. 25, 1988; 61 FR 20609, May 7, 1996; 62 FR 60459, Nov. 10, 1997; 65 FR 6014, Feb. 8, 2000]

§ 11.19 [Reserved]

Subpart B—Preassessment Phase

§ 11.20 Notification and detection.

(a) *Notification.* (1) Section 104(b)(2) of CERCLA requires prompt notification of Federal and State natural resource trustees of potential damages to natural resources under investigation and requires coordination of the assessments, investigations, and planning under section 104 of CERCLA with such trustees.

(2) The NCP provides for the OSC or lead agency to notify the natural resource trustee when natural resources have been or are likely to be injured by a discharge of oil or a release of a hazardous substance being investigated under the NCP.

(3) Natural resource trustees, upon such notification described in paragraphs (a) (1) and (2) of this section, shall take such actions, as may be consistent with the NCP.

(b) *Previously unreported discharges or releases.* If a natural resource trustee identifies or is informed of apparent injuries to natural resources that appear to be a result of a previously unidentified or unreported discharge of oil or release of a hazardous substance, he should first make reasonable efforts to determine whether a discharge or release has taken place. In the case of a discharge or release not yet reported or being investigated under the NCP, the natural resource trustee shall report that discharge or release to the appropriate authority as designated in the NCP.

(c) *Identification of co-trustees.* The natural resource trustee should assist the OSC or lead agency, as needed, in identifying other natural resource trustees whose resources may be affected as a result of shared responsibility for the resources and who should be notified.

[53 FR 5172, Feb. 22, 1988]

§ 11.21 Emergency restorations.

(a) *Reporting requirements and definition.* (1) In the event of a natural resource emergency, the natural resource trustee shall contact the National Response Center (800/424-8802) to report the actual or threatened discharge or release and to request that an immediate response action be taken.

(2) An emergency is any situation related to a discharge or release requiring immediate action to avoid an irreversible loss of natural resources or to prevent or reduce any continuing danger to natural resources, or a situation in which there is a similar need for emergency action.

(b) *Emergency actions.* If no immediate response actions are taken at the site of the discharge or release by the EPA or the U.S. Coast Guard within the time that the natural resource trustee determines is reasonably necessary, or if such actions are insufficient, the natural resource trustee should exercise any existing authority he may have to take on-site response actions. The natural resource trustee shall determine whether the potentially responsible party, if his identity is known, is taking or will take any response action. If no on-site response actions are taken, the natural resource trustee may undertake limited off-site restoration action consistent with its existing authority to the extent necessary to prevent or reduce the immediate migration of the oil or hazardous substance onto or into the resource for which the Federal or State agency or Indian tribe may assert trusteeship.

(c) *Limitations on emergency actions.* The natural resource trustee may undertake only those actions necessary to abate the emergency situation, consistent with its existing authority. The normal procedures provided in this part must be followed before any additional restoration actions other than those necessary to abate the emergency situation are undertaken. The

burden of proving that emergency restoration was required and that restoration costs were reasonable and necessary based on information available at the time rests with the natural resource trustee.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5173, Feb. 22, 1988]

§ 11.22 Sampling of potentially injured natural resources.

(a) *General limitations.* Until the authorized official has made the determination required in § 11.23 of this part to proceed with an assessment, field sampling of natural resources should be limited to the conditions identified in this section. All sampling and field work shall be subject to the provisions of § 11.17 of this part concerning safety and applicability of resource protection statutes.

(b) *Early sampling and data collection.* Field samples may be collected or site visits may be made before completing the preassessment screen to preserve data and materials that are likely to be lost if not collected at that time and that will be necessary to the natural resource damage assessment. Field sampling and data collection at this stage should be coordinated with the lead agency under the NCP to minimize duplication of sampling and data collection efforts. Such field sampling and data collection should be limited to:

(1) Samples necessary to preserve perishable materials considered likely to have been affected by, and contain evidence of, the oil or hazardous substance. These samples generally will be biological materials that are either dead or visibly injured and that evidence suggests have been injured by oil or a hazardous substance;

(2) Samples of other ephemeral conditions or material, such as surface water or soil containing or likely to contain oil or a hazardous substance, where those samples may be necessary for identification and for measurement of concentrations, and where necessary samples may be lost because of factors such as dilution, movement, decomposition, or leaching if not taken immediately; and

(3) Counts of dead or visibly injured organisms, which may not be possible to take if delayed because of factors such as decomposition, scavengers, or water movement. Such counts shall be subject to the provisions of § 11.71(l)(5)(iii) of this part.

§ 11.23 Preassessment screen—general.

(a) *Requirement.* Before beginning any assessment efforts under this part, except as provided for under the emergency restoration provisions of § 11.21 of this part, the authorized official shall complete a preassessment screen and make a determination as to whether an assessment under this part shall be carried out.

(b) *Purpose.* The purpose of the preassessment screen is to provide a rapid review of readily available information that focuses on resources for which the Federal or State agency or Indian tribe may assert trusteeship under section 107(f) or section 126(d) of CERCLA. This review should ensure that there is a reasonable probability of making a successful claim before monies and efforts are expended in carrying out an assessment.

(c) *Determination.* When the authorized official has decided to proceed with an assessment under this part, the authorized official shall document the decision in terms of the criteria provided in paragraph (e) of this section in a Preassessment Screen Determination. This Preassessment Screen Determination shall be included in the Report of Assessment described in § 11.90 of this part.

(d) *Content.* The preassessment screen shall be conducted in accordance with the guidance provided in this section and in § 11.24—Preassessment screen—information on the site and § 11.25—Preassessment screen—preliminary identification of resources potentially at risk, of this part.

(e) *Criteria.* Based on information gathered pursuant to the preassessment screen and on information gathered pursuant to the NCP, the authorized official shall make a preliminary determination that all of the following criteria are met before proceeding with an assessment:

(1) A discharge of oil or a release of a hazardous substance has occurred;

(2) Natural resources for which the Federal or State agency or Indian tribe may assert trusteeship under CERCLA

have been or are likely to have been adversely affected by the discharge or release;

(3) The quantity and concentration of the discharged oil or released hazardous substance is sufficient to potentially cause injury, as that term is used in this part, to those natural resources;

(4) Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost; and

(5) Response actions, if any, carried out or planned do not or will not sufficiently remedy the injury to natural resources without further action.

(f) *Coordination.* (1) In a situation where response activity is planned or underway at a particular site, assessment activity shall be coordinated with the lead agency consistent with the NCP.

(2) Whenever, as part of a response action under the NCP, a preliminary assessment or an OSC Report is to be, or has been, prepared for the site, the authorized official should consult with the lead agency under the NCP, as necessary, and to the extent possible use information or materials gathered for the preliminary assessment or OSC Report, unless doing so would unnecessarily delay the preassessment screen.

(3) Where a preliminary assessment or an OSC Report does not exist or does not contain the information described in this section, that additional information may be gathered.

(4) If the natural resource trustee already has a process similar to the preassessment screen, and the requirements of the preassessment screen can be satisfied by that process, the processes may be combined to avoid duplication.

(g) *Preassessment phase costs.* (1) The following categories of reasonable and necessary costs may be incurred in the preassessment phase of the damage assessment:

(i) Release detection and identification costs;

(ii) Trustee identification and notification costs;

(iii) Potentially injured resource identification costs;

(iv) Initial sampling, data collection, and evaluation costs;

(v) Site characterization and preassessment screen costs; and

(vi) Any other preassessment costs for activities authorized by §§ 11.20 through 11.25 of this part.

(2) The reasonable and necessary costs for these categories shall be limited to those costs incurred by the authorized official for, and specifically allocable to, site-specific efforts taken during the preassessment phase for assessment of damages to natural resources for which the agency or Indian tribe is acting as trustee. Such costs shall be supported by appropriate records and documentation and shall not reflect regular activities performed by the agency or Indian tribe in management of the natural resource. Activities undertaken as part of the preassessment phase shall be taken in a manner that is cost-effective, as that phrase is used in this part.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5173, Feb. 22, 1988]

§ 11.24 Preassessment screen—information on the site.

(a) *Information on the site and on the discharge or release.* The authorized official shall obtain and review readily available information concerning:

(1) The time, quantity, duration, and frequency of the discharge or release;

(2) The name of the hazardous substance, as provided for in Table 302.4—List of Hazardous Substances and Reportable Quantities, 40 CFR 302.4;

(3) The history of the current and past use of the site identified as the source of the discharge of oil or release of a hazardous substance;

(4) Relevant operations occurring at or near the site;

(5) Additional oil or hazardous substances potentially discharged or released from the site; and

(6) Potentially responsible parties.

(b) *Damages excluded from liability under CERCLA.* (1) The authorized official shall determine whether the damages:

(i) Resulting from the discharge or release were specifically identified as an irreversible and irretrievable commitment of natural resources in an environmental impact statement or other comparable environmental analysis, that the decision to grant the permit

or license authorizes such commitment of natural resources, and that the facility or project was otherwise operating within the terms of its permit or license, so long as, in the case of damages to an Indian tribe occurring pursuant to a Federal permit or license, the issuance of that permit or license was not inconsistent with the fiduciary duty of the United States with respect to such Indian tribe; or

(ii) And the release of a hazardous substance from which such damages resulted have occurred wholly before enactment of CERCLA; or

(iii) Resulted from the application of a pesticide product registered under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 135–135k; or

(iv) Resulted from any other federally permitted release, as defined in section 101(10) of CERCLA; or

(v) Resulting from the release or threatened release of recycled oil from a service station dealer described in section 107(a)(3) or (4) of CERCLA if such recycled oil is not mixed with any other hazardous substance and is stored, treated, transported or otherwise managed in compliance with regulations or standards promulgated pursuant to section 3014 of the Solid Waste Disposal Act and other applicable authorities.

(2) An assessment under this part shall not be continued for potential injuries meeting one or more of the criteria described in paragraph (b)(1) of this section, which are exceptions to liability provided in sections 107(f), (i), and (j) and 114(c) of CERCLA.

(c) *Damages excluded from liability under the CWA.* (1) The authorized official shall determine whether the discharge meets one or more of the exclusions provided in section 311 (a)(2) or (b)(3) of the CWA.

(2) An assessment under this part shall not be continued for potential injuries from discharges meeting one or more of the CWA exclusions provided for in paragraph (c)(1) of this section.

[51 FR 27725, Aug. 1, 1986, as amended at 52 FR 9095, Mar. 20, 1987; 53 FR 5173, Feb. 22, 1988]

§ 11.25 Preassessment screen—preliminary identification of resources potentially at risk.

(a) *Preliminary identification of pathways.* (1) The authorized official shall make a preliminary identification of potential exposure pathways to facilitate identification of resources at risk.

(2) Factors to be considered in this determination should include, as appropriate, the circumstances of the discharge or release, the characteristics of the terrain or body of water involved, weather conditions, and the known physical, chemical, and toxicological properties of the oil or hazardous substance.

(3) Pathways to be considered shall include, as appropriate, direct contact, surface water, ground water, air, food chains, and particulate movement.

(b) *Exposed areas.* An estimate of areas where exposure or effects may have occurred or are likely to occur shall be made. This estimate shall identify:

(1) Areas where it has been or can be observed that the oil or hazardous substance has spread;

(2) Areas to which the oil or hazardous substance has likely spread through pathways; and

(3) Areas of indirect effect, where no oil or hazardous substance has spread, but where biological populations may have been affected as a result of animals moving into or through the site.

(c) *Exposed water estimates.* The area of ground water or surface water that may be or has been exposed may be estimated by using the methods described in appendix I of this part.

(d) *Estimates of concentrations.* An estimate of the concentrations of oil or a hazardous substance in those areas of potential exposure shall be developed.

(e) *Potentially affected resources.* (1) Based upon the estimate of the areas of potential exposure, and the estimate of concentrations in those areas, the authorized official shall identify natural resources for which he may assert trusteeship that are potentially affected by the discharge or release. This preliminary identification should be used to direct further investigations, but it is not intended to preclude consideration of other resources later found to be affected.

(2) A preliminary estimate, based on information readily available from resource managers, of the services of the resources identified as potentially affected shall be made. This estimate will be used in determining which resources to consider if further assessment efforts are justified.

Subpart C—Assessment Plan Phase

§ 11.30 What does the authorized official do if an assessment is warranted?

(a) If the authorized official determines during the Preassessment Phase that an assessment is warranted, the authorized official must develop a plan for the assessment of natural resource damages.

(b) *Purpose.* The purpose of the Assessment Plan is to ensure that the assessment is performed in a planned and systematic manner and that methodologies selected from subpart D for a type A assessment or from subpart E for a type B assessment, including the Injury Determination, Quantification, and Damage Determination phases, can be conducted at a reasonable cost, as that phrase is used in this part.

(c) *Assessment Plan phase costs.* (1) The following categories of reasonable and necessary costs may be incurred in the Assessment Plan phase of the damage assessment:

(i) Methodology identification and screening costs;

(ii) Potentially responsible party notification costs;

(iii) Public participation costs;

(iv) Exposure confirmation analysis costs;

(v) Preliminary estimate of damages costs; and

(vi) Any other Assessment Plan costs for activities authorized by §§ 11.30 through 11.38.

(2) The reasonable and necessary costs for these categories shall be limited to those costs incurred or anticipated by the authorized official for, and specifically allocable to, site specific efforts taken in the development of an Assessment Plan for a resource for which the agency or Indian tribe is acting as trustee. Such costs shall be supported by appropriate records and documentation, and shall not reflect regular activities performed by the agency or tribe in management of the natural resource. Activities undertaken as part of the Assessment Plan phase shall be taken in a manner that is cost-effective, as that phrase is used in this part.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5174, Feb. 22, 1988; 59 FR 14281, Mar. 25, 1994; 61 FR 20609, May 7, 1996]

§ 11.31 What does the Assessment Plan include?

(a) *General content and level of detail.* (1) The Assessment Plan must identify and document the use of all of the type A and/or type B procedures that will be performed.

(2) The Assessment Plan shall be of sufficient detail to serve as a means of evaluating whether the approach used for assessing the damage is likely to be cost-effective and meets the definition of reasonable cost, as those terms are used in this part. The Assessment Plan shall include descriptions of the natural resources and the geographical areas involved. The Assessment Plan shall also include a statement of the authority for asserting trusteeship, or co-trusteeship, for those natural resources considered within the Assessment Plan. The authorized official's statement of the authority for asserting trusteeship shall not have the force and effect of a rebuttable presumption under § 11.91(c) of this part. In addition, for type B assessments, the Assessment Plan shall include the sampling locations within those geographical areas, sample and survey design, numbers and types of samples to be collected, analyses to be performed, preliminary determination of the recovery period, and other such information required to perform the selected methodologies.

(3) The Assessment Plan shall contain information sufficient to demonstrate that the damage assessment has been coordinated to the extent possible with any remedial investigation feasibility study or other investigation performed pursuant to the NCP.

(4) The Assessment Plan shall contain procedures and schedules for sharing data, split samples, and results of analyses, when requested, with any

identified potentially responsible parties and other natural resource trustees.

(b) *Identification of types of assessment procedures.* The Assessment Plan must identify whether the authorized official plans to use a type A procedure, type B procedures, or a combination. Sections 11.34 through 11.36 contain standards for deciding which types of procedures to use. The Assessment Plan must include a detailed discussion of how these standards are met.

(c) *Specific requirements for type B procedures.* If the authorized official plans to use type B procedures, the Assessment Plan must also include the following:

(1) The results of the confirmation of exposure performed under § 11.37;

(2) A Quality Assurance Plan that satisfies the requirements listed in the NCP and applicable EPA guidance for quality control and quality assurance plans;

(3) The objectives, as required in § 11.64(a)(2) of this part, of any testing and sampling for injury or pathway determination; and

(4) The Restoration and Compensation Determination Plan developed in accordance with the guidance in § 11.81 of this part. If existing data are not sufficient to develop the Restoration and Compensation Determination Plan as part of the Assessment Plan, the Restoration and Compensation Determination Plan may be developed later, at any time before the completion of the Injury Determination or Quantification phases. If the Restoration and Compensation Determination Plan is published separately, the public review and comment will be conducted pursuant to § 11.81(d) of this part.

(d) *Specific requirements for type A procedures.* If the authorized official plans to use a type A procedure, the Assessment Plan must also contain the information described in subpart D.

[51 FR 27725, Aug. 1, 1986, as amended at 52 FR 9095, Mar. 20, 1987; 53 FR 5174, Feb. 22, 1988; 59 FR 14281, Mar. 25, 1994; 61 FR 20609, May 7, 1996]

§ 11.32 How does the authorized official develop the Assessment Plan?

(a) *Pre-development requirements.* The authorized official shall fulfill the following requirements before developing an Assessment Plan.

(1) *Coordination.* (i) If the authorized official's responsibility is shared with other natural resource trustees as a result of coexisting or contiguous natural resources or concurrent jurisdiction, the authorized official shall ensure that all other known affected natural resource trustees are notified that an Assessment Plan is being developed. This notification shall include the results of the Preassessment Screen Determination.

(ii) Authorized officials from different agencies or Indian tribes are encouraged to cooperate and coordinate any assessments that involve coexisting or contiguous natural resources or concurrent jurisdiction. They may arrange to divide responsibility for implementing the assessment in any manner that is agreed to by all of the affected natural resource trustees with the following conditions:

(A) A lead authorized official shall be designated to administer the assessment. The lead authorized official shall act as coordinator and contact regarding all aspects of the assessment and shall act as final arbitrator of disputes if consensus among the authorized officials cannot be reached regarding the development, implementation, or any other aspect of the Assessment Plan. The lead authorized official shall be designated by mutual agreement of all the natural resource trustees. If consensus cannot be reached as to the designation of the lead authorized official, the lead authorized official shall be designated in accordance with paragraphs (a)(1)(ii) (B), (C), or (D) of this section:

(B) When the natural resources being assessed are located on lands or waters subject to the administrative jurisdiction of a Federal agency, a designated official of the Federal agency shall act as the lead authorized official.

(C) When the natural resources being assessed, pursuant to section 126(d) of CERCLA, are located on lands or waters of an Indian tribe, an official designated by the Indian tribe shall act as the lead authorized official.

(D) For all other natural resources for which the State may assert trusteeship, a designated official of the State

agency shall act as the lead authorized official.

(iii) If there is a reasonable basis for dividing the assessment, the natural resource trustee may act independently and pursue separate assessments, actions, or claims so long as the claims do not overlap. In these instances, the natural resource trustees shall coordinate their efforts, particularly those concerning the sharing of data and the development of the Assessment Plans.

(2) *Identification and involvement of the potentially responsible party.* (i) If the lead agency under the NCP for response actions at the site has not identified potentially responsible parties, the authorized official shall make reasonable efforts to identify any potentially responsible parties.

(ii) In the event the number of potentially responsible parties is large or if some of the potentially responsible parties cannot be located, the authorized official may proceed against any one or more of the parties identified. The authorized official should use reasonable efforts to proceed against most known potentially responsible parties or at least against all those potentially responsible parties responsible for significant portions of the potential injury.

(iii)(A) The authorized official shall send a Notice of Intent to Perform an Assessment to all identified potentially responsible parties. The Notice shall invite the participation of the potentially responsible party, or, if several parties are involved and if agreed to by the lead authorized official, a representative or representatives designated by the parties, in the development of the type and scope of the assessment and in the performance of the assessment. The Notice shall briefly describe, to the extent known, the site, vessel, or facility involved, the discharge of oil or release of hazardous substance of concern to the authorized official, and the resources potentially at risk. The Notice shall also contain a statement of authority for asserting trusteeship, or co-trusteeship, over those natural resources identified as potentially at risk.

(B) The authorized official shall allow at least 30 calendar days, with reasonable extensions granted as appropriate, for the potentially responsible party or parties notified to respond to the Notice before proceeding with the development of the Assessment Plan or any other assessment actions.

(b) *Plan approval.* The authorized official shall have final approval as to the appropriate methodologies to include in the Assessment Plan and any modifications to the Assessment Plan.

(c) *Public involvement in the Assessment Plan.* (1) The authorized official must make the Assessment Plan available for review by any identified potentially responsible parties, other natural resource trustees, other affected Federal or State agencies or Indian tribes, and any other interested member of the public for a period of at least 30 calendar days, with reasonable extensions granted as appropriate. The authorized official may not perform any type B procedures described in the Assessment Plan until after this review period.

(2) Any comments concerning the Assessment Plan received from identified potentially responsible parties, other natural resource trustees, other affected Federal or State agencies or Indian tribes, and any other interested members of the public, together with responses to those comments, shall be included as part of the Report of Assessment, described in §11.90 of this part.

(d) *Plan implementation.* At the option of the authorized official and if agreed to by any potentially responsible party, or parties acting jointly, the potentially responsible party or any other party under the direction, guidance, and monitoring of the authorized official may implement all or any part of the Assessment Plan finally approved by the authorized official. Any decision by the authorized official to allow or not allow implementation by the potentially responsible party shall be documented in the Assessment Plan.

(e) *Plan modification.* (1) The Assessment Plan may be modified at any stage of the assessment as new information becomes available.

