

Financial Assurance Rules and Natural Resource Damage Liability: A Working Marriage?

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Abstract

The study explores challenges associated with, and the feasibility of, financial assurance requirements for liabilities arising under U.S. environmental statutes, with a particular emphasis on liabilities associated with natural resource damages (NRDs). The overlap between federal NRD liability and financial assurance arises in the context of two financial assurance rules: one for waterborne vessels that carry oil or hazardous substances, and one for offshore facilities used for oil exploration, drilling, production, or transport. The report addresses the rules' history, their role as a complement to other forms of environmental regulation, and their impact on the regulated community and providers of coverage. Despite numerous difficulties and over objections from the regulated community, the rules have been implemented with success and without significant shortfalls in coverage availability.

Key Words: financial assurance; financial responsibility; natural resource damages; liability

JEL Classification Numbers: K13, K32, Q38

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James Boyd*

1. Introduction

Financial assurance rules, also known as financial responsibility requirements, are an increasingly common component of environmental regulation.¹ The rules require potential polluters to demonstrate financial resources adequate to compensate society in the event of environmental damage. Complemented by liability law, financial assurance fosters the internalization of social costs by polluters. Liability alone achieves cost internalization only in theory. In practice, liability laws, and other after-the-fact penalties,² suffer from an important weakness: since financial damages are imposed only after environmental damage has occurred, defendants can escape cost internalization via bankruptcy, prior corporate dissolution, or the sheltering of assets overseas. Financial responsibility rules counter this weakness.

The objective of the study is to explore the challenges associated with, and the feasibility of, mandatory financial assurance requirements (FARs) for liabilities arising under U.S. environmental law. The paper gives an overview of financial assurance rules but focuses on financial assurance for liabilities associated with natural resource damages (NRDs). It gives particular emphasis to the rules' history, their role as a complement to other forms of environmental regulation, and their impact on the regulated community and providers of coverage.

1.1 Financial Assurance in the United States

Although FARs have existed for decades under U.S. law, it is only in the past decade that their implementation has become widespread. Current FAR programs also require significantly larger amounts of coverage than did previous programs.³ At this time, financial assurance regulations are associated with several of the most important federal environmental laws. Financial assurance is required under the Oil Pollution Act (OPA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund), the Resource Conservation and Recovery Act (RCRA), the Safe Drinking Water Act, the Outer Continental Shelf Lands Act (OCSLA), the Federal Land Policy and Management Act, and the Surface Mining Control and Reclamation Act (SMCRA). Not all enterprises regulated under

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¹ The terms “financial assurance requirements” and “financial responsibility requirements” are used interchangeably in the report.

² Such as administrative fines.

³ See the discussion of financial assurance requirements under the Clean Water Act, note 100 *infra*.

these laws are subject to FARs, but financial assurance is required for vessels carrying oil or hazardous substances, underground petroleum storage tanks, solid and hazardous waste landfills, many types of industrial wells, oil-drilling facilities, and mining operations.

Although widespread implementation of FAR programs is recent, there is enough experience that we can offer tentative conclusions regarding the challenges and feasibility of implementation in the U.S. context. Perhaps the most important aspect of FAR implementation is the way in which private markets develop to supply the financial instruments used to demonstrate financial responsibility. This paper traces the development of these markets. It also describes the interaction between liability laws, FAR program rules, and the willingness of third-party guarantors to supply financial assurance to these markets. More generally, it offers a detailed overview of the numerous legal, administrative, technical, commercial, and political issues raised by financial assurance regulations.

1.2 The Intersection of NRD Law and Financial Assurance Regulations

There is no specific financial assurance for natural resource damages under U.S. law. Rather, financial responsibility is required for certain commercial operations that are liable for NRDs under OPA and CERCLA. This paper focuses on FARs under OPA and CERCLA because those are the only federal statutes that both make polluters liable for NRDs and require financial responsibility.⁴

It is important to understand, however, that firms are also liable for a host of other damages under OPA and CERCLA, including response costs, removal costs, real and personal property damage, lost profits, and lost government revenue. Thus, financial responsibility under those statutes is not exclusive to NRDs. A further complication is that not all commercial operations regulated under CERCLA and OPA are required to demonstrate financial responsibility.⁵

The financial responsibility required under federal statutes other than CERCLA and OPA should not be confused with financial responsibility for natural resource damages since those laws do not create liability for NRDs per se. For example, laws such as RCRA and SMCRA create liability for site cleanup and restoration costs and require financial assurance for those responsibilities and liabilities. Accordingly, they address the quality of natural resources by ensuring the availability of funds for site cleanup and restoration. This is not equivalent to financial responsibility for natural resource damages, however. As will be explained below, natural resource damage liability is legally distinct from other types of remedial liability. Nevertheless, the goals, implementation, and law of FARs under other statutes are very similar to what is found under OPA and CERCLA.

⁴ As described in Section 3, other statutes and common law rules establish liability for natural resource damages or create authority to restore injured natural resources. Only OPA and CERCLA establish NRD liability and require financial assurance for that liability.

⁵ For example, there is financial responsibility under CERCLA only for “vessels” carrying hazardous substances. But CERCLA has a much broader application, namely the identification, prioritization, financing, and remediation of polluted sites. In general, financial responsibility is not associated with hazardous waste site remediation under CERCLA.