(2)(i) Any modification to the Assessment Plan that in the judgment of the authorized official is significant shall be made available for review by any

identified potentially responsible party, any other affected natural resource trustees, other affected Federal or State agencies or Indian tribes, and any other interested members of the public for a period of at least 30 calendar days, with reasonable extensions granted as appropriate, before tasks called for in the modified plan are begun.

(ii) Any modification to the Assessment Plan that in the judgment of the authorized official is not significant shall be made available for review by any identified potentially responsible party, any other affected natural resource trustees, other affected Federal or State agencies or Indian tribes, and any other interested members of the public, but the implementation of such modification need not be delayed as a result of such review.

(f) *Plan review.* (1) After the Injury Determination phase is completed and before the Quantification phase is begun, the authorized official shall review the decisions incorporated in the Assessment Plan.

(2) The purpose of this review is to ensure that the selection of methodologies for the Quantification and Damage Determination phases is consistent with the results of the Injury Determination phase, and that the use of such methodologies remains consistent with the requirements of reasonable cost, as that term is used in this part.

(3) Paragraphs (f)(1) and (f)(2) of this section do not apply to the use of a type A procedure.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5174, Feb. 22, 1988; 59 FR 14282, Mar. 25, 1994; 61 FR 20609, May 7, 1996]

§ 11.33 What types of assessment procedures are available?

There are two types of assessment procedures:

(a) Type A procedures are simplified procedures that require minimal field observation. Subpart D describes the type A procedures. There are two type A procedures: a procedure for coastal or marine environments, which incorporates the Natural Resource Damage Assessment Model for Coastal and Marine Environments, Version 2.51 (NRDAM/CME); and a procedure for Great Lakes environments, which incorporates the Natural Resource Damage Assessment Model for Great Lakes Environments, Version 1.51 (NRDAM/GLE).

(b) Type B procedures require more extensive field observation than the type A procedures. Subpart E describes the type B procedures.

[61 FR 20610, May 7, 1996, as amended at 62 FR 60459, Nov. 10, 1997; 65 FR 6014, Feb. 8, 2000]

§ 11.34 When may the authorized official use a type A procedure?

The authorized official may use a type A procedure only if:

(a) The released substance entered an area covered by the NRDAM/CME or NRDAM/GLE. Section 3.4, Volume III of the NRDAM/CME technical document (incorporated by reference, see § 11.18) identifies the areas that the NRDAM/CME covers. Section 6.2, Volume III of the NRDAM/GLE technical document (incorporated by reference, see § 11.18) describes the areas that the NRDAM/GLE covers;

(b) The NRDAM/CME or NRDAM/GLE cover the released substance. Table 7.1, Volume I of the NRDAM/CME technical document lists the substances that the NRDAM/CME covers. Table 7.1, Volume I of the NRDAM/GLE technical document lists the substances that the NRDAM/GLE covers;

(c) The released substance entered water at or near the surface;

(d) At the time of the release, winds did not vary spatially over the area affected by the release in a way that would significantly affect the level or extent of injuries;

(e) The authorized official is not aware of any reliable evidence that, for species that are likely to represent a significant portion of the claim, the species biomass is significantly lower than the species biomass assigned by the NRDAM/CME or the NRDAM/GLE Tables IV.2.1 through IV.2.115 and IV.5.1 through IV.5.77, Volume III of the NRDAM/CME technical document list the species biomasses in the NRDAM/CME. Tables III.3.17 through III.3.27 and III.3.40 through III.3.50, Volume III of the NRDAM/GLE technical document list the species biomasses in the NRDAM/GLE ; and

(f) Subsurface currents either: are not expected to significantly affect the level or extent of injuries; or are reasonably uniform with depth over the water column in the area affected by the release.

[61 FR 20610, May 7, 1996]

§ 11.35 How does the authorized official decide whether to use type A or type B procedures?

(a) If the authorized official determines under § 11.34 that a type A procedure is available, the authorized official must then decide whether to use that procedure or use type B procedures. The authorized official must make this decision by weighing the difficulty of collecting site-specific data against the suitability of the averaged data and simplifying assumptions in the type A procedure for the release being assessed. The authorized official may use type B procedures if they can be performed at a reasonable cost and if the increase in accuracy provided by those procedures outweighs the increase in assessment costs. Section 1, Volume I of the NRDAM/CME technical document (incorporated by reference, see § 11.18) lists the simplifying assumptions made in the NRDAM/CME. Volumes III through IV of the NRDAM/CME technical document list the data in the NRDAM/CME. Section 1, Volume I of the NRDAM/GLE technical document (incorporated by reference, see § 11.18) lists the simplifying assumptions made in the NRDAM/GLE. Volume III of the NRDAM/GLE technical document lists the data in the NRDAM/GLE.

(b) The authorized official must use type B procedures rather than a type A procedure whenever a potentially responsible party:

(1) Submits a written request for use of type B procedures along with documentation of the reasons supporting the request; and

(2) Advances all reasonable costs of using type B procedures within a time frame acceptable to the authorized official.

(c) If there is no available type A procedure, the authorized official must use type B procedures to calculate all damages.

(d) Except as provided in paragraph (b) of this section, the authorized official may change the type of procedure used in light of comments received on the Assessment Plan. [See § 11.32(e)(2) to determine if the authorized official must provide for additional public review.] However, if the authorized official decides to use type B procedures in lieu of a type A procedure, and cannot confirm exposure under § 11.37, the authorized official may not then use a type A procedure.

[61 FR 20610, May 7, 1996]

§ 11.36 May the authorized official use both type A and type B procedures for the same release?

(a) The authorized official may use both a type A procedure and type B procedures for the same release if:

(1) The type B procedures are cost-effective and can be performed at a reasonable cost;

(2) There is no double recovery; and

(3) The type B procedures are used only to determine damages for injuries or compensable values that do not fall into the categories addressed by the type A procedure. [Sections 11.14(v) and 11.62 define "injury." Section 11.83(c)(1) defines "compensable value."]

(b) The type A procedures address the following categories of injury and compensable value:

(1) Direct mortality of species covered by the NRDAM/CME or NRDAM/GLE resulting from short-term exposure to the released substance. Volume IV of the NRDAM/CME technical document (incorporated by reference, see § 11.18) lists the species that the NRDAM/CME covers. Section 3, Volume III of the NRDAM/GLE technical document (incorporated by reference, see § 11.18) lists the species that the NRDAM/GLE covers;

(2) Direct loss of production of species covered by the NRDAM/CME or NRDAM/GLE resulting from short-term exposure to the released substance;

(3) Indirect mortality of species covered by the NRDAM/CME or NRDAM/GLE resulting from disruption of the food web by direct mortality or direct loss of production;

(4) Indirect loss of production of species covered by the NRDAM/CME or

NRDAM/GLE resulting from disruption of the food web by direct mortality or direct loss of production;

(5) Lost assimilative capacity of water column and sediments;

(6) Lost economic rent for lost commercial harvests resulting from any closures specified by the authorized official and/or from population losses;

(7) Lost recreational harvests resulting from any closures specified by the authorized official and/or from population losses;

(8) For the type A procedure for coastal and marine environments, lost wildlife viewing, resulting from population losses, by residents of the States bordering the provinces in which the population losses occurred. [A province is one of the geographic areas delineated in Table 6.1, Volume I of the NRDAM/CME technical document.] For the type A procedure for Great Lakes environments, lost wildlife viewing, resulting from population losses, by residents of local areas bordering the provinces in which the population losses occurred. [A province is one of the geographic areas delineated in Table 8.1, Volume I of the NRDAM/GLE technical document.];

(9) Lost beach visitation due to closure; and

(10) For the type A procedure for Great Lakes environments, lost boating due to closure.

(c) If the authorized official uses both type A and type B procedures, he or she must explain in the Assessment Plan how he or she intends to prevent double recovery.

(d) When the authorized official uses type B procedures for injuries not addressed in a type A procedure, he or she must follow all of subpart E (which contains standards for determining and quantifying injury as well as determining damages), §11.31(c) (which addresses content of the Assessment Plan), and §11.37 (which addresses confirmation of exposure). When the authorized official uses type B procedures for compensable values that are not included in a type A procedure but that result from injuries that are addressed in the type A procedure, he or she need not follow all of subpart E, §11.31(c), and §11.37. Instead, the authorized official may rely on the injury predictions of the type A procedure and simply use the valuation methodologies authorized by §11.83(c) to calculate compensable value. When using valuation methodologies, the authorized official must comply with §11.84.

[61 FR 20610, May 7, 1996]

§11.37 Must the authorized official confirm exposure before implementing the Assessment Plan?

(a) Before including any type B methodologies in the Assessment Plan, the authorized official must confirm that at least one of the natural resources identified as potentially injured in the preassessment screen has in fact been exposed to the released substance.

(b) *Procedures.* (1) Whenever possible, exposure shall be confirmed by using existing data, such as those collected for response actions by the OSC, or other available studies or surveys of the assessment area.

(2) Where sampling has been done before the completion of the preassessment screen, chemical analyses of such samples may be performed to confirm that exposure has occurred. Such analyses shall be limited to the number and type required for confirmation of exposure.

(3) Where existing data are unavailable or insufficient to confirm exposure, one or more of the analytical methodologies provided in the Injury Determination phase may be used. The collection and analysis of new data shall be limited to that necessary to confirm exposure and shall not include testing for baseline levels or for injury, as those phrases are used in this part.

[51 FR 27725, Aug. 1, 1986. Redesignated and amended at 61 FR 20610, 20611, May 7, 1996]

§11.38 Assessment Plan—preliminary estimate of damages.

(a) *Requirement.* When performing a type B assessment pursuant to the requirements of subpart E of this part, the authorized official shall develop a preliminary estimate of: the anticipated costs of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources for the injured natural resources; and the compensable value, as defined in §11.83(c) of this part, of the injured natural resources,

if the authorized official intends to include compensable value in the damage claim. This preliminary estimate is referred to as the preliminary estimate of damages. The authorized official shall use the guidance provided in this section, to the extent possible, to develop the preliminary estimate of damages.

(b) *Purpose.* The purpose of the preliminary estimate of damages is for reference in the scoping of the Assessment Plan to ensure that the choice of the scientific, cost estimating, and valuation methodologies expected to be used in the damage assessment fulfills the requirements of reasonable cost, as that term is used in this part. The authorized official will also use the preliminary estimate of damages in the review of the Assessment Plan, as required in §11.32(f) of this part, to ensure the requirements of reasonable cost are still met.

(c) *Steps.* The preliminary estimate of damages should include consideration of the ability of the resources to recover naturally and, if relevant, the compensable value through the recovery period with and without possible alternative actions. The authorized official shall consider the following factors, to the extent possible, in making the preliminary estimate of damages:

(1) The preliminary estimate of costs of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources should include consideration of a range of possible alternative actions that would accomplish the restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured natural resources.

(i) The preliminary estimate of costs should take into account the effects, or anticipated effects, of any response actions.

(ii) The preliminary estimate of costs should represent the expected present value of anticipated costs, expressed in constant dollars, and should include direct and indirect costs, and include the timing of those costs. The provisions detailed in §§11.80–11.84 of this part are the basis for the development of the estimate.

(iii) The discount rate to be used in developing the preliminary estimate of costs shall be that determined in accordance with the guidance in §11.84(e) of this part.

(2) The preliminary estimate of compensable value should be consistent with the range of possible alternatives for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources being considered.

(i) The preliminary estimate of compensable value should represent the expected present value of the anticipated compensable value, expressed in constant dollars, accrued through the period for the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources to baseline conditions, i.e., between the occurrence of the discharge or release and the completion of the restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured resources and their services. The estimate should use the same base year as the preliminary estimate of costs of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources. The provisions detailed in §§11.80–11.84 of this part are the basis for the development of this estimate.

(ii) The preliminary estimate of compensable value should take into account the effects, or anticipated effects, of any response actions.

(iii) The discount rate to be used in developing the preliminary estimate of compensable value shall be that determined in accordance with the guidance in §11.84(e) of this part.

(d) *Content and timing.* (1) In making the preliminary estimate of damages, the authorized official should rely upon existing data and studies. The authorized official should not undertake significant new data collection or perform significant modeling efforts at this stage of the assessment planning phase.

(2) Where possible, the authorized official should make the preliminary estimate of damages before the completion of the Assessment Plan as provided for in §11.31 of this part. If there is not sufficient existing data to make the preliminary estimate of damages at the same time as the assessment planning phase, this analysis may be

completed later, at the end of the Injury Determination phase of the assessment, at the time of the Assessment Plan review.

(3) The authorized official is not required to disclose the preliminary estimate before the conclusion of the assessment. At the conclusion of the assessment, the preliminary estimate of damages, along with its assumptions and methodology, shall be included in the Report of the Assessment as provided for in § 11.91 of this part.

(e) *Review.* The authorized official shall review, and revise as appropriate, the preliminary estimate of damages at the end of the Injury Determination and Quantification phases. If there is any significant modification of the preliminary estimate of damages, the authorized official shall document it in the Report of the Assessment.

[59 FR 14282, Mar. 25, 1994. Redesignated at 61 FR 20610, May 7, 1996]

Subpart D—Type A Procedures

§ 11.40 What are type A procedures?

(a) A type A procedure is a standardized methodology for performing Injury Determination, Quantification, and Damage Determination that requires minimal field observation. There are two type A procedures: the type A procedure for coastal and marine environments; and the type A procedure for Great Lakes environments. The type A procedure for coastal and marine environments incorporates a computer model called the Natural Resource Damage Assessment Model for Coastal and Marine Environments Version 2.51 (NRDAM/CME). The NRDAM/CME technical document (incorporated by reference, see § 11.18) includes and explains the NRDAM/CME. The type A procedure for Great Lakes environments incorporates a computer model called the Natural Resource Damage Assessment Model for Great Lakes Environments Version 1.51 (NRDAM/GLE). The NRDAM/GLE technical document (incorporated by reference, see § 11.18) includes and explains the NRDAM/GLE. The authorized official must follow §§ 11.41 through 11.44 when using the type A procedures.

(b) The reasonable and necessary costs incurred in conducting assessments under this subpart shall be limited to those costs incurred or anticipated by the authorized official for, and specifically allocable to, incident-specific efforts taken in the assessment of damages for natural resources for which the agency or Indian tribe is acting as trustee. Such costs shall be supported by appropriate records and documentation, and shall not reflect regular activities performed by the agency or the Indian tribe in management of the natural resource. Activities undertaken as part of the damage assessment shall be taken in a manner that is cost-effective, as that phrase is used in this part.

[52 FR 9096, Mar. 20, 1987, as amended at 53 FR 5175, Feb. 22, 1988; 61 FR 20611, May 7, 1996; 62 FR 60459, Nov. 10, 1997; 65 FR 6014, Feb. 8, 2000]

§ 11.41 What data must the authorized official supply?

(a) The NRDAM/CME and the NRDAM/GLE require several data inputs to operate. The authorized official must develop the following data inputs:

(1) The identity of the released substance;

(2) The mass or volume of the identified substance that was released;

(3) The duration of the release;

(4) The time of the release;

(5) The location of the release;

(6) The wind conditions;

(7) The extent of response actions;

(8) The extent of any closures;

(9) The implicit price deflator; and

(10) For the NRDAM/CME, the condition of the currents and tides.

(b) The authorized official must change the data in the NRDAM/CME and the NRDAM/GLE for the following parameters if he or she is aware of more accurate data:

(1) Air temperature;

(2) Water temperature at the surface;

(3) Total suspended sediment concentration;

(4) Mean settling velocity of suspended solids; and

(5) Habitat type.

(c)(1) If the release occurred in Alaska and the authorized official is not aware of any reliable evidence that ice was absent from the site of the release, then he or she must turn on the ice

modeling function. Otherwise, the authorized official must leave the ice modeling function off.

(2) If the release occurred in the Great Lakes and the authorized official is aware of reliable evidence that ice was absent from the site of the release, then he or she must turn off the ice modeling function.

(d) The authorized official must develop the data inputs and modifications and include them in the Assessment Plan in the format specified in Appendix II (for the NRDAM/CME) or Appendix III (for the NRDAM/GLE).

[61 FR 20611, May 7, 1996]

§ 11.42 How does the authorized official apply the NRDAM/CME or NRDAM/GLE?

(a) The authorized official must perform a preliminary application of the NRDAM/CME or NRDAM/GLE with the data inputs and modifications developed under §;11.41. Volume II of the NRDAM/CME technical document (incorporated by reference, see §;11.18) describes how to apply the NRDAM/CME. Volume II of the NRDAM/GLE technical document (incorporated by reference, see § 11.18) describes how to apply the NRDAM/GLE. For cases involving releases of two or more substances or a release of a mixture of substances, the authorized official may only apply the NRDAM/CME or NRDAM/GLE once using only one of the substances.

(b) If the preliminary application of the NRDAM/CME or NRDAM/GLE indicates damages in excess of $100,000, then the authorized official must decide whether to:

(1) Limit the portion of his or her claim calculated with the type A procedure to $100,000; or

(2) Compute all damages using type B procedures.

[61 FR 20611, May 7, 1996]

§ 11.43 Can interested parties review the results of the preliminary application?

After completing the preliminary application of the NRDAM/CME or NRDAM/GLE, if the authorized official decides to continue with the type A procedure, he or she must issue an Assessment Plan for public comment as described in § 11.32. The Assessment Plan must include the information described in § 11.31, the data inputs and modifications developed under § 11.41, and a summary of the results of the preliminary application. The Assessment Plan must also identify a contact from whom a complete copy of the printout of the preliminary application can be obtained.

[61 FR 20612, May 7, 1996]

§ 11.44 What does the authorized official do after the close of the comment period?

(a) The authorized official must carefully review all comments received on the Assessment Plan, provide substantive responses to all comments, and modify the Plan as appropriate. [See § 11.32(e)(2) to determine if the authorized official must provide for additional public review.]

(b) If, after reviewing the public comments, the authorized official decides to continue with the type A procedure, he or she must then perform a final application of the NRDAM/CME or NRDAM/GLE, using final data inputs and modifications based on § 11.41 and any reliable information received during the public review and comment period.

(c) After completing the final application of the NRDAM/CME or NRDAM/GLE, the authorized official must prepare a Report of Assessment. The Report of Assessment must include the printed output from the final application as well as the Preassessment Screen Determination and the Assessment Plan.

(d) If the authorized official is aware of reliable evidence that a private party has recovered damages for commercial harvests lost as a result of the release, the authorized official must eliminate from the claim any damages for such lost harvests that are included in the lost economic rent calculated by the NRDAM/CME or NRDAM/GLE.

(e) If the authorized official is aware of reliable evidence that the NRDAM/CME or NRDAM/GLE application covers resources beyond his or her trustee jurisdiction, the authorized official must either:

(1) Have the other authorized official(s) who do have trustee jurisdiction

over those resources join in the type A assessment; or

(2) Eliminate any damages for those resources from the claim for damages.

(f) If the final application of the NRDAM/CME or NRDAM/GLE, adjusted as needed under paragraphs (d) and (e), calculates damages in excess of $100,000, then the authorized official must limit the portion of his or her claim calculated with the type A procedure to $100,000.

(g) After preparing the Report of Assessment, the authorized official must follow the steps described in subpart F.

[61 FR 20612, May 7, 1996]

Subpart E—Type B Procedures

§ 11.60 Type B assessments—general.

(a) *Purpose.* The purpose of the type B assessment is to provide alternative methodologies for conducting natural resource damage assessments in individual cases.

(b) *Steps in the type B assessment.* The type B assessment consists of three phases: § 11.61—Injury Determination; § 11.70—Quantification; and § 11.80—Damage Determination, of this part.

(c) *Completion of type B assessment.* After completion of the type B assessment, a Report of Assessment, as described in § 11.90 of this part, shall be prepared. The Report of Assessment shall include the determinations made in each phase.

(d) *Type B assessment costs.* (1) The following categories of reasonable and necessary costs may be incurred in the assessment phase of the damage assessment:

(i) Sampling, testing, and evaluation costs for injury and pathway determination;

(ii) Quantification costs (including baseline service determination and resource recoverability analysis);

(iii) Restoration and Compensation Determination Plan development costs including:

(A) Development of alternatives;

(B) Evaluation of alternatives;

(C) Potentially responsible party, agency, and public reviews;

(D) Other such costs for activities authorized by § 11.81 of this part;

(iv) Cost estimating and valuation methodology calculation costs; and

(v) Any other assessment costs authorized by §§ 11.60–11.84 of this part.

(2) The reasonable and necessary costs for these categories shall be limited to those costs incurred or anticipated by the authorized official for, and specifically allocable to, site-specific efforts taken in the assessment of damages for a natural resource for which the agency or Indian tribe is acting as trustee. Such costs shall be supported by appropriate records and documentation, and shall not reflect regular activities performed by the agency or the Indian tribe in management of the natural resource. Activities undertaken as part of the damage assessment phase shall be taken in a manner that is cost-effective, as that phrase is used in this part.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5175, Feb. 22, 1988; 59 FR 14283, Mar. 25, 1994]

§ 11.61 Injury determination phase—general.

(a) *Requirement.* (1) The authorized official shall, in accordance with the procedures provided in the Injury Determination phase of this part, determine: whether an injury to one or more of the natural resources has occurred; and that the injury resulted from the discharge of oil or release of a hazardous substance based upon the exposure pathway and the nature of the injury.

(2) The Injury Determination phase consists of § 11.61—general; § 11.62—injury definition; § 11.63—pathway determination; and § 11.64—testing and sampling methods, of this part.

(b) *Purpose.* The purpose of the Injury Determination phase is to ensure that only assessments involving well documented injuries resulting from the discharge of oil or release of a hazardous substance proceed through the type B assessment.

(c) *Injury Determination phase steps.* (1) The authorized official shall determine whether the potentially injured resource constitutes a surface water, ground water, air, geologic, or biological resource as defined in § 11.14 of this part. The authorized official shall then proceed in accordance with the guidance provided in the injury definition section, § 11.62 of this part, to determine if the resource is injured.

(2) The authorized official shall follow the guidance provided in the testing and sampling methods section, §11.64 of this part, in selecting the methodology for determining injury. The authorized official shall select from available testing and sampling procedures one or more procedures that meet the requirements of the selected methodologies.

(3) The authorized official shall follow the guidance provided in the pathway section, §11.63 of this part, to determine the route through which the oil or hazardous substance is or was transported from the source of the discharge or release to the injured resource.

(4) If more than one resource, as defined in §11.14(z) of this part, has potentially been injured, an injury determination for each resource shall be made in accordance with the guidance provided in each section of the Injury Determination phase.

(d) *Selection of methodologies.* (1) One of the methodologies provided in §11.64 of this part for the potentially injured resource, or one that meets the acceptance criteria provided for that resource, shall be used to establish injury.

(2) Selection of the methodologies for the Injury Determination phase shall be based upon cost-effectiveness as that phrase is used in this part.

(e) *Completion of Injury Determination phase.* (1) Upon completion of the Injury Determination phase, the Assessment Plan shall be reviewed in accordance with the requirements of §11.32(f) of this part.

(2) When the authorized official has determined that one or more of the natural resources has been injured as a result of the discharge or release, the authorized official may proceed to the Quantification and the Damage Determination phases.

(3) When the authorized official has determined that an injury has not occurred to at least one of the natural resources or that an injury has occurred but that the injury cannot be linked to the discharge or release, the authorized official shall not pursue further assessment under this part.

§11.62 Injury determination phase—injury definition.

(a) The authorized official shall determine that an injury has occurred to natural resources based upon the definitions provided in this section for surface water, ground water, air, geologic, and biological resources. The authorized official shall test for injury using the methodologies and guidance provided in §11.64 of this part. The test results of the methodologies must meet the acceptance criteria provided in this section to make a determination of injury.

(b) *Surface water resources.* (1) An injury to a surface water resource has resulted from the discharge of oil or release of a hazardous substance if one or more of the following changes in the physical or chemical quality of the resource is measured:

(i) Concentrations and duration of substances in excess of drinking water standards as established by sections 1411–1416 of SDWA, or by other Federal or State laws or regulations that establish such standards for drinking water, in surface water that was potable before the discharge or release;

(ii) Concentrations and duration of substances in excess of water quality criteria established by section 1401(1)(D) of SDWA, or by other Federal or State laws or regulations that establish such criteria for public water supplies, in surface water that before the discharge or release met the criteria and is a committed use, as the phrase is used in this part, as a public water supply;

(iii) Concentrations and duration of substances in excess of applicable water quality criteria established by section 304(a)(1) of the CWA, or by other Federal or State laws or regulations that establish such criteria, in surface water that before the discharge or release met the criteria and is a committed use, as that phrase is used in this part, as a habitat for aquatic life, water supply, or recreation. The most stringent criterion shall apply when surface water is used for more than one of these purposes;

(iv) Concentrations of substances on bed, bank, or shoreline sediments sufficient to cause the sediment to exhibit

characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act, 42 U.S.C. 6921; or

(v) Concentrations and duration of substances sufficient to have caused injury as defined in paragraphs (c), (d), (e), or (f) of this section to ground water, air, geologic, or biological resources, when exposed to surface water, suspended sediments, or bed, bank, or shoreline sediments.

(2)(i) The acceptance criterion for injury to the surface water resource is the measurement of concentrations of oil or a hazardous substance in two samples from the resource. The samples must be one of the following types, except as specified in paragraph (b)(3) of this section:

(A) Two water samples from different locations, separated by a straight-line distance of not less than 100 feet; or

(B) Two bed, bank, or shoreline sediment samples from different locations separated by a straight-line distance of not less than 100 feet; or

(C) One water sample and one bed, bank, or shoreline sediment sample; or

(D) Two water samples from the same location collected at different times.

(ii) In those instances when injury is determined and no oil or hazardous substances are detected in samples from the surface water resource, it must be demonstrated that the substance causing injury occurs or has occurred in the surface water resource as a result of physical, chemical, or biological reactions initiated by the discharge of oil or release of a hazardous substance.

(3) If the maximum straight-line distance of the surface water resource is less than 100 feet, then the samples required in paragraph (b)(2)(i) (A) and (B) of this section should be separated by one-half the maximum straight-line distance of the surface water resource.

(c) *Ground water resources.* (1) An injury to the ground water resource has resulted from the discharge of oil or release of a hazardous substance if one or more of the following changes in the physical or chemical quality of the resource is measured:

(i) Concentrations of substances in excess of drinking water standards, established by sections 1411–1416 of the SDWA, or by other Federal or State laws or regulations that establish such standards for drinking water, in ground water that was potable before the discharge or release;

(ii) Concentrations of substances in excess of water quality criteria, established by section 1401(1)(d) of the SDWA, or by other Federal or State laws or regulations that establish such criteria for public water supplies, in ground water that before the discharge or release met the criteria and is a committed use, as the phrase is used in this part, as a public water supply;

(iii) Concentrations of substances in excess of applicable water quality criteria, established by section 304(a)(1) of the CWA, or by other Federal or State laws or regulations that establish such criteria for domestic water supplies, in ground water that before the discharge or release met the criteria and is a committed use as that phrase is used in this part, as a domestic water supply; or

(iv) Concentrations of substances sufficient to have caused injury as defined in paragraphs (b), (d), (e), or (f) of this section to surface water, air, geologic, or biological resources, when exposed to ground water.

(2) The acceptance criterion for injury to ground water resources is the measurement of concentrations of oil or hazardous substance in two ground water samples. The water samples must be from the same geohydrologic unit and must be obtained from one of the following pairs of sources, except as specified in paragraph (c)(3) of this section:

(i) Two properly constructed wells separated by a straight-line distance of not less than 100 feet; or

(ii) A properly constructed well and a natural spring or seep separated by a straight-line distance of not less than 100 feet; or

(iii) Two natural springs or seeps separated by a straight-line distance of not less than 100 feet.

(3) If the maximum straight-line distance of the ground water resource is less than 100 feet, the samples required in paragraph (c)(2) of this section should be separated by one-half of the maximum straight-line distance of the ground water resource.

(4) In those instances when injury is determined and no oil or hazardous substance is detected in samples from the ground water resource, it must be demonstrated that the substance causing injury occurs or has occurred in the ground water resource as a result of physical, chemical, or biological reactions initiated by the discharge of oil or release of hazardous substances.

(d) *Air resources.* An injury to the air resource has resulted from the discharge of oil or release of a hazardous substance if one or more of the following changes in the physical or chemical quality of the resource is measured:

(1) Concentrations of emissions in excess of standards for hazardous air pollutants established by section 112 of the Clean Air Act, 42 U.S.C. 7412, or by other Federal or State air standards established for the protection of public welfare or natural resources; or

(2) Concentrations and duration of emissions sufficient to have caused injury as defined in paragraphs (b), (c), (e), or (f) of this section to surface water, ground water, geologic, or biological resources when exposed to the emissions.

(e) *Geologic resources.* An injury to the geologic resource has resulted from the discharge of oil or release of a hazardous substance if one or more of the following changes in the physical or chemical quality of the resource is measured:

(1) Concentrations of substances sufficient for the materials in the geologic resource to exhibit characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act, 42 U.S.C. 6921;

(2) Concentrations of substances sufficient to raise the negative logarithm of the hydrogen ion concentration of the soil (pH) to above 8.5 (above 7.5 in humid areas) or to reduce it below 4.0;

(3) Concentrations of substances sufficient to yield a salt saturation value greater than 2 millimhos per centimeter in the soil or a sodium adsorption ratio of more than 0.176;

(4) Concentrations of substances sufficient to decrease the water holding capacity such that plant, microbial, or invertebrate populations are affected;

(5) Concentrations of substances sufficient to impede soil microbial respiration to an extent that plant and microbial growth have been inhibited;

(6) Concentrations in the soil of substances sufficient to inhibit carbon mineralization resulting from a reduction in soil microbial populations;

(7) Concentrations of substances sufficient to restrict the ability to access, develop, or use mineral resources within or beneath the geologic resource exposed to the oil or hazardous substance;

(8) Concentrations of substances sufficient to have caused injury to ground water, as defined in paragraph (c) of this section, from physical or chemical changes in gases or water from the unsaturated zone;

(9) Concentrations in the soil of substances sufficient to cause a toxic response to soil invertebrates;

(10) Concentrations in the soil of substances sufficient to cause a phytotoxic response such as retardation of plant growth; or

(11) Concentrations of substances sufficient to have caused injury as defined in paragraphs (b), (c), (d), or (f), of this section to surface water, ground water, air, or biological resources when exposed to the substances.

(f) *Biological resources.* (1) An injury to a biological resource has resulted from the discharge of oil or release of a hazardous substance if concentration of the substance is sufficient to:

(i) Cause the biological resource or its offspring to have undergone at least one of the following adverse changes in viability: death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations; or

(ii) Exceed action or tolerance levels established under section 402 of the Food, Drug and Cosmetic Act, 21 U.S.C. 342, in edible portions of organisms; or

(iii) Exceed levels for which an appropriate State health agency has issued directives to limit or ban consumption of such organism.

(2) The method for determining injury to a biological resource, as defined in paragraph (f)(1)(i) of this section, shall be chosen based upon the capability of the method to demonstrate a

measurable biological response. An injury can be demonstrated if the authorized official determines that the biological response under consideration can satisfy all of the following acceptance criteria:

(i) The biological response is often the result of exposure to oil or hazardous substances. This criterion excludes biological responses that are caused predominately by other environmental factors such as disturbance, nutrition, trauma, or weather. The biological response must be a commonly documented response resulting from exposure to oil or hazardous substances.

(ii) Exposure to oil or hazardous substances is known to cause this biological response in free-ranging organisms. This criterion identifies biological responses that have been documented to occur in a natural ecosystem as a result of exposure to oil or hazardous substances. The documentation must include the correlation of the degree of the biological response to the observed exposure concentration of oil or hazardous substances.

(iii) Exposure to oil or hazardous substances is known to cause this biological response in controlled experiments. This criterion provides a quantitative confirmation of a biological response occurring under environmentally realistic exposure levels that may be linked to oil or hazardous substance exposure that has been observed in a natural ecosystem. Biological responses that have been documented only in controlled experimental conditions are insufficient to establish correlation with exposure occurring in a natural ecosystem.

(iv) The biological response measurement is practical to perform and produces scientifically valid results. The biological response measurement must be sufficiently routine such that it is practical to perform the biological response measurement and to obtain scientifically valid results. To meet this criterion, the biological response measurement must be adequately documented in scientific literature, must produce reproducible and verifiable results, and must have well defined and accepted statistical criteria for interpreting as well as rejecting results.

(3) Unless otherwise provided for in this section, the injury determination must be based upon the establishment of a statistically significant difference in the biological response between samples from populations in the assessment area and in the control area. The determination as to what constitutes a statistically significant difference must be consistent with the quality assurance provisions of the Assessment Plan. The selection of the control area shall be consistent with the guidance provided in § 11.72 of this part.

(4) The biological responses listed in this paragraph have been evaluated and found to satisfy the acceptance criteria provided in paragraph (f)(2) of this section. The authorized official may, when appropriate, select from this list to determine injury to fish and wildlife resources or may designate another response as the determiner of injury provided that the designated response can satisfy the acceptance criteria provided in paragraph (f)(2) of this section. The biological responses are listed by the categories of injury for which they may be applied.

(i) *Category of injury—death.* Five biological responses for determining when death is a result of exposure to the discharge of oil or release of a hazardous substance have met the acceptance criteria.

(A) *Brain cholinesterase (ChE) enzyme activity.* Injury has occurred when brain ChE activity in a sample from the population has been inhibited by at least 50 percent compared to the mean for normal brain ChE activity of the wildlife species. These enzymes are in the nervous system of vertebrate organisms and the rate of ChE activity is associated with the regulation of nerve impulse transmission. This biological response may be used to confirm injury when anti-ChE substances, such as organophosphorus and carbamate pesticides, are suspected to have resulted in death to bird and mammal species.

(B) *Fish kill investigations.* Injury has occurred when a significant increase in the frequency or numbers of dead or dying fish can be measured in accordance with the procedures for counting dead or dying fish contained in Part II (Fish-Kill Counting Guidelines) of "Monetary Values of Freshwater Fish

and Fish-Kill Counting Guidelines," American Fisheries Society Special Publication Number 13, 1982 (incorporated by reference, see § 11.18).

(C) *Wildlife kill investigations.* Injury has occurred when a significant increase in the frequency or number of dead or dying birds or mammal species can be measured in a population sample from the assessment area as compared to a population sample from a control area. Wildlife kill investigations may be used when acute mortality has occurred to multiple wildlife species, or when detectable quantities of oil or hazardous substances have adherred to, bound to, or otherwise covered surface tissue, or had been ingested or inhaled by dead or dying bird or mammal species.

(D) *In situ bioassay.* Injury has occurred when a statistically significant difference can be measured in the total mortality and/or mortality rates between population samples exposed in situ to a discharge of oil or a release of hazardous substance and those in a control site. In situ caged or confined bioassay may be used to confirm injury when oil or hazardous substances are suspected to have caused death to fish species.

(E) *Laboratory toxicity testing.* Injury has occurred when a statistically significant difference can be measured in the total mortality and/or mortality rates between population samples of the test organisms placed in exposure chambers containing concentrations of oil or hazardous substances and those in a control chamber. Published standardized laboratory fish toxicity testing methodologies for acute flow-through, acute static, partial-chronic (early life stage), and chronic (life cycle) toxicity tests may be used to confirm injury. The oil or hazardous substance used in the test must be the exact substance or a substance that is reasonably comparable to that suspected to have caused death to the natural population of fish.

(ii) *Category of injury—disease.* One biological response for determining when disease is a result of exposure to the discharge of oil or release of a hazardous substance has met the acceptance criteria.

(A) *Fin erosion.* Injury has occurred when a statistically significant difference can be measured in the frequency of occurrence of fin erosion (also referred to as fin rot) in a population sample from the assessment area as compared to a sample from the control area. Fin erosion shall be confirmed by appropriate histological procedures. Fin erosion may be used when oil or hazardous substances are suspected to have caused the disease.

(iii) *Category of injury—behavioral abnormalities.* Two biological responses for determining when behavioral abnormalities are a result of the exposure to the discharge of oil or release of a hazardous substance have met the acceptance criteria.

(A) *Clinical behavioral signs of toxicity.* Injury has occurred when a statistically significant difference can be measured in the frequency of occurrence of clinical behavioral signs of toxicity in a population sample from the assessment area as compared to a sample from the control area. Clinical behavioral signs of toxicity are characteristic behavioral symptoms expressed by an organism in reponse to exposure to an oil or hazardous substance. The clinical behavioral signs of toxicity used shall be those that have been documented in published literature.

(B) *Avoidance.* Injury has occurred when a statistically significant difference can be measured in the frequency of avoidance behavior in population samples of fish placed in testing chambers with equal access to water containing oil or a hazardous substance and the control water. The oil or hazardous substance used in the test must be the exact substance or a substance that is reasonably comparable to that suspected to have caused avoidance to the natural populations of fish. This biological response may be used to confirm injury when oil or hazardous substances are suspected to have resulted in avoidance behavior in fish species.

(iv) *Category of injury—cancer.* One biological response for determining when cancer is a result of exposure to the discharge of oil or release of a hazardous substance has met the acceptance criteria.

(A) *Fish neoplasm.* Injury has occurred when a statistically significant difference can be measured in the frequency of occurrence of the fish neoplasia when comparing population samples from the assessment area and a control area. Neoplasms are characterized by relatively autonomous growth of abnormal cells that by proliferation infiltrate, press upon, or invade healthy tissue thereby causing destruction of cells, interference with physiological functions, or death of the organism. The following type of fish neoplasia may be used to determine injury: liver neoplasia and skin neoplasia. The neoplasms shall be confirmed by histological procedures and such confirmation procedures may also include special staining techniques for specific tissue components, ultra-structural examination using electron microscopy to identify cell origin, and to rule out or confirm viral, protozoan, or other causal agents. Fish neoplasm may be used to determine injury when oil or hazardous substances are suspected to have been the causal agent.

(v) *Category of injury—physiological malfunctions.* Five biological responses for determining when physiological malfunctions are a result of exposure to the discharge of oil or release of a hazardous substance have met the acceptance criteria.

(A) *Eggshell thinning.* Injury has occurred when eggshell thicknesses for samples for a population of a given species at the assessment area are thinner than those for samples from a population at a control area, or are at least 15 percent thinner than eggshells collected before 1946 from the same geographic area and stored in a museum. This biological response is a measure of avian eggshell thickness resulting from the adult bird having assimilated the oil or hazardous substance. This biological response may be used when the organochlorine pesticide DDT or its metabolites are suspected to have caused such physiological malfunction injury.

(B) *Reduced avian reproduction.* Injury has occurred when a statistically significant difference can be measured in the mean number of young fledged per active nest when comparing samples from populations in the assessment area and a control area. The fledging success (the number of healthy young leaving the nest) shall be used as the measurement of injury. Factors that may contribute to this measurement include egg fertility, hatching success, and survival of young. This biological response may be used when oil or hazardous substances are suspected to have reduced the nesting success of avian species.

(C) *Cholinesterase (ChE) enzyme inhibition.* Injury has occurred when brain ChE activity in a sample from the population at the assessment area shows a statistically significant inhibition when compared to the mean activity level in samples from populations in a control area. These enzymes are in the nervous systems of vertebrate organisms and the rate of ChE activity is associated with the regulation of nerve impulse transmission. This biological response may be used as a demonstration of physiological malfunction injury to birds, mammals, and reptiles when anti-ChE substances, such as organophosphorus and carbamate pesticides, have been discharged or released.

(D) *Delta-aminolevulinic acid dehydratase (ALAD) inhibition.* Injury has occurred when the activity level of whole blood ALAD in a sample from the population of a given species at an assessment area is significantly less than mean values for a population at a control area, and ALAD depression of at least 50 percent can be measured. The ALAD enzyme is associated with the formation of hemoglobin in blood and in chemical detoxification processes in the liver. This biological response is a measure of the rate of ALAD activity. This biological response may be used to determine injury to bird and mammal species that have been exposed to lead.

(E) *Reduced fish reproduction.* Injury has occurred when a statistically significant difference in reproduction success between the control organisms and the test organisms can be measured based on the use of published standardized laboratory toxicity testing methodologies. This biological response may be used when the oil or hazardous substance is suspected to have caused a reduction in the reproductive success of

fish species. Laboratory partial-chronic and laboratory chronic toxicity tests may be used. The oil or hazardous substance used in the test must be the exact substance or a substance that is reasonably comparable to that suspected to have caused reduced reproductive success in the natural population of fish.

(vi) *Category of injury—physical deformation.* Four biological responses for determining when physical deformations are a result of exposure to the discharge of oil or release of a hazardous substance have met the injury acceptance criteria.

(A) *Overt external malformations.* Injury has occurred when a statistically significant difference can be measured in the frequency of overt external malformation, such as small or missing eyes, when comparing samples from populations of wildlife species from the assessment area and a control area. This biological response may be used as a demonstration of injury when such physical deformations are observed in wildlife species exposed to oil or hazardous substances.

(B) *Skeletal deformities.* Injury has occurred when a statistically signficant difference can be measured in the frequency of skeletal deformities, such as defects in growth of bones, when comparing samples from populations of wildlife species from the assessment area and a control area. This biological response may be used as a demonstration of injury when such physical deformations are observed in wildlife species exposed to oil or hazardous substances.

(C) *Internal whole organ and soft tissue malformation.* Injury has occurred when a statistically signficant difference can be measured in the frequency of malformations to brain, heart, liver, kidney, and other organs, as well as soft tissues of the gastrointestinal tract and vascular system, when comparing samples from populations of wildlife species in the assessment area and a control area. This biological response may be used as a demonstration of injury when such physical deformations are observed in wildlife species exposed to oil or hazardous substances.

(D) *Histopathological lesions.* Injury has occurred when a statistically signficant difference can be measured in the frequency of tissue or cellular lesions when comparing samples from populations of wildlife species from the assessment area and a control area. This biological response may be used as a demonstration of injury when such physical deformations are observed in wildlife species exposed to oil or hazardous substances.

§ 11.63 Injury determination phase—pathway determination.

(a) *General.* (1) To determine the exposure pathways of the oil or hazardous substance, the following shall be considered:

(i) The chemical and physical characteristics of the discharged oil or released hazardous substance when transported by natural processes or while present in natural media;

(ii) The rate or mechanism of transport by natural processes of the discharged oil or released hazardous substance; and

(iii) Combinations of pathways that, when viewed together, may transport the discharged oil or released hazardous substance to the resource.

(2) The pathway may be determined by either demonstrating the presence of the oil or hazardous substance in sufficient concentrations in the pathway resource or by using a model that demonstrates that the conditions existed in the route and in the oil or hazardous substance such that the route served as the pathway.

(3) To the extent that the information needed to make this determination is not available, tests shall be conducted and necessary data shall be collected to meet the requirements of this section. Methods that may be used to conduct these additional tests and collect new information are described in § 11.64 of this part.

(b) *Surface water pathway.* (1) When the surface water resource is suspected as the pathway or a component of the pathway, the authorized official shall determine, using guidance provided in this paragraph, whether the surface water resource, either solely or in combination with other media, served as the exposure pathway for injury to the resource.

(2)(i) Using available information and such additional tests as necessary, it should be determined whether the surface water resource downstream or downcurrent of the source of discharge or release has been exposed to the oil or hazardous substance.

(ii) When the source of discharge or release is on an open water body, such as a marsh, pond, lake, reservoir, bay, estuary, gulf,or sound, it should be determined, using available information and such additional tests as necessary, whether the surface water resource in the vicinity of the source of discharge or release has been exposed to the oil or hazardous substance.

(3)(i) If a surface water resource is or likely has been exposed, the areal extent of the exposed surface water resource should be estimated, including delineation of:

(A) Channels and reaches:

(B) Seasonal boundaries of open water bodies; and

(C) Depth of exposed bed, bank, or shoreline sediments.

(ii) As appropriate to the exposed resource, the following should be determined:

(A) Hydraulic parameters and streamflow characteristics of channels and reaches;

(B) Bed sediment and suspended sediment characteristics, including grain size, grain mineralogy, and chemistry of grain surfaces;

(C) Volume, inflow-outflow rates, degree of stratification, bathymetry, and bottom sediment characteristics of surface water bodies;

(D) Suspended sediment concentrations and loads and bed forms and loads of streams and tidally affected waters; and

(E) Tidal flux, current direction, and current rate in coastal and marine waters.

(4)(i) Using available information and data from additional tests as necessary, the mobility of the oil or hazardous substance in the exposed surface water resource should be estimated. This estimate should consider such physical and chemical characteristics of the oil or hazardous substance as aqueous solubility, aqueous miscibility, density, volatility, potential for chemical degradation, chemical precipitation, biological degradation, biological uptake, and adsorption.

(ii) Previous studies of the characteristics discussed in paragraph (b)(4)(i) of this section should be relied upon if hydraulic, physical, and chemical conditions in the exposed surface water resource are similar to experimental conditions of the previous studies. In the absence of this information, those field and laboratory studies necessary to estimate the mobility of the oil or hazardous substance in surface water flow may be performed.

(5)(i) The rate of transport of the oil or hazardous substance in surface water should be estimated using available information and with consideration of the hydraulic properties of the exposed resource and the physical and chemical characteristics of the oil or hazardous substance.

(ii) Transport rates may be estimated using:

(A) The results of previous time-of-travel and dispersion studies made in the exposed surface water resource before the discharge or release;

(B) The results of previous studies, conducted with the same or similar chemical substances to those discharged or released under experimental conditions similar to the hydraulic, chemical, and biological conditions in the exposed surface water resource;

(C) The results of field measurements of time-of-travel and dispersion made in the exposed or comparable surface water resource, using natural or artificial substances with transport characteristics that reasonably approximate those of the oil or hazardous substance; and

(D) The results of simulation studies using the results of appropriate time-of-travel and dispersion studies in the exposed or comparable surface water resource.

(c) *Ground water pathway.* (1) When ground water resources are suspected as the pathway or a component of the pathway, the authorized official shall determine, using guidance provided in this paragraph, whether ground water resources, either solely or in combination with other media, served as the exposure pathway for injury to the resource.

(2) Using available information and such additional tests as necessary, it should be determined whether the unsaturated zone, the ground water, or the geologic materials beneath or downgradient of the source of discharge or release have been exposed to the oil or hazardous substance.

(3) If a ground water resource is or likely has been exposed, available information and such additional tests should be used as necessary to determine the characteristics of the unsaturated zone, as well as any aquifers and confining units containing the exposed ground water, in the vicinity of the source of discharge or release. The characteristics of concern include:

(i) Local geographical extent of aquifers and confining units;

(ii) Seasonal depth to saturated zone beneath the site;

(iii) Direction of ground water flow in aquifers;

(iv) Local variation in direction of ground water flow resulting from seasonal or pumpage effects;

(v) Elevation of top and bottom of aquifer and confining units;

(vi) Lithology, mineralogy, and porosity of rocks or sediments comprising the unsaturated zone, aquifers, and confining units;

(vii) Transmissivity and hydraulic conductivity of aquifers and confining units; and

(viii) Nature and amount of hydraulic connection between ground water and local surface water resources.

(4)(i) Using available information and such additional tests as necessary, the mobility of the oil or hazardous substance within the unsaturated zone and in the exposed ground water resources should be estimated. This estimate should consider local recharge rates and such physical and chemical characteristics of the oil or hazardous substance as aqueous solubility, aqueous miscibility, density, volatility, potential for chemical degradation, chemical precipitation, biological degradation, biological uptake, and adsorption onto solid phases in the unsaturated zone, aquifers, and confining units.

(ii) Previous studies of the characteristics discussed in paragraph (c)(4)(i) of this section should be relied upon if geohydrologic, physical, and chemical conditions in the exposed ground water resource are similar to experimental conditions of the previous studies. In the absence of this information, field and laboratory studies may be performed as necessary to estimate the mobility of the oil or hazardous substance within the unsaturated zone and in ground water flows.

(5)(i) The rate of transport of the oil or hazardous substance in ground water should be estimated using available information and with consideration of the site hydrology, geohydrologic properties of the exposed resource, and the physical and chemical characteristics of the oil or hazardous substance.

(ii) Transport rates may be estimated using:

(A) Results of previous studies conducted with the same or similar chemical substance, under experimental geohydrological, physical, and chemical conditions similar to the ground water resource exposed to the oil or hazardous substance;

(B) Results of field measurements that allow computation of arrival times of the discharged or released substance at downgradient wells, so that an empirical transport rate may be derived; or

(C) Results of simulation studies, including analog or numerical modeling of the ground water system.

(d) *Air pathway.* (1) When air resources are suspected as the pathway or a component of the pathway, the authorized official shall determine, using guidance provided in this paragraph, whether the air resources either solely or in combination with other media, served as the exposure pathway for injury to the resource.

(2) Using available information, air modeling, and additional field sampling and analysis, it should be determined whether air resources have been exposed to the discharge of oil or release of a hazardous substance.

(3)(i) If an air resource is or has likely been exposed, available information and such additional tests as necessary should be used to estimate the areal extent of exposure and the duration and frequency of exposure of such areas to emissions from the discharge of oil or release of a hazardous substance.

(ii) The areal extent of exposure is defined as the geographical surface area or space where emissions from the source of discharge or release are found or otherwise determined to be present for such duration and frequency as to potentially result in injury to resources present within the area or space.

(4) Previous studies of the characteristics discussed in paragraph (d)(3)(i) of this section should be relied upon if the conditions in the exposed air resource are similar to experimental conditions of the previous studies. In the absence of this information, air sampling and analysis methods identified in §11.64(d) of this part, air modeling methods, or a combination of these methods may be used in identifying the air exposure pathway and in estimating the areal extent of exposure and duration and frequency of exposure.

(5) For estimating the areal extent, duration, and frequency of exposure from the discharge or release, the following factors shall be considered as may be appropriate for each emissions event:

(i) The manner and nature in which the discharge or release occurs, including the duration of the emissions, amount of the discharge or release, and emergency or other time critical factors;

(ii) The configuration of the emitting source, including sources such as ponds, lagoons, pools, puddles, land and water surface spills, and venting from containers and vessels;

(iii) Physical and chemcial properties of substances discharged or released, including volatility, toxicity, solubility, and physical state;

(iv) The deposition from the air and re-emission to the air of gaseous and particulate emissions that provide periodic transport of the emissions; and

(v) Air transport and dispersion factors, including wind speed and direction, and atmospheric stability and temperature.

(e) *Geologic pathway.* (1) When geologic resources are suspected as the pathway or a component of the pathway, the authorized official shall determine, using guidance provided in this paragraph, whether geologic resources, either solely or in combination with other media, served as the exposure pathway for injury to the resource.

(2)(i) Using available information and the methods listed in §11.64(e) of this part, it should be determined whether any element of the geologic resource has been exposed to the oil or hazardous substance. If a geologic resource is or has likely been exposed, the areal extent of the exposed geologic resource, including the lateral and vertical extent of the dispersion, should be estimated.

(ii) To determine whether the unsaturated zone served as a pathway, the guidance provided in paragraph (c) of this section should be followed.

(f) *Biological pathway.* (1) When biological resources are suspected as the pathway or a component of the pathway, the authorized official shall determine, using the guidance provided in this paragraph, whether biological resources, either solely or in combination with other media, served as the exposure pathway for injury to the resource.

(2) Biological pathways that resulted from either direct or indirect exposure to the oil or hazardous substance, or from exposure to products of chemical or biological reactions initiated by the discharge or release shall be identified. Direct exposure can result from direct physical contact with the discharged oil or released hazardous substance. Indirect exposure can result from food chain processes.

(3) If the oil or hazardous substance adhered to, bound to, or otherwise covered surface tissue, or was ingested, or inhaled but not assimilated, the area of dispersion may be determined based upon chemical analysis of the appropriate tissues or organs (such as leaves, lungs, stomach, intestine, or their contents) that were directly exposed to the oil or hazardous substance.

(4) If the oil or hazardous substance was assimilated, the areal dispersion may be determined based upon one or more of the following alternative procedures:

(i) If direct exposure to the biological resource has occurred, chemical analysis of the organisms that have been exposed may be performed.

(ii) If indirect exposure to the biological resource has occurred, either chemical analysis of free-ranging biological resources using one or more indicator species as appropriate, or laboratory analysis of one or more in situ placed indicator species as appropriate may be performed.

(A) *Indicator species,* as used in this section, means a species of organism selected consistent with the following factors to represent a trophic level of a food chain:

(*1*) General availability of resident organisms in the assessment area;

(*2*) Potential for exposure to the oil or hazardous substance through ingestion, assimilation, or inhalation;

(*3*) Occurrence of the substance in a chemical form that can be assimilated by the organism;

(*4*) Capacity of the organism to assimilate, bioconcentrate, bioaccumulate, and/or biomagnify the substance;

(*5*) Capacity of the organism to metabolize the substance to a form that cannot be detected through available chemical analytical procedures; and

(*6*) Extent to which the organism is representative of the food chain of concern.

(B) Collection of the indicator species should be limited to the number necessary to define the areal dispersion and to provide sufficient sample volume for chemical analysis.

(C) When in situ procedures are used, indicator species that behave comparably to organisms existing under free-ranging conditions shall be collected. The indicator species used in this procedure shall be obtained either from a control area selected consistent with provisions of § 11.72 of this part or obtained from a suitable supply of wild-strain organisms reared in a laboratory setting. Appropriate chemical analysis shall be performed on a representative subsample of the indicator species before in situ placement.

(iii) In situ placement procedures shall be used where the collection of samples would be inconsistent with the provisions of § 11.17(b) of this part.

(5) Sampling sites and the number of replicate samples to be collected at the sampling sites shall be consistent with the quality assurance provisions of the Assessment Plan.

(6) Chemical analysis of biological resource samples collected for the purpose of this section shall be conducted in accordance with the quality assurance provisions of the Assessment Plan.

§ 11.64 Injury determination phase—testing and sampling methods.

(a) *General.* (1) The guidance provided in this section shall be followed for selecting methodologies for the Injury Determination phase.

(2) Before selecting methodologies, the objectives to be achieved by testing and sampling shall be defined. These objectives shall be listed in the Assessment Plan. In developing these objectives, the availability of information from response actions relating to the discharge or release, the resource exposed, the characteristics of the oil or hazardous substance, potential physical, chemical, or biological reactions initiated by the discharge or release, the potential injury, the pathway of exposure, and the potential for injury resulting from that pathway should be considered.

(3) When selecting testing and sampling methods, only those methodologies shall be selected:

(i) For which performance under conditions similar to those anticipated at the assessment area has been demonstrated;

(ii) That ensure testing and sampling performance will be cost-effective;

(iii) That will produce data that were previously unavailable and that are needed to make the determinations; and

(iv) That will provide data consistent with the data requirements of the Quantification phase.

(4) Specific factors that should be considered when selecting testing and sampling methodologies to meet the requirements in paragraph (a)(3) of this section include:

(i) Physical state of the discharged or released substance;

(ii) The duration, frequency, season, and time of the discharge or release;

(iii) The range of concentrations of chemical compounds to be analyzed in different media;

(iv) Detection limits, accuracy, precision, interferences, and time required to perform alternative methods;

(v) Potential safety hazards to obtain and test samples;

(vi) Costs of alternative methods; and

(vii) Specific guidance provided in paragraphs (b), (c), (d), (e), and (f) of this section.

(b) *Surface water resources.* (1) Testing and sampling for injury to surface water resources shall be performed using methodologies described in the Assessment Plan.

(2) Chemical analyses performed to meet the requirements of the Injury Determination phase for surface water resources shall be conducted in accordance with methods that are generally accepted or have been scientifically verified and documented.

(3) The term "water sample" shall denote a volume of water collected and preserved to represent the bulk water and any dissolved or suspended materials or microorganisms occurring in the surface water resource.

(4) Sampling of water and sediments from surface water resources shall be conducted according to generally accepted methods.

(5) Measurement of the hydrologic properties of the resource shall be conducted according to generally accepted methods.

(6)(i) Interpretation of surface-water flow or estimation of transport of oil or hazardous substance in surface water through the use of models shall be based on hydrologic literature and current practice.

(ii) The applicability of models used during the assessment should be demonstrated, including citation or description of the following:

(A) Physical, chemical, and biological processes simulated by the model;

(B) Mathematical or statistical methods used in the model; and

(C) Model computer code (if any), test cases proving the code works, and any alteration of previously documented code made to adapt the model to the assessment area.

(iii) The validity of models used during the assessment should be established, including a description of the following:

(A) Hydraulic geometry, physiographic features, and flow characteristics of modeled reaches or areas;

(B) Sources of hydrological, chemical, biological, and meteorological data used in the model;

(C) Lists or maps of data used to describe initial conditions;

(D) Time increments or time periods modeled;

(E) Comparison of predicted fluxes of water and solutes with measured fluxes;

(F) Calibration-verification procedures and results; and

(G) Types and results of sensitivity analyses made.

(c) *Ground water resources.* (1) Testing and sampling for injury to ground water resources shall be performed using methodologies described in the Assessment Plan.

(2) Chemical analyses performed to meet the requirements of the Injury Determination phase for ground water resources shall be conducted in accordance with methods that are generally accepted or have been scientifically verified and documented.

(3)(i) The term "water sample" shall denote a volume of water collected and preserved to represent the bulk water and any dissolved or suspended materials or microorganisms occurring in the ground water resource.

(ii) The source of ground water samples may be from natural springs, in seeps, or from wells constructed according to generally accepted methods.

(4) Sampling of ground water or of geologic materials through which the ground water migrates shall be conducted according to generally accepted methods.

(5) Measurement of the geohydrologic properties of the resource shall be conducted according to generally accepted practice.

(6) Description of lithologies, minerals, cements, or other sedimentary characteristics of the ground water resource should follow generally accepted methods.

(7) Interpretation of the geohydrological setting, including identifying geologic layers comprising aquifers and any confining units, shall be based on geohydrologic and geologic

literature and generally accepted practice.

(8)(i) Interpretation of ground-water flow systems or estimation of transport of oil or hazardous substances in ground water through the use of models shall be based on geohydrologic literature and current practice.

(ii) The applicability of models used during the assessment should be demonstrated, including citation or description of the following.

(A) Physical, chemical, and biological processes simulated by the model;

(B) Mathematical or statistical methods used in the model; and

(C) Model computer code (if any), test cases proving the code works, and any alteration of previously documented code made to adapt the model to the assessment area.

(iii) The validity of models used during the assessment should be established, including a description of the following:

(A) Model boundary conditions and stresses simulated;

(B) How the model approximates the geohydrological framework of the assessment area;

(C) Grid size and geometry;

(D) Sources of geohydrological, chemical, and biological data used in the model;

(E) Lists or maps of data used to describe initial conditions;

(F) Time increments or time periods modeled;

(G) Comparison of predicted fluxes of water and solutes with measured fluxes;

(H) Calibration-verification procedures and results; and

(I) Type and results of sensitivity analyses made.

(d) *Air resources.* (1) Testing and sampling for injury to air resources shall be performed using methodologies that meet the selection and documentation requirements in this paragraph. Methods identified in this section and methods meeting the selection requirements identified in this section shall be used to detect, identify, and determine the presence and source of emissions of oil or a hazardous substance, and the duration, frequency, period of exposure (day, night, seasonal, etc.), and levels of exposure.

(2) The sampling and analysis methods identified in this paragraph are the primary methods to be used for determining injury to the air resource. Air modeling methods may be used for injury determination only when air sampling and analysis methods are not available or the discharge or release occurred with no opportunity to monitor or sample the emissions.

(3)(i) Methods developed, evaluated, approved, and published by the U.S. Environmental Protection Agency may be used for sampling and analysis to determine injury to the air resource.

(ii) Methods selected for air sampling and analysis may include those methods that have been formally reviewed, evaluated, and published by the following government and professional organizations: the National Institute for Occupational Safety and Health, the American Society for Testing and Materials, and the American Public Health Association.

(iii) Methods selected for air sampling and analysis shall be methods that are documented for each of the following:

(A) The range of field conditions for which the methods are applicable;

(B) Quality assurance and quality control requirements necessary to achieve the data quality the methods are capable of producing;

(C) Operational costs of conducting the methods; and

(D) Time required to conduct the methods.

(iv) The determination of concentrations in excess of emission standards for hazardous air pollutants established under section 112 of the Clean Air Act, 42 U.S.C. 7412, shall be conducted in accordance with the primary methods or alternative methods as required in "National Emission Standards for Hazardous Air Pollutants: Source Test and Analytical Methods," 40 CFR 61.14, and as may be applicable to the determination of injury to air resources.

(4) In selecting methods for testing and sampling for injury to air resources, the following performance factors of the sampling and analysis methods and the influencing characteristics of the assessment area and the general vicinity shall be considered:

(i) Method detection limits, accuracy, precision, specificity, interferences, and analysis of time and cost;

(ii) Sampling area locations and frequency, duration of sampling, and chemical stability of emissions; and

(iii) Meteorological parameters that influence the transport of emissions and the spatial and temporal variation in concentration.

(e) *Geologic resources.* (1) Testing and sampling for injury to geologic resources shall be performed using methodologies described in this paragraph.

(2) Testing pH level in soils shall be performed using standard pH measurement techniques, taking into account the nature and type of organic and inorganic constituents that contribute to soil acidity; the soil/solution ratio; salt or electrolytic content; the carbon dioxide content; and errors associated with equipment standardization and liquid junction potentials.

(3) Salinity shall be tested by measuring the electrical conductivity of the saturation extraction of the soil.

(4) Soil microbial respiration shall be tested by measuring uptake of oxygen or release of carbon dioxide by bacterial, fungal, algal, and protozoan cells in the soil. These tests may be made in the laboratory or in situ.

(5) Microbial populations shall be tested using microscopic counting, soil fumigation, glucose response, or adenylate enegry charge.

(6) Phytotoxicity shall be tested by conducting tests of seed germination, seedling growth, root elongation, plant uptake, or soil-core microcosms.

(7) Injury to mineral resources shall be determined by describing restrictions on access, development, or use of the resource as a result of the oil or hazardous substance. Any appropriate health and safety considerations that led to the restrictions should be documented.

(f) *Biological resources.* (1) Testing and sampling for injury to biological resources shall be performed using methodologies provided for in this paragraph.

(2)(i) Testing may be performed for biological responses that have satisfied the acceptance criteria of §11.62(f)(2) of this part.

(ii) Testing methodologies that have been documented and are applicable to the biological response being tested may be used.

(3) Injury to biological resources, as such injury is defined in §11.62(f)(1)(ii) of this part, may be determined by using methods acceptable to or used by the Food and Drug Administration or the appropriate State health agency in determining the levels defined in that paragraph.

§11.70 Quantification phase—general.

(a) *Requirement.* (1) Upon completing the Injury Determination phase, the authorized official shall quantify for each resource determined to be injured and for which damages will be sought, the effect of the discharge or release in terms of the reduction from the baseline condition in the quantity and quality of services, as the phrase is used in this part, provided by the injured resource using the guidance provided in the Quantification phase of this part.

(2) The Quantification phase consists of §11.70—general; §11.71—service reduction quantification; §11.72—baseline services determination; and §11.73—resource recoverability analysis, of this part.

(b) *Purpose.* The purpose of the Quantification phase is to quantify the effects of the discharge or release on the injured natural resources for use in determining the appropriate amount of compensation.

(c) *Steps in the Quantification phase.* In the Quantification phase, the extent of the injury shall be measured, the baseline condition of the injured resource shall be estimated, the baseline services shall be identified, the recoverability of the injured resource shall be determined, and the reduction in services that resulted from the discharge or release shall be estimated.

(d) *Completion of Quantification phase.* Upon completing the Quantification phase, the authorized official shall make a determination as to the reduction in services that resulted from the discharge or release. This Quantification Determination shall be used in the Damage Determination phase and shall be maintained as part of the Report of

Assessment described in § 11.90 of this part.

§ 11.71 Quantification phase—service reduction quantification.

(a) *Requirements.* (1) The authorized official shall quantify the effects of a discharge of oil or release of a hazardous substance by determining the extent to which natural resource services have been reduced as a result of the injuries determined in the Injury Determination phase of the assessment.

(2) This determination of the reduction in services will be used in the Damage Determination phase of the assessment.

(3) Quantification will be done only for resources for which damages will be sought.

(b) *Steps.* Except as provided in § 11.71(f) of this part, the following steps are necessary to quantify the effects:

(1) Measure the extent to which the injury demonstrated in the Injury Determination phase has occurred in the assessment area;

(2) Measure the extent to which the injured resource differs from baseline conditions, as described in § 11.72 of this part, to determine the change attributable to the discharge or release;

(3) Determine the services normally produced by the injured resource, which are considered the baseline services or the without-a-discharge-or-release condition as described in § 11.72 of this part;

(4) Identify interdependent services to avoid double counting in the Damage Determination phase and to discover significant secondary services that may have been disrupted by the injury; and

(5) Measure the disruption of services resulting from the discharge or release, which is considered the change in services or the with-a-discharge-or-release condition.

(c) *Contents of the quantification.* The following factors should be included in the quantification of the effects of the discharge or release on the injured resource:

(1) Total area, volume, or numbers affected of the resource in question;

(2) Degree to which the resource is affected, including consideration of subunits or subareas of the resource, as appropriate;

(3) Ability of the resource to recover, expressed as the time required for restoration of baseline services as described in § 11.73 of this part;

(4) Proportion of the available resource affected in the area;

(5) Services normally provided by the resource that have been reduced as a result of the discharge or release; and

(6) Factors identified in the specific guidance in paragraphs (h), (i), (j), (k), and (l) of this section dealing with the different kinds of natural resources.

(d) *Selection of resources, services, and methodologies.* Specific resources or services to quantify and the methodology for doing so should be selected based upon the following factors:

(1) Degree to which a particular resource or service is affected by the discharge or release;

(2) Degree to which a given resource or service can be used to represent a broad range of related resources or services;

(3) Consistency of the measurement with the requirements of the economic methodology to be used;

(4) Technical feasibility, as that phrase is used in this part, of quantifying changes in a given resource or service at reasonable cost; and

(5) Preliminary estimates of services at the assessment area and control area based on resource inventory techniques.

(e) *Services.* In quantifying changes in natural resource services, the functions provided in the cases of both with- and without-a-discharge-or-release shall be compared. For the purposes of this part, services include provision of habitat, food and other needs of biological resources, recreation, other products or services used by humans, flood control, ground water recharge, waste assimilation, and other such functions that may be provided by natural resources.

(f) *Direct quantification of services.* The effects of a discharge or release on a resource may be quantified by directly measuring changes in services provided by vhe resource, instead of quantifying the changes in the resource itself, when

it is determined that all of the following conditions are met:

(1) The change in the services from baseline can be demonstrated to have resulted from the injury to the natural resource;

(2) The extent of change in the services resulting from the injury can be measured without also calculating the extent of change in the resource; and

(3) The services to be measured are anticipated to provide a better indication of damages caused by the injury than would direct quantification of the injury itself.

(g) *Statutory exclusions.* In quantifying the effects of the injury, the following statutory exclusions shall be considered, as provided in sections 107 (f), (i), and (j) and 114(c) of CERCLA, that exclude compensation for damages to natural resources that were a result of:

(1) An irreversible and irretrievable commitment of natural resources identified in an environmental impact statement or other comparable environmental analysis, and the decision to grant the permit or license authorizes such a commitment, and the facility was otherwise operating within the terms of its permit or license, so long as, in the case of damages to an Indian tribe occurring pursuant to a Federal permit or license, the issuance of that license or permit was not inconsistent with the fiduciary duty of the United States with respect to such Indian tribe; or

(2) The damages and the release of a hazardous substance from which such damages resulted have occurred wholly before the enactment of CERCLA; or

(3) The application of a pesticide product registered under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 135–135k; or

(4) Any other federally permitted release, as defined in secton 101(10) of CERCLA; or

(5) Resulting from the release or threatened release of recycled oil from a service station dealer as described in section 107(a) (3) or (4) of CERCLA if such recycled oil is not mixed with any other hazardous substance and is stored, treated, transported or otherwise managed in compliance with regulations or standards promulgated pursuant to section 3014 of the Solid Waste Disposal Act and other applicable authorities.

(h) *Surface water resources.* (1) The area where the injured surface water resource differs from baseline shall be determined by determining the areal extent of oil or hazardous substances in the water or on the sediments.

(2)(i) Areal variation in concentrations of the discharged or released substances dissolved in or floating on water, adhering to suspended sediments, or adhering to bed, bank, or shoreline sediments from exposed areas should be determined in sufficient detail to approximately map the boundary separating areas with concentrations above baseline from areas with concentrations equal to or less than baseline.

(ii) The size, shape, and location of the plume may be estimated using time of travel and dispersion data obtained under § 11.63 of this part, since plumes of dissolved or floating substances may be rapidly transported and dispersed in surface water.

(3) Water and sediment samples may be collected and chemically analyzed and stage, water discharge, or tidal flux measurements made, as appropriate, to collect new data required by this section.

(4)(i) Within the area determined in paragraph (h)(2) of this section to be above baseline, the services provided by the surface water or sediments that are affected should be determined. This determination may include computation of volumes of water or sediments affected, total areas of water or sediment affected, volume of water used from the affected surface water resource, or other appropriate measures.

(ii) The services should be determined with consideration of potential effects on downstream or downcurrent resources during the recovery period, as determined in § 11.73 of this part, resulting from transport of dissolved substances and of substances adhering to sediments.

(i) *Ground water resources.* (1) The area where the injured ground water resource differs from baseline should be determined by determining the areal extent of oil or hazardous substances in

water or geologic materials in the unsaturated zone and identified geohydrological units, which are aquifers or confining layers, within the assessment area.

(2)(i) The lateral and vertical extent of discharged or released substances in the unsaturated zone, if it is known to be exposed, should be determined.

(ii) The lateral and vertical extent of plumes within geohydrologic units known to be exposed should be determined. Concentrations of substances within and adjacent to each plume should be determined in sufficient detail to approximately locate the boundary separating areas with concentrations above baseline from areas with concentrations equal to or less than baseline.

(3) Water or geologic materials may be sampled and chemically analyzed, or surface-geophysical techniques may be used for collecting new data required by this section. General verification of the plume boundaries by chemical analysis of selected water samples should be done if boundary locations are initially determined by surface-geophysical measurements.

(4)(i) Within the area determined in paragraph (i)(2)(ii) of this section to be above baseline, the services provided by the ground water that is affected should be determined. This determination may include computation of the volume of water affected, volume of affected ground water pumped from wells, volume of affected ground water discharged to streams or lakes, or other appropriate measures.

(ii) The services should be determined with consideration of potential enlargement of the plume during the recovery period, as determined in § 11.73 of this part, resulting from ground water transport of the substances.

(iii) The effects on the ground water resource during the recovery period resulting from potential remobilization of discharged or released substances that may be adhering, coating, or otherwise bonding to geologic materials should be considered.

(j) *Air resources.* The area where the injured air resource differs from baseline should be determined by determining the geographical area affected, the degree of impairment of services, and the period of time impairment occurred.

(k) *Geologic resources.* The area where the injured geologic resource differs from baseline should be determined by determining:

(1) The surface area of soil with reduced ability to sustain the growth of vegetation from the baseline level;

(2) The surface area or volume of soil with reduced suitability as habitat for biota from the baseline level;

(3) The volume of geologic resources that may act as a source of toxic leachate;

(4) The tonnage of mineral resources whose access, development, or use is restricted as a result of the discharge or release.

(l) *Biological resources.* (1) The extent to which the injured biological resource differs from baseline should be determined by analysis of the population or the habitat or ecosystem levels. Although it may be necessary to measure populations to determine changes in the habitats or ecosystems, and vice versa, the final result should be expressed as either a population change or a habitat or ecosystem change in order to prevent double counting in the economic analysis. This separation may be ignored only for resources that do not interact significantly and where it can be demonstrated that double counting is being avoided.

(2) Analysis of population changes or habitat or ecosystem changes should be based upon species, habitats, or ecosystems that have been selected from one or more of the following categories:

(i) Species or habitats that can represent broad components of the ecosystem, either as representatives of a particular ecological type, of a particular food chain, or of a particular service;

(ii) Species, habitats, or ecosystems that are especially sensitive to the oil or hazardous substance and the recovery of which will provide a useful indicator of successful restoration; or

(iii) Species, habitats, or ecosystems that provide especially significant services.

(3) Analysis of populations, habitats, or ecosystems shall be limited to those

populations, habitats, or ecosystems for which injury has been determined in the Injury Determination phase or those that can be linked directly through services to resources for which injury has been so determined. Documentation of the service link to the injured resource must be provided in the latter case.

(4) Population, habitat, or ecosystem measurement methods that provide data that can be interpreted in terms of services must be selected. To meet this requirement, a method should:

(i) Provide numerical data that will allow comparison between the assessment area data and the control area or baseline data;

(ii) Provide data that will be useful in planning efforts for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources, and in later measuring the success of those efforts, and, where relevant, will allow calculation of compensable value; and

(iii) Allow correction, as applicable, for factors such as dispersal of organisms in or out of the assessment area, differential susceptibility of different age classes of organisms to the analysis methods and other potential systematic biases in the data collection.

(5) When estimating population differences of animals, standard and widely accepted techniques, such as census, mark-recapture, density, and index methods, and other estimation techniques appropriate to the species and habitat shall be used. Frequencies of injury observed in the population shall be measured as applicable.

(i) In general, methods used for estimates of wildlife populations should follow standard and widely accepted techniques such as those recommendations provided in the "Wildlife Management Techniques Manual" (4th edition, Wildlife Society, 1980, available from the Wildlife Society, 5410 Grosvenor Lane, Bethesda, MD 20814), including references cited and recommended in that manual. The specific technique used need not be cited in that manual, but should meet its recommendations for producing reliable estimates or indices.

(ii) Measurement of age structures, life table statistics, or age structure models generally will not provide satisfactory measurement of changes due to a discharge of oil or release of a hazardous substance unless there is clear evidence that the oil or hazardous substance has differentially affected different age classes and there are reliable baseline age structure data available for the population being assessed.

(iii) Mortality from single incidents may be used to estimate changes in populations only when there are available baseline population data for the area, so that the proportion lost can be estimated, and when corrections can be made for potential sampling biases, such as natural mortality and factors influencing distribution of carcasses and ability of investigators to find them. Specific techniques for measuring mortality include the following:

(A) Fish mortality in freshwater areas may be estimated from counts of carcasses, using methods and guidelines for estimating numbers of fish killed contained in Part II (Fish-Kill Counting Guidelines) of the "Monetary Values of Freshwater Fish and Fish-Kill Counting Guidlines," American Fisheries Society Special Publication Number 13, 1982 (incorporation by reference, see § 11.18), including use of appropriate random sampling methods and tagged carcasses as identified and discussed in Part II of that publication.

(B) The authorized official may adapt the techniques discussed in paragraph (l) (5) (iii) (A) of this section for counting dead aquatic birds or for counting marine or estuarine fish or birds. Such adaptation will require the documentation of the methods used to avoid sampling biases.

(C) Fish mortality may also be estimated by use of an in situ bioassay technique that is similar to that identified in § 11.62(f)(4)(i)(C) of this part, if the oil or hazardous substance is still present at levels that resulted in injury and if appropriate instream controls can be maintained at control areas.

(6) Plant populations may be measured using standard techniques, such as population density, species composition, diversity, dispersion, and cover,

(7) Forest and range resources may be estimated by standard forestry and range management evaluation techniques.

(8) Habitat quality may be measured using techniques such as the Habitat Evaluation Procedures (HEP) developed and used by the U.S. Fish and Wildlife Service.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5175, Feb. 22, 1988; 59 FR 14283, Mar. 25, 1994]

§ 11.72 Quantification phase—baseline services determination.

(a) *Requirements.* The authorized official shall determine the physical, chemical, and biological baseline conditions and the associated baseline services for injured resources at the assessment area to compare that baseline with conditions found in § 11.71 of this part.

(b) *General guidelines.* Baseline data shall be selected according to the following general guidelines:

(1) Baseline data should reflect conditions that would have been expected at the assessment area had the discharge of oil or release of hazardous substances not occurred, taking into account both natural processes and those that are the result of human activities.

(2) Baseline data should include the normal range of physical, chemical, or biological conditions for the assessment area or injured resource, as appropriate for use in the analysis in § 11.71 of this part, with statistical descriptions of that variability. Causes of extreme or unusual value in baseline data should be identified and described.

(3) Baseline data should be as accurate, precise, complete, and representative of the resource as the data used or obtained in § 11.71 of this part. Data used for both the baseline and services reduction determinations must be collected by comparable methods. When the same method is not used, comparability of the data collection methods must be demonstrated.

(4) Baseline data collection shall be restricted to those data necessary for conducting the assessment at a reasonable cost. In particular, data collected should focus on parameters that are directly related to the injuries quantified in § 11.71 of this part and to data appropriate and necessary for the Damage Determination phase.

(5) The authorized official may use or authorize for use baseline data that are not expected to represent fully the baseline conditions, subject to the following requirements:

(i) The authorized official shall document how the requirements of this paragraph are met:

(ii) These substitute baseline data shall not cause the difference between baseline and the conditions in the assessment area to exceed the difference that would be expected if the baseline were completely measured; and

(iii) The authorized official has determined that it is either not technically feasible or not cost-effective, as those phrases are used in this part, to measure the baseline conditions fully and that these baseline data are as close to the actual baseline conditions as can be obtained subject to these limitations.

(c) *Historical data.* If available and applicable, historical data for the assessment area or injured resource should be used to establish the baseline. If a significant length of time has elapsed since the discharge or release first occurred, adjustments should be made to historical data to account for changes that have occurred as a result of causes other than the discharge or release. In addition to specialized sources identified in paragraphs (g) through (k) of this section, one or more of the following general sources of historical baseline data may be used:

(1) Environmental Impact Statements or Environmental Assessments previously prepared for purposes of the National Environmental Policy Act (NEPA), 42 U.S.C. 4321–4361, similar documents prepared under other Federal and State laws, and background studies done for any of these documents;

(2) Standard scientific and management literature sources appropriate to the resource;

(3) Computerized data bases for the resource in question;

(4) Public or private landholders in the assessment area or in neighboring areas;

(5) Studies conducted or sponsored by natural resource trustees for the resource in question;

(6) Federally sponsored research identified by the National Technical Information Service;

(7) Studies carried out by educational institutions; and

(8) Other similar sources of data.

(d) *Control areas.* Where historical data are not available for the assessment area or injured resource, or do not meet the requirements of this section, baseline data should be collected from control areas. Historical data for a control area should be used if available and if they meet the guidelines of this section. Otherwise, the baseline shall be defined by field data from the control area. Control areas shall be selected according to the following guidelines, and both field and historical data for those areas should also conform to these guidelines:

(1) One or more control areas shall be selected based upon their similarity to the assessment area and lack of exposure to the discharge or release;

(2) Where the discharge or release occurs in a medium flowing in a single direction, such as a river or stream, at least one control area upstream or upcurrent of the assessment area shall be included, unless local conditions indicate such an area is inapplicable as a control area;

(3) The comparability of each control area to the assessment area shall be demonstrated, to the extent technically feasible, as that phrase is used in this part;

(4) Data shall be collected from the control area over a period sufficient to estimate normal variability in the characteristics being measured and should represent at least one full cycle normally expected in that resource;

(5) Methods used to collect data at the control area shall be comparable to those used at the assessment area, and shall be subject to the quality assurance provisions of the Assessment Plan;

(6) Data collected at the control area should be compared to values reported in the scientific or management literature for similar resources to demonstrate that the data represent a normal range of conditions; and

(7) A control area may be used for determining the baseline for more than one kind of resource, if sampling and data collection for each resource do not interfere with sampling and data collection for the other resources.

(e) *Baseline services.* The baseline services associated with the physical, chemical, or biological baseline data shall be determined.

(f) *Other requirements.* The methodologies in paragraphs (g) through (k) of this section shall be used for determining baseline conditions for specific resources in addition to following the general guidelines identified in paragraphs (a) through (e) of this section. If a particular resource is not being assessed for the purpose of the Damage Determination phase, and data on that resource are not needed for the assessment of other resources, baseline data for the resource shall not be collected.

(g) *Surface water resources.* (1) This paragraph provides additional guidance on determining baseline services for surface water resources. The general guidance provided in paragraphs (a) through (f) of this section should be followed before beginning any work described in this paragraph.

(2) Applicable and available historical data shall be gathered to determine baseline conditions for the surface water resource at the assessment area. If deemed inadequate for determining baseline conditions, such data shall be used to the extent technically feasible, as that phrase is used in this part, in designating the control areas described in paragraph (g)(3) of this section for the surface water resource determined to be injured.

(3) Control areas shall be selected for the surface water resource subject to the general criteria in paragraph (d) of this section and additional criteria as follows:

(i) For each injured stream or river reach, a control area shall be designated consisting of a stream or river reach of similar size, that is as near to the assessment area as practical and, if practical, that is upstream or upcurrent from the injured resource, such that the channel characteristics, sediment characteristics, and streamflow characteristics are similar to the injured resource and the water and sediments of the control area, because of location, have not been exposed to the discharge or release.

(ii) For each injured standing water body, such as a marsh, pond, lake, bay,

or estuary, a control area shall be designated consisting of a standing water body of similar size that is as near to the assessment area as practical, such that the sediment characteristics and inflow-outflow characteristics of the control area are similar to the injured resource and the water and sediments of the control area, because of location, have not been exposed to the discharge or release.

(4)(i) Within the control area locations shall be designated for obtaining samples of water and sediments.

(ii) The water discharge, stage, or tidal flux shall be measured and representative water and sediments collected as follows:

(A) Measure stage, water discharge, and tidal flux as appropriate at the same time that water and sediment samples are collected; and

(B) Obtain comparable samples and measurements at both the control and assessment areas under similar hydraulic conditions.

(iii) Measurement and samples shall be obtained as described in this paragraph in numbers sufficient to determine:

(A) The approximate range of concentration of the substances in water and sediments;

(B) The variability of concentration of the substances in water and sediments during different conditions of stage, water discharge, or tidal flux; and

(C) The variability of physical and chemical conditions during different conditions of stage, water discharge, or tidal flux relating to the transport or storage of the substances in water and sediments.

(5) Samples should be analyzed from the control area to determine the physical properties of the water and sediments, suspended sediment concentrations in the water, and concentrations of oil or hazardous substances in water or in the sediments. Additional chemical, physical, or biological tests may be made, if necessary, to obtain otherwise unavailable data for the characteristics of the resource and comparison with the injured resource at the assessment area.

(6) In order to establish that differences between surface water conditions of the control and assessment areas are statistically significant, the median and interquartile range of the available data or the test results should be compared using the Mann-Whitney and ranked squares tests, respectively.

(7) Additional tests may be made of samples from the control area, if necessary, to provide otherwise unavailable information about physical, chemical, or biochemical processes occurring in the water or sediments relating to the ability of the injured surface water resource to recover naturally.

(h) *Ground water resources.* (1) This paragraph provides additional guidance on determining baseline services for ground water resources. The general guidance provided in paragraphs (a) through (f) of this section should be followed before beginning any work described in this paragraph.

(2) Applicable and available historical data shall be gathered to determine baseline conditions for the ground water resource at the assessment area. If deemed inadequate for determining baseline conditions, such data shall be used to the extent technically feasible, as that phrase is used in this part, in designating the control areas described in paragraph (h)(3) of this section for the ground water resource determined to be injured.

(3) A control area shall be designated subject to the general criteria in paragraph (d) of this section and as near to the assessment area as practical, such that, within the control area, geological materials, geohydrological units, and hydrologic conditions are similar to the assessment area, and ground water resources are not exposed to substances from the discharge or release.

(4) Within the control area, wells shall be identified or drilled, designated as control wells, to obtain representative ground water samples for analysis. The location, depth, and number of control wells and the number of ground water samples collected should be sufficient to estimate the vertical and lateral variation in concentration of the substances in both the unsaturated zone and in ground water from geohydrologic units similar to units tested in the assessment area.

(i) Representative water samples from each control well shall be collected and analyzed. The analyses should determine the physical and chemical properties of the ground water relating to the occurrence of oil or hazardous substances.

(ii) If the oil or hazardous substances are commonly more concentrated on geologic materials than in ground water, representative samples of geologic materials from aquifers and the unsaturated zone as appropriate should be obtained and chemically analyzed. The location, depth, and number of these samples should be sufficient to determine the vertical and lateral variation in concentration of the oil or hazardous substances absorbing or otherwise coating geologic materials in the control area. These samples may also be analyzed to determine porosity, mineralogy, and lithology of geologic materials if these tests will provide otherwise unavailable information on storage or mobility of the oil or hazardous substances in the ground water resource.

(5) In order to establish that differences between ground water conditions of the control and assessment areas are statistically significant, the median and interquartile range of available data or the test results from similar geohydrologic units should be compared using the Mann-Whitney and ranked squares test, respectively.

(6) Additional tests may be made of samples from the control area, if necessary, to provide otherwise unavailable information about chemical, geochemical, or biological processes occurring in the ground relating to the ability of the injured ground water resource to recover naturally.

(i) *Air resources.* (1) This paragraph provides additional guidance on determining baseline services for air resources. The general guidance provided in paragraphs (a) through (f) of this section should be followed before beginning any work described in this paragraph.

(2) Applicable and available historical data shall be gathered on ambient air quality and source emissions to determine baseline conditions for the air resource. These historical data may be used to determine baseline conditions if the data satisfy the general guidelines in paragraph (d) of this section and if all the following criteria are met:

(i) The methodology used to obtain these historical data would detect the oil or hazardous substance at levels appropriate for comparison to the concentrations measured in §11.71 of this part;

(ii) The effect of known or likely emission sources near the assessment area other than the source of the discharge or release can be identified or accounted for in the historical data; and

(iii) The historical data show that normal concentrations of the oil or hazardous substance are sufficiently predictable that changes as a result of the discharge or release are likely to be detectable.

(3) If historical data appropriate to determine baseline conditions at the assessment area are lacking, one or more control areas, as needed, shall be designated subject to the general criteria of paragraph (d) of this section and the following additional factors, which shall also be considered in establishing a monitoring schedule;

(i) Applicable and available historical data shall be used to the extent technically feasible, as that phrase is used in this part, in designating control areas or, lacking historical data, the factors in paragraph (i)(3)(iii) of this section shall be considered;

(ii) Control areas shall be spatially representative of the range of air quality and meteorological conditions likely to have occurred at the assessment area during the discharge or release into the atmosphere; and

(iii) The following additional factors shall be considered:

(A) The nature of the discharge or release and of potential alternative sources of the oil or hazardous substance, including such factors as existing sources, new sources, intermittent sources, mobile sources, exceptional events, trends, cycles, and the nature of the material discharged or released;

(B) Environmental conditions affecting transport, such as wind speed and direction, atmospheric stability, temperature, humidity, solar radiation intensity, and cloud cover; and

(C) Other factors, such as timing of the discharge or release, use patterns of the affected area, and the nature of the injury resulting from the discharge or release.

(4)(i) The preferred measurement method is to measure air concentrations of the oil or hazardous substance directly using the same methodology employed in § 11.71 of this part.

(ii) Nonspecific or chemical compound class methodologies may be used to determine baseline generically only in situations where it can be demonstrated that measuring indicator substances will adequately represent air concentrations of other components in a complex mixture.

(j) *Geologic resources.* (1) This paragraph provides additional guidance on determining baseline services for geologic resources. The general guidance provided in paragraphs (a) through (f) of this section should be followed before beginning any work described in this paragraph.

(2) Applicable and available historical data shall be gathered to determine baseline conditions for the geologic resource at the assessment area. If deemed inadequate for determining baseline conditions, such data shall be used to the extent technically feasible, as that phrase is used in this part, in designating the control areas described in paragraph (j)(3) of this section for the geologic resource determined to be injured.

(3) Control areas shall be selected for geologic resources subject to the general criteria in paragraph (d) of this section and additional criteria as follows:

(i) Similarity of exposed soil or geologic material in the assessment area with the geologic resource in the control area should be the primary factor in selecting the control area. Other factors, including climate, depth of ground water, vegetation type and area covered, land slope and land area, and hydraulic gradients and spatial relation to source should be comparable to the assessment area.

(ii) The control area shall be selected such that the geologic resource in the control area is not exposed to the discharge or release.

(4)(i) A sufficient number of samples from unbiased, randomly selected locations in the control area shall be obtained in order to characterize the areal variability of the parameters measured. Each sample should be analyzed to determine the physical and chemical properties of the geologic materials relating to the occurrence of the oil or hazardous substance. Additional chemical, physical, or biological tests may be made, if necessary, to obtain otherwise unavailable data for the characterization and comparison with the injured resource at the assessment area.

(ii) The mean and standard deviation of each parameter measured shall be used as the basis of comparison between the assessment and control areas.

(k) *Biological resources.* (1) This paragraph provides additional guidance on determining baseline services for biological resources. The general guidance provided in paragraphs (a) through (f) of this section should be followed before beginning any work described in this paragraph.

(2) Applicable and available historical data shall be gathered to determine baseline conditions for the biological resource at the assessment area and should include both population and habitat data if available. These data may be derived from the data sources identified in paragraph (c) of this section, as well as from the following:

(i) Aerial photographs or maps showing distribution and extent of habitat types or other biological resources before the discharge or release;

(ii) Biological specimens in systematic museum or herbarium collections and associated records, including labels and collectors' field notes; and

(iii) Photographs showing the nature of the habitat before the discharge or release when the location and date are well documented.

(3)(i) Control areas shall be selected for biological resources subject to the general criteria in paragraph (d) of this section and additional criteria as follows:

(A) The control area shall be comparable to the habitat or ecosystem at the assessment area in terms of distribution, type, species composition,

plant cover, vegetative types, quantity, and relationship to other habitats;

(B) Physical characteristics of the control and assessment areas shall be similar; and

(C) If more than one habitat or ecosystem type is to be assessed, comparable control areas should be established for each, or a control area should be selected containing those habitat types in a comparable distribution.

(ii) To the extent they are available, historical data should be gathered and used for the control area. Lacking adequate historical data for both the control and assessment areas, the control areas shall be used for the following purposes, as appropriate to the quantification:

(A) To measure baseline biota population levels or habitat or ecosystem quality, as discussed in §11.71(l) of this part; and

(B) To measure the natural frequency, if any, of the injury being assessed in unaffected populations or to demonstrate the lack of that injury in unaffected populations if these have not been done for purposes of the Injury Determination, and if needed for purposes of the Quantification.

(4) In addition, a control area should be used to collect control specimens, as needed, for the Injury Determination procedures.

(5) The identity of species for which Damage Determinations will be made or that play an important role in the assessment shall be confirmed except in the case where collecting the specimens of a species is likely to compromise the restoration of the species. One or more of the following methods shall be used:

(i) Specimens of the species shall be provided to an independent taxonomist or systematic biologist, who has access to a major systematic biology collection for that taxon, and who shall provide written confirmation of their identity to the species level;

(ii) A reference collection of specimens of the species, prepared and preserved in a way standard for systematic collections for that taxon, shall be maintained at least through final resolution of the damage action at which time it should be transferred to a major systematic biology collection; or

(iii) In the case of a species where collecting specimens is likely to compromise the recovery or restoration of that species population, the authorized official shall determine and use an alternative method for confirming species identity that will be consistent with established management goals for that species.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5175, Feb. 22, 1988; 59 FR 14283, Mar. 25, 1994]

§11.73 Quantification phase—resource recoverability analysis.

(a) *Requirement.* The time needed for the injured resources to recover to the state that the authorized official determines services are restored, rehabilitated, replaced, and/or the equivalent have been acquired to baseline levels shall be estimated. The time estimated for recovery or any lesser period of time as determined in the Assessment Plan must be used as the recovery period for purposes of §11.38 and the Damage Determination phase, §§11.80 through 11.84.

(1) In all cases, the amount of time needed for recovery if no restoration, rehabilitation, replacement, and/or acquisition of equivalent resources efforts are undertaken beyond response actions performed or anticipated shall be estimated. This time period shall be used as the "No Action-Natural Recovery" period for purposes of §11.82 and §11.84(g)(2)(ii) of this part.

(2) The estimated time for recovery shall be included in possible alternatives for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources, as developed in §11.82 of this part, and the data and process by which these recovery times were estimated shall be documented.

(b) *Restoration not feasible.* If the authorized official determines that restoration will not be technically feasible, as that phrase is used in this part, the reasoning and data on which this decision is based shall be documented as part of the justification for any replacement alternatives that may be considered or proposed.

(c) *Estimating recovery time.* (1) The time estimates required in paragraph

(a) of this section shall be based on the best available information and where appropriate may be based on cost-effective models. Information gathered may come from one or more of the following sources, as applicable:

(i) Published studies on the same or similar resources;

(ii) Other data sources identified in §11.72 of this part;

(iii) Experience of managers or resource specialists with the injured resource;

(iv) Experience of managers or resource specialists who have dealt with restoration for similar discharges or releases elsewhere; and

(v) Field and laboratory data from assessment and control areas as necessary.

(2) The following factors should be considered when estimating recovery times:

(i) Ecological succession patterns in the area;

(ii) Growth or reproductive patterns, life cycles, and ecological requirements of biological species involved, including their reaction or tolerance to the oil or hazardous substance involved;

(iii) Bioaccumulation and extent of oil or hazardous substances in the food chain;

(iv) Chemical, physical, and biological removal rates of the oil or hazardous substance from the media involved, especially as related to the local conditions, as well as the nature of any potential degradation or decomposition products from the process including:

(A) Dispersion, dilution, and volatilization rates in air, sediments, water, or geologic materials;

(B) Transport rates in air, soil, water, and sediments;

(C) Biological degradation, depuration, or decomposition rates and residence times in living materials;

(D) Soil or sediment properties and adsorption-desorption rates between soil or sediment components and water or air;

(E) Soil surface runoff, leaching, and weathering processes; and

(F) Local weather or climatological conditions that may affect recovery rates.

[51 FR 27725, Aug. 1, 1986, as amended at 59 FR 14283, Mar. 25, 1994; 61 FR 20612, May 7, 1996]

§11.80 Damage determination phase—general.

(a) *Requirement.* (1) The authorized official shall make his damage determination by estimating the monetary damages resulting from the discharge of oil or release of a hazardous substance based upon the information provided in the Quantification phase and the guidance provided in this Damage Determination phase.

(2) The Damage Determination phase consists of §11.80—general; §11.81—Restoration and Compensation Determination Plan; §11.82—alternatives for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources; §11.83—cost estimating and valuation methodologies; and §11.84—implementation guidance, of this part.

(b) *Purpose.* The purpose of the Damage Determination phase is to establish the amount of money to be sought in compensation for injuries to natural resources resulting from a discharge of oil or release of a hazardous substance. The measure of damages is the cost of restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured natural resources and the services those resources provide. Damages may also include, at the discretion of the authorized official, the compensable value of all or a portion of the services lost to the public for the time period from the discharge or release until the attainment of the restoration, rehabilitation, replacement, and/or acquisition of equivalent of the resources and their services to baseline.

(c) *Steps in the Damage Determination phase.* The authorized official shall develop a Restoration and Compensation Determination Plan, described in §11.81 of this part. To prepare this Restoration and Compensation Determination Plan, the authorized official shall develop a reasonable number of possible alternatives for restoration, rehabilitation, replacement, and/or acquisition of

equivalent resources and select, pursuant to the guidance of § 11.82 of this part, the most appropriate of those alternatives; and identify the cost estimating and valuation methodologies, described in § 11.83 of this part, that will be used to calculate damages. The guidance provided in § 11.84 of this part shall be followed in implementing the cost estimating and valuation methodologies. After public review of the Restoration and Compensation Determination Plan, the authorized official shall implement the Restoration and Compensation Determination Plan.

(d) *Completion of the Damage Determination phase.* Upon completion of the Damage Determination phase, the type B assessment is completed. The results of the Damage Determination phase shall be documented in the Report of Assessment described in § 11.90 of this part.

[59 FR 14283, Mar. 25, 1994]

§ 11.81 Damage determination phase—restoration and compensation determination plan.

(a) *Requirement.* (1) The authorized official shall develop a Restoration and Compensation Determination Plan that will list a reasonable number of possible alternatives for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources and the related services lost to the public associated with each; select one of the alternatives and the actions required to implement that alternative; give the rationale for selecting that alternative; and identify the methodologies that will be used to determine the costs of the selected alternative and, at the discretion of the authorized official, the compensable value of the services lost to the public associated with the selected alternative.

(2) The Restoration and Compensation Determination Plan shall be of sufficient detail to evaluate the possible alternatives for the purpose of selecting the appropriate alternative to use in determining the cost of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources for the injured natural resources and the services those resources provided, and, where relevant, the compensable value of the services lost to the public through the completion of the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources and their services to the baseline.

(b) The authorized official shall use the guidance in §§ 11.82, 11.83, and 11.84 of this part to develop the Restoration and Compensation Determination Plan.

(c) The authorized official shall list the methodologies he expects to use to determine the costs of all actions considered within the selected alternative and, where relevant, the compensable value of the lost services through the recovery period associated with the selected alternative. The methodologies to use in determining costs and compensable value are described in § 11.83 of this part.

(d)(1) The Restoration and Compensation Determination Plan shall be part of the Assessment Plan developed in subpart B of this part. If existing data are not sufficient to develop the Restoration and Compensation Determination Plan at the time that the overall Assessment Plan is made available for public review and comment, the Restoration and Compensation Determination Plan may be developed later, after the completion of the Injury Determination or Quantification phases.

(2) If the Restoration and Compensation Determination Plan is prepared later than the Assessment Plan, it shall be made available separately for public review by any identified potentially responsible party, other natural resource trustees, other affected Federal or State agencies or Indian tribes, and any other interested members of the public for a period of no less than 30 calendar days. Reasonable extensions may be granted as appropriate.

(3) Comments received from any identified potentially responsible party, other natural resource trustees, other affected Federal or State agencies or Indian tribes, or any other interested members of the public, together with responses to those comments, shall be included as part of the Report of Assessment, described in § 11.90 of this part.

(4) Appropriate public review of the plan must be completed before the authorized official performs the methodologies listed in the Restoration and Compensation Determination Plan.

(e) The Restoration and Compensation Determination Plan may be expanded to incorporate requirements from procedures required under other portions of CERCLA or the CWA or from other Federal, State, or tribal laws applicable to restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured resources or may be combined with other plans for related purposes, so long as the requirements of this section are fulfilled.

[59 FR 14283, Mar. 25, 1994]

§ 11.82 Damage determination phase—alternatives for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.

(a) *Requirement.* The authorized official shall develop a reasonable number of possible alternatives for the restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured natural resources and the services those resources provide. For each possible alternative developed, the authorized official will identify an action, or set of actions, to be taken singly or in combination by the trustee agency to achieve the restoration, rehabilitation, replacement, and/or acquisition of equivalent natural resources and the services those resources provide to the baseline. The authorized official shall then select from among the possible alternatives the alternative that he determines to be the most appropriate based on the guidance provided in this section.

(b) *Steps.* (1) The authorized official shall develop a reasonable number of possible alternatives that would restore, rehabilitate, replace, and/or acquire the equivalent of the injured resources. Each of the possible alternatives may, at the discretion of the authorized official, consist of actions, singly or in combination, that would achieve those purposes.

(i) Restoration or rehabilitation actions are those actions undertaken to return injured resources to their baseline condition, as measured in terms of the physical, chemical, or biological properties that the injured resources would have exhibited or the services that would have been provided by those resources had the discharge of oil or release of the hazardous substance under investigation not occurred. Such actions would be in addition to response actions completed or anticipated pursuant to the National Contingency Plan (NCP).

(ii) Replacement or acquisition of the equivalent means the substitution for injured resources with resources that provide the same or substantially similar services, when such substitutions are in addition to any substitutions made or anticipated as part of response actions and when such substitutions exceed the level of response actions determined appropriate to the site pursuant to the NCP.

(iii) Possible alternatives are limited to those actions that restore, rehabilitate, replace, and/or acquire the equivalent of the injured resources and services to no more than their baseline, that is, the condition without a discharge or release as determined in § 11.72 of this part.

(2) *Services provided by the resources.* (i) In developing each of the possible alternatives, the authorized official shall list the proposed actions that would restore, rehabilitate, replace, and/or acquire the equivalent of the services provided by the injured natural resources that have been lost, and the period of time over which these services would continue to be lost.

(ii) The authorized official shall identify services previously provided by the resources in their baseline condition in accordance with § 11.72 of this part and compare those services with services now provided by the injured resources, that is, the with-a-discharge-or-release condition. All estimates of the with-a-discharge-or-release condition shall incorporate consideration of the ability of the resources to recover as determined in § 11.73 of this part.

(c) *Range of possible alternatives.* (1) The possible alternatives considered by the authorized official that return the injured resources and their lost services to baseline level could range from: Intensive action on the part of the authorized official to return the various resources and services provided by those resources to baseline conditions as quickly as possible; to natural recovery with minimal management actions. Possible alternatives within this

range could reflect varying rates of recovery, combination of management actions, and needs for resource replacements or acquisitions.

(2) An alternative considering natural recovery with minimal management actions, based upon the "No Action-Natural Recovery" determination made in §11.73(a)(1) of this part, shall be one of the possible alternatives considered.

(d) *Factors to consider when selecting the alternative to pursue.* When selecting the alternative to pursue, the authorized official shall evaluate each of the possible alternatives based on all relevant considerations, including the following factors:

(1) Technical feasibility, as that term is used in this part.

(2) The relationship of the expected costs of the proposed actions to the expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.

(3) Cost-effectiveness, as that term is used in this part.

(4) The results of any actual or planned response actions.

(5) Potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other resources.

(6) The natural recovery period determined in §11.73(a)(1) of this part.

(7) Ability of the resources to recover with or without alternative actions.

(8) Potential effects of the action on human health and safety.

(9) Consistency with relevant Federal, State, and tribal policies.

(10) Compliance with applicable Federal, State, and tribal laws.

(e) A Federal authorized official shall not select an alternative that requires acquisition of land for Federal management unless the Federal authorized official determines that restoration, rehabilitation, and/or other replacement of the injured resources is not possible.

[59 FR 14284, Mar. 25, 1994]]

§11.83 Damage determination phase—use value methodologies.

(a) *General.* (1) This section contains guidance and methodologies for determining: The costs of the selected alternative for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources; and the compensable value of the services lost to the public through the completion of the restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured resources and their services to baseline.

(2)(i) The authorized official shall select among the cost estimating and valuation methodologies set forth in this section, or methodologies that meet the acceptance criterion of either paragraph (b)(3) or (c)(3) of this section.

(ii) The authorized official shall define the objectives to be achieved by the application of the methodologies.

(iii) The authorized official shall follow the guidance provided in this section for choosing among the methodologies that will be used in the Damage Determination phase.

(iv) The authorized official shall describe his selection of methodologies and objectives in the Restoration and Compensation Determination Plan.

(3) The authorized official shall determine that the following criteria have been met when choosing among the cost estimating and valuation methodologies. The authorized official shall document this determination in the Report of the Assessment. Only those methodologies shall be chosen:

(i) That are feasible and reliable for a particular incident and type of damage to be measured.

(ii) That can be performed at a reasonable cost, as that term is used in this part.

(iii) That avoid double counting or that allow any double counting to be estimated and eliminated in the final damage calculation.

(iv) That are cost-effective, as that term is used in this part.

(b) *Costs of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.* (1) Costs for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources are the amount of money determined by the authorized official as necessary to complete all actions identified in the selected alternative for restoration, rehabilitation, replacement, and/or acquisition of equivalent resources, as selected in the Restoration and Compensation Determination Plan of §11.81

of this part. Such costs shall include direct and indirect costs, consistent with the provisions of this section.

(i) Direct costs are those that are identified by the authorized official as attributed to the selected alternative. Direct costs are those charged directly to the conduct of the selected alternative including, but not limited to, the compensation of employees for the time and effort devoted to the completion of the selected alternative; cost of materials acquired, consumed, or expended specifically for the purpose of the action; equipment and other capital expenditures; and other items of expense identified by the authorized official that are expected to be incurred in the performance of the selected alternative.

(ii) Indirect costs are costs of activities or items that support the selected alternative, but that cannot practically be directly accounted for as costs of the selected alternative. The simplest example of indirect costs is traditional overhead, e.g., a portion of the lease costs of the buildings that contain the offices of trustee employees involved in work on the selected alternative may, under some circumstances, be considered as an indirect cost. In referring to costs that cannot practically be directly accounted for, this subpart means to include costs that are not readily assignable to the selected alternative without a level of effort disproportionate to the results achieved.

(iii) An indirect cost rate for overhead costs may, at the discretion of the authorized official, be applied instead of calculating indirect costs where the benefits derived from the estimation of indirect costs do not outweigh the costs of the indirect cost estimation. When an indirect cost rate is used, the authorized official shall document the assumptions from which that rate has been derived.

(2) *Cost estimating methodologies.* The authorized official may choose among the cost estimating methodologies listed in this section or may choose other methodologies that meet the acceptance criterion in paragraph (b)(3) of this section. Nothing in this section precludes the use of a combination of cost estimating methodologies so long as the authorized official does not double count or uses techniques that allow any double counting to be estimated and eliminated in the final damage calculation.

(i) *Comparison methodology.* This methodology may be used for unique or difficult design and estimating conditions. This methodology requires the construction of a simple design for which an estimate can be found and applied to the unique or difficult design.

(ii) *Unit methodology.* This methodology derives an estimate based on the cost per unit of a particular item. Many other names exist for describing the same basic approach, such as order of magnitude, lump sum, module estimating, flat rates, and involve various refinements. Data used by this methodology may be collected from technical literature or previous cost expenditures.

(iii) *Probability methodologies.* Under these methodologies, the cost estimate represents an "average" value. These methodologies require information which is called certain, or deterministic, to derive the expected value of the cost estimate. Expected value estimates and range estimates represent two types of probability methodologies that may be used.

(iv) *Factor methodology.* This methodology derives a cost estimate by summing the product of several items or activities. Other terms such as ratio and percentage methodologies describe the same basic approach.

(v) *Standard time data methodology.* This methodology provides for a cost estimate for labor. Standard time data are a catalogue of standard tasks typically undertaken in performing a given type of work.

(vi) *Cost- and time-estimating relationships (CERs and TERs).* CERs and TERs are statistical regression models that mathematically describe the cost of an item or activity as a function of one or more independent variables. The regression models provide statistical relationships between cost or time and physical or performance characteristics of past designs.

(3) *Other cost estimating methodologies.* Other cost estimating methodologies that are based upon standard and accepted cost estimating practices and

are cost-effective are acceptable methodologies to determine the costs of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources under this part.

(c) *Compensable value.* (1) Compensable value is the amount of money required to compensate the public for the loss in services provided by the injured resources between the time of the discharge or release and the time the resources and the services those resources provided are fully returned to their baseline conditions. The compensable value includes the value of lost public use of the services provided by the injured resources, plus lost nonuse values such as existence and bequest values. Compensable value is measured by changes in consumer surplus, economic rent, and any fees or other payments collectable by a Federal or State agency or an Indian tribe for a private party's use of the natural resources; and any economic rent accruing to a private party because the Federal or State agency or Indian tribe does not charge a fee or price for the use of the resources.

(i) Use value is the value of the resources to the public attributable to the direct use of the services provided by the natural resources.

(ii) Nonuse value is the difference between compensable value and use value, as those terms are used in this section.

(iii) Estimation of option and existence values shall be used only if the authorized official determines that no use values can be determined.

(2) *Valuation methodologies.* The authorized official may choose among the valuation methodologies listed in this section to estimate willingness to pay (WTP) or may choose other methodologies provided that the methodology can satisfy the acceptance criterion in paragraph (c)(3) of this section. Nothing in this section precludes the use of a combination of valuation methodologies so long as the authorized official does not double count or uses techniques that allow any double counting to be estimated and eliminated in the final damage calculation.

(i) *Market price methodology.* This methodology may be used if the natural resources are traded in the market. In using this methodology, the authorized official should make a determination as to whether the market for the resources is reasonably competitive. If the authorized official determines that the market for the resources, or the services provided by the resources, is reasonably competitive, the diminution in the market price of the injured resources, or the lost services, may be used to determine the compensable value of the injured resources.

(ii) *Appraisal methodology.* Where sufficient information exists, the appraisal methodology may be used. In using this methodology, compensable value should be measured, to the extent possible, in accordance with the applicable sections of the "Uniform Appraisal Standards for Federal Land Acquisition" (Uniform Appraisal Standards), Interagency Land Acquisition Conference, Washington, DC, 1973 (incorporated by reference, see § 11.18). The measure of compensable value under this appraisal methodology will be the difference between the with- and without-injury appraisal value determined by the comparable sales approach as described in the Uniform Appraisal Standards.

(iii) *Factor income methodology.* If the injured resources are inputs to a production process, which has as an output a product with a well-defined market price, the factor income methodology may be used. This methodology may be used to determine the economic rent associated with the use of resources in the production process. This methodology is sometimes referred to as the "reverse value added" methodology. The factor income methodology may be used to measure the in-place value of the resources.

(iv) *Travel cost methodology.* The travel cost methodology may be used to determine a value for the use of a specific area. An individual's incremental travel costs to an area are used as a proxy for the price of the services of that area. Compensable value of the area to the traveler is the difference between the value of the area with and without a discharge or release. When regional travel cost models exist, they may be used if appropriate.

(v) *Hedonic pricing methodology.* The hedonic pricing methodology may be used to determine the value of nonmarketed resources by an analysis of private market choices. The demand for nonmarketed natural resources is thereby estimated indirectly by an analysis of commodities that are traded in a market.

(vi) *Unit value methodology.* Unit values are preassigned dollar values for various types of nonmarketed recreational or other experiences by the public. Where feasible, unit values in the region of the affected resources and unit values that closely resemble the recreational or other experience lost with the affected resources may be used.

(vii) *Contingent valuation methodology.*(A) The contingent valuation methodology includes all techniques that set up hypothetical markets to elicit an individual's economic valuation of a natural resource. This methodology can determine use values and explicitly determine option and existence values. This methodology may be used to determine lost use values of injured natural resources.

(B) The use of the contingent valuation methodology to explicitly estimate option and existence values should be used only if the authorized official determines that no use values can be determined.

(3) *Other valuation methodologies.* Other valuation methodologies that measure compensable value in accordance with the public's WTP, in a cost-effective manner, are acceptable methodologies to determine compensable value under this part.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5175, Feb. 22, 1988; 59 FR 14285, Mar. 25, 1994]

§ 11.84 Damage determination phase—implementation guidance.

(a) *Requirement.* The authorized official should use the cost estimating and valuation methodologies in § 11.83 of this part following the appropriate guidance in this section.

(b) *Determining uses.* (1) Before estimating damages for compensable value under § 11.83 of this part, the authorized official should determine the uses made of the resource services identified in the Quantification phase.

(2) Only committed uses, as that phrase is used in this part, of the resource or services over the recovery period will be used to measure the change from the baseline resulting from injury to a resource. The baseline uses must be reasonably probable, not just in the realm of possibility. Purely speculative uses of the injured resource are precluded from consideration in the estimation of damages.

(3)(i) When resources or resource services have mutually exclusive uses, the highest-and-best use of the injured resource or services, as determined by the authorized official, shall be used as the basis of the analyses required in this part. This determination of the highest-and-best use must be consistent with the requirements of paragraph (b)(2) of this section.

(ii) If the uses of the resource or service are not necessarily mutually exclusive, the sum of damages should be determined from individual services. However, the sum of the projected damages from individual services shall consider congestion or crowding out effects, if any, from the resulting projected total use of those services.

(c) *Double counting.* (1) Double counting of damages should be avoided. Double counting means that a benefit or cost has been counted more than once in the damage assessment.

(2) Natural resource damages are the residual to be determined by incorporating the effects, or anticipated effects, of any response actions. To avoid one aspect of double counting, the effects of response actions shall be factored into the analysis of damages. If response actions will not be completed until after the assessment has been initiated, the anticipated effects of such actions should be included in the assessment.

(d) *Uncertainty.* (1) When there are significant uncertainties concerning the assumptions made in all phases of the assessment process, reasonable alternative assumptions should be examined. In such cases, uncertainty should be handled explicitly in the analysis and documented. The uncertainty should be incorporated in the estimates of benefits and costs.

(2) To incorporate this uncertainty, the authorized official should derive a range of probability estimates for the important assumptions used to determine damages. In these instances, the damage estimate will be the net expected present value of the costs of restoration, rehabilitation, replacement, and/or acquisition of equivalent resources and, if relevant, compensable value.

(e) *Discounting.* (1) Where possible, damages should be estimated in the form of an expected present value dollar amount. In order to perform this calculation, a discount rate must be selected.

(2) The discount rate to be used is that specified in "Office of Management and Budget (OMB) Circular A–94 Revised" (dated March 27, 1972, available from the Executive Office of the President, Publications, 726 Jackson Place, NW., Washington, DC 20503; ph: (202) 395–7372).

(f) *Substitutability.* In calculating compensable value, the authorized official should incorporate estimates of the ability of the public to substitute resource services or uses for those of the injured resources. This substitutability should be estimated only if the potential benefits from an increase in accuracy are greater than the potential costs.

(g) *Compensable value during the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.* (1) In determining the amount of damages, the authorized official has the discretion to compute compensable value for the period of time required to achieve the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.

(2) When calculating compensable value during the period of time required to achieve restoration, rehabilitation, replacement, and/or acquisition of equivalent resources, the authorized official should follow the procedures described below. The procedures need not be followed in sequence.

(i) The ability of the injured resources to recover over the recovery period should be estimated. This estimate includes estimates of natural recovery rates as well as recovery rates that reflect management actions or resource acquisitions to achieve restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.

(ii) A recovery rate should be selected for this analysis that is based upon cost-effective management actions or resource acquisitions, including a "No Action-Natural Recovery" alternative. After the recovery rate is estimated, compensable value should be estimated.

(iii) The rate at which the uses of the injured resources and their services will be restored through the restoration or replacement of the services should be estimated. This rate may be discontinuous, that is, no uses are restored until all, or some threshold level, of the services are restored, or continuous, that is, restoration or replacement of uses will be a function of the level and rate of restoration or replacement of the services. Where practicable, the supply of and demand for the restored services should be analyzed, rather than assuming that the services will be utilized at their full capacity at each period of time in the analysis. Compensable value should be discounted using the rate described in paragraph (e)(2) of this section. This estimate is the expected present value of uses obtained through restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.

(iv) The uses of the resource that would have occurred in the absence of the discharge or release should be estimated. This estimate should be done in accordance with the procedures in §11.72 of this part. These uses should be estimated over the same time period using the same discount rate as that specified in paragraph (e)(2) of this section. This amount is the expected present value of uses forgone.

(v) Subtraction of the present value of uses obtained through restoration or replacement from the expected present value of uses forgone gives the amount of compensation that may be included, if positive, in a measure of damages.

(h) *Scope of the analysis.* (1) The authorized official must determine the scope of the analysis in order to estimate compensable value.

(2) In assessments where the scope of analysis is Federal, only the compensable value to the Nation as a whole should be counted.

(3) In assessments where the scope of analysis is at the State level, only the compensable value to the State should be counted.

(4) In assessments where the scope of analysis is at the tribal level, only the compensable value to the tribe should be counted.

[51 FR 27725, Aug. 1, 1986, as amended at 53 FR 5176, Feb. 22, 1988; 59 FR 14286, Mar. 25, 1994]

Subpart F—Post-Assessment Phase

§ 11.90 What documentation must the authorized official prepare after completing the assessment?

(a) At the conclusion of an assessment, the authorized official must prepare a Report of Assessment that consists of the Preassessment Screen Determination, the Assessment Plan, and the information specified in paragraphs (b) and (c) of this section as applicable.

(b) When the authorized official has used a type A procedure, the Report of Assessment must include the information specified in subpart D.

(c) When the authorized official has used type B procedures, the Report of Assessment must include all documentation supporting the determinations required in the Injury Determination phase, the Quantification phase, and the Damage Determination phase, and specifically including the test results of any and all methodologies performed in these phases. The preliminary estimate of damages shall be included in the Report of Assessment. The Restoration and Compensation Determination Plan, along with comments received during the public review of that Plan and responses to those comments, shall also be included in the Report of Assessment.

[51 FR 27725, Aug. 1, 1986, as amended at 59 FR 14287, Mar. 25, 1994; 61 FR 20612, May 7, 1996]

§ 11.91 How does the authorized official seek recovery of the assessed damages from the potentially responsible party?

(a) At the conclusion of the assessment, the authorized official must present to the potentially responsible party a demand in writing for the damages determined in accordance with this part and the reasonable cost of the assessment. [See § 11.92(b) to determine how the authorized official must adjust damages if he or she plans to place recovered funds in a non-interest-bearing account.] The authorized official must deliver the demand in a manner that establishes the date of receipt. The demand shall adequately identify the Federal or State agency or Indian tribe asserting the claim, the general location and description of the injured resource, the type of discharge or release determined to have resulted in the injuries, and the damages sought from that party.

(b) *Report of assessment.* The demand letter shall include the Report of Assessment as an attachment.

(c) *Rebuttable presumption.* When performed by a Federal or State official in accordance with this part, the natural resource damage assessment and the resulting Damage Determination supported by a complete administrative record of the assessment including the Report of Assessment as described in § 11.90 of this part shall have the force and effect of a rebuttable presumption on behalf of any Federal or State claimant in any judicial or adjudicatory administrative proceeding under CERCLA, or section 311 of the CWA.

(d) *Potentially responsible party response.* The authorized official should allow at least 60 days from receipt of the demand by the potentially responsible party, with reasonable extensions granted as appropriate, for the potentially responsible party to acknowledge and respond to the demand, prior to filing suit. In cases governed by section 113(g) of CERCLA, the authorized official may include a notice of intent to file suit and must allow at least 60 days from receipt of the demand by the

potentially responsible party, with reasonable extensions granted as appropriate, for the potentially responsible party to acknowledge and respond to the demand, prior to filing suit.

(e) *Statute of limitations.* For the purposes of section 113(g) of CERCLA, the date on which regulations are promulgated under section 301(c) of CERCLA is the date on which the later of the revisions to the type A rule and the type B rule, pursuant to *State of Colorado* v. *United States Department of the Interior,* 880 F.2d 481 (D.C. Cir. 1989), and *State of Ohio* v. *United States Department of the Interior,* 880 F.2d 432 (D.C. Cir. 1989), is published as a final rule in the FEDERAL REGISTER.

[53 FR 5176, Feb. 22, 1988, as amended at 59 FR 14287, Mar. 25, 1994; 61 FR 20612, May 7, 1996]

§ 11.92 Post-assessment phase—restoration account.

(a) *Disposition of recoveries.* (1) All sums (damage claim and assessment costs) recovered pursuant to section 107(f) of CERCLA or sections 311(f)(4) and (5) of the CWA by the Federal government acting as trustee shall be retained by the trustee, without further appropriation, in a separate account in the U.S. Treasury.

(2) All sums (damage claim and assessment costs) recovered pursuant to section 107(f) of CERCLA, or sections 311(f)(4) and (5) of the CWA by a State government acting as trustee shall either:

(i) Be placed in a separate account in the State treasury; or

(ii) Be placed by the responsible party or parties in an interest bearing account payable in trust to the State agency acting as trustee.

(3) All sums (damage claim and assessment costs) recovered pursuant to section 107(f) of CERCLA or sections 311(f)(4) and (5) of the CWA by an Indian tribe shall either:

(i) Be placed in an account in the tribal treasury; or

(ii) Be placed by the responsible party or parties in an interest bearing account payable in trust to the Indian tribe.

(b) *Adjustments.* (1) In establishing the account pursuant to paragraph (a) of this section, the calculation of the expected present value of the damage amount should be adjusted, as appropriate, whenever monies are to be placed in a non-interest bearing account. This adjustment should correct for the anticipated effects of inflation over the time estimated to complete expenditures for the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.

(2) In order to make the adjustment in paragraph (b)(1) of this section, the authorized official should adjust the damage amount by the rate payable on notes or bonds issued by the United States Treasury with a maturity date that approximates the length of time estimated to complete expenditures for the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.

(c) *Payments from the account.* Monies that constitute the damage claim amount shall be paid out of the account established pursuant to paragraph (a) of this section only for those actions described in the Restoration Plan required by § 11.93 of this part.

[53 FR 5176, Feb. 22, 1988, as amended at 59 FR 14287, Mar. 25, 1994]

§ 11.93 Post-assessment phase—restoration plan.

(a) Upon determination of the amount of the award of a natural resource damage claim as authorized by section 107(a)(4)(C) of CERCLA, or sections 311(f)(4) and 311(f)(5) of the CWA, the authorized official shall prepare a Restoration Plan as provided in section 111(i) of CERCLA. The plan shall be based upon the Restoration and Compensation Determination Plan described in §§ 11.81 of this part. The Plan shall describe how the monies will be used to address natural resources, specifically what restoration, rehabilitation, replacement, or acquisition of the equivalent resources will occur. When damages for compensable value have been awarded, the Plan shall also describe how monies will be used to address the services that are lost to the public until restoration, rehabilitation, replacement, and/or acquisition of equivalent resources is completed. The Restoration Plan shall be prepared in accordance with the guidance set forth in § 11.81 of this part.

Definitions

Background (mean) current—net long-term current flow (i.e., one direction only), attributable to forces such as winds, river flow, water density, and tides, that remains when all the oscillatory (tidal) components have been removed either mathematically or by measurement techniques.

Landward open water—a body of water that does not contain vegetation (e.g., wetland, seagrass, or kelp) or invertebrate reef (e.g., coral reef) and is classified as "landward" in Table 6.2, Volume I of the NRDAM/CME technical document.

Province—one of the geographic areas delineated in Table 6.1, Volume I of the NRDAM/CME technical document.

Seaward open water—a body of water that does not contain vegetation (e.g., wetlands, seagrass, or kelp) or invertebrate reef (e.g., coral reef) and is classified as "seaward" in Table 6.2, Volume I of the NRDAM/CME technical document.

Structured— in an area that contains vegetation (e.g., wetlands, seagrass, or kelp) or invertebrate reef (e.g., coral reef).

Tidal current—currents caused by alternating rise and fall of the sea level due to the gravitational forces between the earth, moon, and sun.

Tidal range—difference between the highest and lowest height of the tide.

[61 FR 20612, May 7, 1996]

APPENDIX III TO PART 11—FORMAT FOR DATA INPUTS AND MODIFICATIONS TO THE NRDAM/GLE

This appendix specifies the format for data inputs and modifications to the NRDAM/GLE under §11.41. Consult the back of this appendix for definitions.

Point of Analysis

The NRDAM/GLE begins its calculations at the point that the released substance entered water in an area represented by its geographic database. Any water within the geographic boundaries of the NRDAM/GLE is a "Great Lakes environment." The authorized official must determine all data inputs and modifications as of the time and location that the released substance entered a Great Lakes environment. In the case of a release that began in water in an area within the boundaries of the NRDAM/GLE, this point will be the same as the point of the release. However, for releases that begin on land or that begin outside the boundaries of the NRDAM/GLE, this point will not be the point of the release but rather the point at which the released substance migrates into a Great Lakes environment.

Required Data Inputs

Documentation of source of data inputs; and

Identity of Substance

For release of single substance:

Name of the released substance that entered a Great Lakes environment as it appears in Table 7.1, Volume I of the NRDAM/GLE technical document (incorporated by reference, see §11.18).

For releases of two or more substances or a release of a mixture of two or more substances:

Name of only one of the released substances that entered a Great Lakes environment as it appears in Table 7.1, Volume I of the NRDAM/GLE technical document.

Mass or Volume

For releases of single substance:

Mass or volume of identified substance that entered a Great Lakes environment stated in tonnes, barrels, gallons, liters, pounds, or kilograms.

For releases of two or more substances or a release of a mixture of two or more substances:

Mass or volume of the one identified substance (rather than total mass) that entered a Great Lakes environment stated in tonnes, barrels, gallons, liters, pounds, or kilograms.

Duration

Length of time over which the identified substance entered a Great Lakes environment stated in hours.

Time

Year, month, day, and hour when the identified substance first entered a Great Lakes environment.

Location

Latitude and longitude, stated in degrees and decimal minutes, where the identified substance entered a Great Lakes environment.

Winds

At least one set of data on prevailing wind conditions for each day of the 30-day period beginning 24 hours before the identified substance entered a Great Lakes environment. Each set must include:

Wind velocity stated in knots or meters per second; and Corresponding wind direction stated in the degree angle of the wind's origin.

[One possible source of information is the National Climatic Data Center, Asheville, NC (703) 271-4800.]

Response Actions

Percentage of identified substance removed from water surface, bottom sediments, and shoreline; and

For each medium cleaned (water surface, bottom sediments, or shoreline), the number of days after the identified substance entered a Great Lakes environment that removal began and ended.

Closures

Documentation that the closure was ordered by an appropriate agency as a result of the release; and

For boating areas:

Number of weekend days of closure stated by calendar month;

Number of weekday days of closure stated by calendar month; and

Area closed stated in square kilometers.

For beaches:

Whether the beach was Federal or State (including municipal or county);

Number of days of closure stated by calendar month; and

Length of shoreline closed stated in meters.

For fisheries:

Whether area closed was an offshore, nearshore, or wetland fishery;

Number of days of closure; and

Area closed stated in square kilometers.

For furbearer hunting or trapping areas and waterfowl hunting areas:

Number of days of closure; and

Area closed stated in square kilometers.

Implicit Price Deflator

Quarterly implicit price deflator for the Gross National Product (base year 1992) for the quarter in which the identified substance entered a Great Lakes environment. [See the Survey of Current Business, published by the U.S. Department of Commerce/Bureau of Economic Analysis, 1441 L Street, NW, Washington, D.C., 20230, (202) 606–9900.]

MODIFICATIONS TO THE NRDAM/GLE DATABASES (IF ANY)

Documentation of the source of the modifications; and

For air temperature:

Air temperature, stated in degrees Celsius, assigned by the NRDAM/GLE at the point that the identified substance entered a Great Lakes environment (see Table III.6.1, Volume III of the NRDAM/GLE technical document); and

Substitute air temperature stated in degrees Celsius.

For water temperature at the surface:

Water temperature at the surface, stated in degrees Celsius, assigned by the NRDAM/GLE at the point that the identified substance entered a Great Lakes environment (see Table III.6.2.6, Volume III of the NRDAM/GLE technical document); and

Substitute water temperature stated in degrees Celsius.

For total suspended sediment concentration:

Total suspended sediment concentration, stated in milligrams per liter, assigned by the NRDAM/GLE at the point that the identified substance entered a Great Lakes environment (see Section 3, Volume I of the NRDAM/GLE technical document); and

Substitute suspended sediment concentration stated in milligrams per liter.

For mean settling velocity of suspended solids:

Mean settling velocity of suspended sediments, stated in meters per day, assigned by the NRDAM/GLE at the point that the identified substance entered a Great Lakes environment (see Section 3, Volume I of the NRDAM/GLE technical document); and

Substitute suspended sediment concentration stated in milligrams per liter.

For habitat type:

Latitude and longitude bounds of area for which the habitat type is being modified;

Habitat type assigned by the NRDAM/GLE (see Section 6.2, Volume III of the NRDAM/GLE technical document); and

Substitute habitat type.

If the authorized official turns off the ice modeling function, then he or she must provide documentation that ice was absent from the site of the release.

Definitions

Nearshore fishery—fishery in an open water area that is less than 30 feet in depth or is in a connecting channel.

Offshore fishery—fishery in an open water area that is 30 feet or more in depth.

Wetland fishery—fishery that is not in an open water area.

[61 FR 20614, May 7, 1996]

PART 12—ADMINISTRATIVE AND AUDIT REQUIREMENTS AND COST PRINCIPLES FOR ASSISTANCE PROGRAMS

Subpart A—Administrative and Audit Requirements and Cost Principles for Assistance Programs

Sec.

tle 15--Commerce and Foreign Trade

HAPTER IX--NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, EPARTMENT OF COMMERCE

\RT 990--NATURAL RESOURCE DAMAGE ASSESSMENTS

SUBCHAPTER E—OIL POLLUTION ACT REGULATIONS

PART 990—NATURAL RESOURCE DAMAGE ASSESSMENTS

Subpart A—Introduction

Subpart B—Authorities

Subpart C—Definitions

Subpart D—Preassessment Phase

Subpart E—Restoration Planning Phase

Subpart F—Restoration Implementation Phase

AUTHORITY: 33 U.S.C. 2701 *et seq.*

SOURCE: 61 FR 500, Jan. 5, 1996, unless otherwise noted.

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.

(3) Trustees may develop pre-incident or incident-specific memoranda of understanding to coordinate their activities.

(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 available must be consistent with the federal trustee agency's NEPA requirements.

(d) *Relationship to Regional Restoration Plans or an existing restoration project.* If a 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 avoid irreversible loss of natural resources, or to prevent or reduce any continuing danger to natural resources or similar need for emergency action;

(2) The action will not be undertaken by the lead response agency;

(3) The action is feasible and likely to succeed;

(4) Delay of the action to complete the restoration planning process established in this part likely would result in increased natural resource damages; and

(5) The costs of the action are not unreasonable.

(b) If response actions are still underway, trustees must coordinate with the On-Scene Coordinator (OSC), consistent with the NCP, to ensure that emergency restoration actions will not interfere with or duplicate ongoing response actions. Emergency restoration may not address residual oil unless:

(1) The OSC's response is complete; or

(2) The OSC has determined that the residual oil identified by the trustee as part of a proposed emergency restoration action does not merit further response.

(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.

[61 FR 500, Jan. 5, 1996, as amended at 67 FR 61492, Oct. 1, 2002]

§ 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)).

Indirect costs means expenses that are jointly or commonly incurred to produce two or more products or services. In contrast to direct costs, indirect costs are not specifically identifiable with any of the products or services, but are necessary for the organization to function and produce the products or services. An indirect cost rate, developed in accordance with generally accepted accounting principles, may be used to allocate indirect costs to specific assessment and restoration activities. Both direct and indirect costs contribute to the full cost of the assessment and restoration, as provided in this part.

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.

Legal costs means the costs of attorney actions performed for the purpose of assessment or developing a restoration plan, in accordance with this part.

(1) When making a determination of the nature of attorneys' actions for purposes of this definition, trustees must consider whether:

(i) The action comprised all or part of an action specified either in this part or in OPA section 1006(c);

(ii) The action was performed prior to, or in the absence of, the filing of ligation by or on behalf of the trustee in question to recover damages; and

(iii) The action was performed by an attorney who was working for or on behalf of the trustee agency, as opposed to a prosecutorial agency.

(2) If all of the criteria in paragraph (1) of this definition are met, the costs associated with attorney's actions are deemed assessment costs. If the criteria are not met, the trustee must explain why the action was not performed for the primary purpose of furthering litigation in order to support a characterization of the action as an assessment action.

(3) Examples of common or routine assessment actions that may be most appropriately performed by trustee attorneys, in accordance with this part, include, but are not limited to:

(i) Providing written and oral advice on the requirements of OPA, this part, and other applicable laws;

(ii) Preparing public notices, including the Notice of Intent to Conduct Restoration Planning issued to responsible parties and the Notice of Availability of Draft Restoration Plans;

(iii) Developing and managing administrative records;

(iv) Preparing binding agreements with potentially responsible parties in

the context of the assessment, including study agreements, funding agreements, and restoration agreements;

(v) Preparing co-trustee cooperative agreements;

(vi) Preparing formal trustee determinations required under this part; and

(vii) Procuring title searches, title insurance, and/or conservation easements when property agreements are part of restoration packages.

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 they have determined that assessment actions undertaken were premised on the likelihood of injury and need for restoration. Reasonable assessment costs also include: administrative costs, legal costs, and other costs necessary to carry out this part; monitoring and oversight costs; costs associated with public participation; and indirect costs that are necessary to carry out this part.

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)).

[61 FR 500, Jan. 5, 1996, as amended at 67 FR 61493, Oct. 1, 2002]

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) Address conditions that would prevent or limit the effectiveness of any restoration action;

(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.

[61 FR 500, Jan. 5, 1996, as amended at 67 FR 61493, Oct. 1, 2002]

§ 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 § 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.

§ 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

§ 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 § 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 § 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 all trustee direct and indirect costs of assessment and restoration, 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 § 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 §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 §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.

(f) *Cost accounting procedures.* Trustees must use methods consistent with generally accepted accounting principles and the requirements of §990.27 of this part in determining past assessment and restoration costs incurred by trustees. When cost accounting for these costs, trustees must compound these costs using the guidance in §990.63(b) of this part.

(g) *Cost estimating procedures.* Trustees must use methods consistent with generally accepted cost estimating principles and meet the standards of §990.27 of this part in estimating future costs that will be incurred to implement a restoration plan. Trustees also must apply discounting methodologies in estimating costs using the guidance in §990.63(a) of this part.

[61 FR 500, Jan. 5, 1996, as amended at 67 FR 61493, Oct. 1, 2002]

§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 present the uncompensated claim for damages to the Oil Spill Liability Trust Fund, as provided in section 1012(a)(4) of OPA (33 U.S.C. 2712(a)(4)) 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).

[61 FR 500, Jan. 5, 1996, as amended at 67 FR 61493, Oct. 1, 2002]

§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.

Other References

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended (42 USC §§ 9601, *et seq.*):

http://www4.law.cornell.edu/uscode/42/9601.html

Oil Pollution Act of 1990 (OPA) (33 USC §§ 2701, *et seq.*):

http://www4.law.cornell.edu/uscode/33/2701.html

Federal Water Pollution Control Act or Clean Water Act (CWA), as amended (33 USC §§ 1251, et seq.), including but not limited to Section 311(f):

http://www4.law.cornell.edu/uscode/33/1251.html

National Oil and Hazardous Substances Pollution Contingency Plan (NCP), as amended (40 CFR 300):

http://www.doi.gov/oepc/response/ncp.htm

The National Environmental Policy Act of 1969, as amended (Pub. L. 91-190, 42 USC 4321-4347):

http://ceq.eh.doe.gov/nepa/regs/nepa/nepaeqia.htm
http://ceq.eh.doe.gov/

Council on Environmental Quality Executive Office of the President Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 CFR 1500-1508:

http://ceq.eh.doe.gov/nepa/regs/ceq/toc_ceq.htm

Kennecott Utah Copper Corporation, 319 U.S. App. D.C. 128; 88 F.3d 1191; 1996 U.S. App. LEXIS 17418; 42 ERC (BNA) 2089; 26 ELR 21489.

http://restoration.doi.gov/laws.html

State of Ohio, 279 U.S. App. D.C. 109; 880 F.2d 432; 1989 U.S. App. LEXIS 10156; 30 ERC (BNA) 1001; 19 ELR 21099.

http://restoration.doi.gov/laws.html

Appendix C

NRDAR FACA Committee

Committee Charter

Bylaws

Membership

Committee Charter

Office of the Secretary
Natural Resource Damage Assessment and Restoration Program

Natural Resource Damage Assessment and Restoration Advisory Committee

1. Official Designation: Natural Resource Damage Assessment and Restoration (NRDAR) Advisory Committee.

2. Scope and Objectives: The Committee will provide advice and recommendations on issues related to the Department of the Interior's authorities, responsibilities and implementation of the natural resource damage provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA – 42 USC §§ 9601, *et seq.*), the Oil Pollution Act (OPA – 33 USC §§ 2701, *et seq.*), and the Clean Water Act (CWA – 33 USC §§ 1251, *et seq.*)

3. Duration: The Board will exist for 2 years from the date of the Charter, unless renewed.

4. Official to Whom the Committee Reports: To the Department of the Interior's Assistant Secretary for Policy, Management and Budget through the Natural Resource Damage Assessment and Restoration Program Manager.

5. Administrative Support: Administrative support for activities of the Committee will be provided by the NRDAR Program Office.

6. Duties of the Committee: The Committee will provide advice and recommendations only. At the request of the NRDAR Program Manager or his/her designee, the Committee will meet periodically to gather and analyze information, discuss assessment and restoration practice issues, and – in an advisory capacity only – to develop recommendations for achieving ecologically sound, timely, and cost effective restoration of natural resources injured by releases of hazardous substances or oil.

7. Costs: The estimated annual cost associated with supporting the Committee's functions is $60,000 per year, including all direct and indirect expenses, including travel and per diem expenses when necessary and appropriate. It is estimated that 0.5 full time employees (FTEs) will be required to support the Committee. These expenses will be covered by the NRDAR Program out of its operating budget.

8. Meetings: The Committee will meet two to four times per year, but in no case less than once per year. Additional meetings may be called by the NRDAR Program Manager or his/her designee.

9. Termination Date: The Committee is subject to the provisions of the Federal Advisory Committee Act (FACA), 5 USC Appendix 2, and shall take no action without having complied with the Charter filing requirements of section 9 of FACA. The Committee is subject to biennial review and will terminate two years from the date the Charter is filed, unless, prior to that time, the Charter is renewed in accordance with section 14 of FACA.

10. Members: The Committee will consist of a group of up to 30 members, selected from personnel in the Department and other Federal natural resource trustee representatives, as well as representatives from other interested parties, including, but not limited to, State and tribal natural resource trustee representatives, business and industry, and national and local environmental groups. The Committee will reflect the diversity and balance of representation from among the interested party groups necessary to fulfill its purpose. The representatives will be selected by virtue of education, training, knowledge, or experience, and will be qualified to discuss and give informed advice about natural resource damage assessment and restoration practice issues. Non-Governmental Committee members must be appointed to represent a particular interest.

11. Ethics: A Committee member may not participate in matters that will directly affect or appear to directly affect the financial interests of the member or the member's spouse or minor children, unless authorized by the Designated Federal Officer. Compensation from employment does not constitute a disqualifying financial interest, so long as the matter before the Committee will not have a special or distinct effect on the holder of the financial interest. The provisions of this paragraph do not affect any statutory or regulatory ethical obligation to which a member may be subject.

12. Subcommittees and Working Groups: To facilitate the functioning of the Committee, subcommittees may be formed to study select issues and develop recommendations for consideration by the Committee. In conducting their business, subcommittees may establish working groups or task forces to take on specific assignments, including fact-finding, analysis, demonstration projects, and preparing preliminary information for consideration by subcommittees. Subcommittee members do not necessarily have to serve as members of the Committee, and will be identified by the NRDAR Program Manager by virtue of their expertise and interest in specific issues. All subcommittee reports or recommendations will be presented to the Committee for consideration before being submitted to the NRDAR Program Manager.

13. Committee Operations: The NRDAR Program Manager will serve as the Designated Federal Officer and Chair the Committee. The NRDAR Program Manager will appoint individuals to serve as members of subcommittees, and will also appoint a Vice-Chair for the Committee. The Committee will, consistent with FACA, conduct open meetings, with an opportunity for interested persons to supply comments or make statements as time permits. The Committee will keep minutes of meetings and make them available to the public. The Committee will also make available to the public final reports and position papers produced by or for the Committee.

14. Authority: Sections 107, 111, and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA – 42 USC §§ 9607, 9611, and 9622); Section 311 of the Federal Water Pollution Control Act (Clean Water Act or CWA – 33 USC § 1321); and Section 1006 of the Oil Pollution Act (OPA – 33 USC § 2706).

Gale A Norton

SECRETARY OF THE INTERIOR

APR 12 2005

Date Signed

MAY 24 2005

Date Charter Filed

Bylaws

Adopted December 1, 2005
Amended March 2, 2006

Natural Resource Damage Assessment and Restoration Advisory Committee

Interim Bylaws and Operating Procedures

Section I: Purpose:

The purpose of the Natural Resource Damage Assessment and Restoration Advisory Committee (the Committee) is to provide advice to the Natural Resource Damage Assessment and Restoration Program Manager regarding issues related to the U.S. Department of the Interior's authorities, responsibilities, and activities under the natural resource damage provisions of Federal statutes such as the Superfund law, the Clean Water Act, and the Oil Pollution Act. The Committee's initial focus will be to assist the U.S. Department of the Interior in fulfilling its obligation to promulgate and review regulations outlining procedures for the assessment of natural resource injury or destruction caused by hazardous substance releases, and the determination of appropriate natural resource restoration to address such injury or destruction.

Section II: Authority:

The Secretary of the U.S. Department of the Interior has determined that the establishment of the Committee is in the public interest. The Committee is subject to the Federal Advisory Committee Act (FACA) as outlined in its Charter, filed with Congress on May 24, 2005.

Section III: Membership:

Members of the Committee are appointed by the Secretary of the U.S. Department of the Interior for such terms as may be appropriate for the accomplishment of the Committee's purpose. Members will be selected based on the specific needs of the Committee to represent a diverse and balanced perspective of natural resource damage assessment and restoration stakeholders–including representatives of State, Tribal, and Federal trustee agencies, potentially responsible party groups, environmental organizations, and research and academic institutions.

Membership includes the responsibility to attend Committee meetings personally. The Secretary of the U.S. Department of the Interior may replace any member who is unable or unwilling to participate in Committee meetings. Substitutes or alternates will not be permitted to represent Committee members without prior written agreement of the Designated Federal Officer (DFO).

Section IV: Role of Committee Officials:

Designated Federal Officer: The DFO serves as the U.S. Department of the Interior's agent for all matters relating to the Committee's activities. By law, the DFO must: (1) approve or call the meeting of the Committee; (2) approve agendas; (3) attend all meetings; (4) adjourn the meeting when such adjournments are in the public interest; and (5) chair meetings of the Committee when so directed by the agency head.

In addition, the DFO will provide staff support to the Committee, including staff to perform the following functions: (1) notify members of the time and place for each meeting; (2) maintain records of all meetings, as required by law; (3) maintain the roll; (4) prepare the minutes of all meetings of the Committee; (5) attend to official correspondence; (6) maintain official Committee records and file all papers and submissions prepared for or by the Committee, including those items generated by Subcommittees; (7) act as the Committee's agent to collect, validate, and pay any vouchers for pre-approved expenditures; and, (8) prepare and handle all reports, including the annual report as required by FACA.

Vice-Chair: The DFO/Chair shall appoint a Vice-Chair to assist in presiding at meetings, establishing priorities, and determining the levels and types of financial and staff support needed by the Committee. The Vice-Chair shall carry out the duties of the DFO/Chair in the Chair's absence.

Alternate Vice-Chair: The DFO/Chair shall appoint an Alternate Vice-Chair, to assist the DFO/Chair and the Vice-Chair in presiding at meetings, identifying issues which must be addressed, and determining the levels and types of financial and staff support needed by the Committee. The Alternate Vice-Chair shall carry out the duties of the Vice-Chair in the Vice-Chair's absence.

Steering Committee: The DFO/Chair, in consultation with the Vice-Chair and the Alternate Vice-Chair, may establish a Steering Committee of not more than eight members, including the DFO and either the Vice-Chair or the Alternate Vice-Chair, to assist with organizational and administrative matters, such as meeting planning. Steering Committee meetings will not be open to the public, and the Steering Committee will not consider substantive matters or provide advice directly to the U.S. Department of the Interior.

Section V: Meeting Procedures:

The Committee will meet at least twice a year. Meetings will be called by the DFO in consultation with the Vice-Chair and the Alternate Vice-Chair, and will proceed in accordance with the following considerations:

Agenda: The DFO will approve the agenda for all meetings, in consultation with the Vice-Chair and the Alternate Vice-Chair. The DFO will distribute the agenda to the members prior to each meeting and will publish a summary of the agenda with the notice of the meeting in the Federal Register. Agenda suggestions may be submitted to the DFO and/or the Vice-Chair or the Alternate Vice-Chair by any member of the Committee. Agenda suggestions may also be submitted by non-members, including members of the public.

Minutes and Records: The DFO will prepare minutes of each meeting. The minutes will include: (1) the time, date and place of the meeting; (2) a record of the persons present (including the names of Committee members, members of Committee staff, and the names of members of the public who made written or oral presentations; and (3) a description of the matters discussed and conclusions reached, including copies of all reports or other documents received, issued, or approved by the Committee at the meeting.

The accuracy of the minutes shall be certified by the DFO after review by the Committee in accordance with FACA. The original copy of the minutes of the proceedings will be maintained in the Library at Headquarters of the United States Department of the Interior in Washington, D.C. In addition, a copy of the minutes will be made available to the public on the Committee's Web page.

Open Meetings: Unless otherwise determined in advance, all meetings of the Advisory Committee will be open to the public. Once an open meeting has begun, it will not be closed for any reason. All materials brought before, or presented to, the Advisory Committee during the conduct of an open meeting, including the minutes of the proceedings of an open meeting, will be made available to the public for review or copying at the time of the scheduled meeting or as soon thereafter as possible.

Members of the public may attend any meeting or portion of a meeting that is not closed to the public, and may, at the determination of the DFO, offer oral comment at such meeting. Members of the public may submit written statements to the Committee at any time.

Closed Meetings: Meetings of the Committee will be closed only in limited circumstances, in accordance with applicable law. In addition, any request for a closed meeting must be approved by the Committee Management Officer (CMO) 30 days in advance of the session. Steering Committee meetings will not consider substantive matters, and will not be open to the public. However, minutes of Steering Committee proceedings will be available to the public in the same manner as minutes of the proceedings of the full Committee.

Section VI: Subcommittees:

The DFO/Chair may establish Subcommittees from among the Committee membership, State, Federal, or Tribal agencies, or the public to assist the Committee on specific issues. Subcommittees shall report to the Committee only; they shall not report to the DFO/Chair or to the U.S. Department of the Interior. Meetings of Subcommittees are not subject to the Federal Advisory Committee Act, and will not be open to the public. However, any working papers, data, or other information used by the Subcommittee as part of their analysis or recommendation shall be given to the DFO as Committee Records, and shall be handled in accordance with Section V of these Bylaws.

Section VII: Deliberations:

The Committee will seek to reach consensus on any advice and recommendations that it is asked to provide. Pre-consensus draft materials, opinions, or advice shall not be considered to be nor characterized as consensus products of the Committee. If the DFO/Chair, in consultation with the Vice-Chair and the Alternate Vice-Chair, determines that a consensus will not be reached, the DFO/Chair may request a motion for a vote on an issue. Those Committee members present and voting will constitute a quorum. If a vote is taken, the DFO/Chair may decide to provide majority and minority opinions.

Section VIII: Amendments:

Any Amendments to these Bylaws must conform to the requirements of FACA. Advance notice of proposed Amendments must be given to all Committee members before any action is taken to amend the Bylaws.

Membership

Natural Resource Damage Assessment and Restoration Advisory Committee

Membership List

U.S. Department of the Interior Representatives	
Frank M. DeLuise, Program Manager Natural Resource Damage Assessment and Restoration Program Washington, DC	John Carlucci, Attorney Office of the Solicitor Division of Parks and Wildlife Washington, DC
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