1.3 Organization of the Report

To frame the legal and implementation issues, Section 2 provides a brief overview of the conceptual justification for environmental financial assurance. Section 3 turns to the legal underpinnings of both NRD and environmental liability law in the United States. The section describes in detail the nature of liability under OPA and CERCLA—the federal laws under which NRDs are typically pursued—and explores the treatment of natural resource damages under state laws and U.S. common law traditions.

Section 4 describes the methods and standards used to calculate natural resource damages. Section 5 describes the financial responsibility regulations established by federal agencies under OPA and CERCLA, including the variety of financial mechanisms that can be used to demonstrate compliance.⁶

Section 6 describes a set of concerns raised by insurers and the regulated community. These concerns relate to both the nature of liability under the statutes and the way in which damages are determined. These issues relate to the “insurability” of environmental risks when financial assurance is mandatory. Section 7 describes the market for OPA and CERCLA financial responsibility coverage, including the costs and availability of coverage.

Section 8 briefly summarizes U.S. experience with financial assurance for other environment-related liabilities and restoration costs. Section 9 discusses the degree to which environmental insurance markets are likely to arise in the absence of mandatory coverage rules. Section 10 concludes.

2. The Conceptual Justification for FARs

Financial assurance is a desirable, and in some cases necessary, complement to liability-based laws and other regulatory programs that require some kind of future environmental performance. Although the objectives and features of particular FARs differ for each application, they share a basic motivation: the internalization of costs by polluters in order to provide victim compensation and deter pollution and other forms of environmental degradation.⁷ In addition, FARs can shift the burden of proof for cost recovery from polluters to regulators, which can lower public trustees’ litigation costs.

2.1 Liability and Cost Internalization

Liability for environmental damages is strict under both U.S. common law and the major environmental statutes, such as OPA, RCRA, and CERCLA. Unlike fault-type liability rules, strict liability seeks to impose the full burden of environmental costs on the pollution generator, independent of any precautions taken by the defendant. In principle, strict liability leads to the internalization of otherwise externalized

⁶ There are different implementing agencies for these rules, depending on the type of facility or vessel covered. The U.S. Coast Guard is responsible for implementing FARs applied to vessels carrying oil and hazardous substances. The Minerals Management Service of the Department of the Interior implements FARs applied to fixed offshore facilities, such as oil-drilling rigs and pipelines.

⁷ The report will primarily deal with financial assurance as a complement to pollution liability law. In other situations, however, financial assurance is used as a bond to guarantee performance of reclamation activities when natural resources are degraded by, for instance, oil exploration, mining, logging, or land development. Between the two types of application there are various common legal and implementation issues.

costs. Cost internalization is desirable for both distributive and normative reasons. Strict liability serves distributive goals by providing compensation to victims. It serves normative ones by creating financial incentives that lead to optimal levels of deterrence. However, strict liability fails to induce efficient precaution and effective compensation when firms are undercapitalized relative to the financial obligations implied by their liability.

Insolvency can limit the penalties borne by strictly liable tort defendants and thereby reintroduce the possibility of externalized social costs.⁸ Any such externalization means that potential defendants will not be sufficiently motivated to take precautions against risk.⁹

To compound this problem, firms may actively seek to reduce their exposure to liabilities by divesting themselves of assets. In industries where liability costs are potentially significant, firms' business organization and capital investment and retention decisions may be influenced by the desire to externalize liabilities. For instance, to avoid "deepening their pockets," firms may avoid retained earnings, shelter assets overseas, or choose not to vertically or horizontally integrate.¹⁰

Financial responsibility rules are most desirable when the scale of possible environmental costs is large relative to the value of the firms creating the risks. It is not just the notorious catastrophes, such as oil tanker spills, that signal the need for financial responsibility. Smaller risks, such as tank leaks at filling

⁸ Bankruptcy proceedings do not always limit the ability to recover costs, though they certainly do not foster cost recovery. Generally speaking, debtors are protected from creditors (which can include tort victims) by the "automatic stay" provision of the U.S. bankruptcy code, 11 USC § 362(a). There is, however, a "police and regulatory power exception" to the automatic stay. The exception states that the automatic stay does not apply to the "commencement or continuation of an action or proceeding by a governmental unit to enforce such governmental unit's police or regulatory power," 11 USC § 362(b)(4). Courts have generally held that a CERCLA action is an exercise of the government's police or regulatory power and is not subject to the automatic stay. See generally, Richard L. Epling, Impact of Environmental Law on Bankruptcy Cases, 26 *Wake Forest L. Rev.* 69, 1991.

⁹ For analyses that have explored or employ this reasoning, see Alan Schwartz, Products Liability, Corporate Structure, and Bankruptcy: Toxic Substances and the Remote-Risk Relationship, 14 *J. Legal Stud.* 689, 1985; Steven Shavell, The Judgment-Proof Problem, 6 *Int'l Rev. L. & Econ.*, 45, 1986; William Landes and Richard Posner, *The Economic Structure of Tort Law*, 1987; Lewis Kornhauser and Richard Revesz, Apportioning Damages among Potentially Insolvent Actors, 19 *J. Legal Stud.* 617, 1990; and James Boyd and Daniel Ingberman, Noncompensatory Damages and Potential Insolvency, 23 *J. Legal Stud.* 895, 1994. Note that the mere possibility of bankruptcy is sufficient to weaken liability's ability to deter. The corollary to this statement is that bankruptcy need not already be observed for it to have an effect on a firm's incentives. From the standpoint of *ex ante* decisionmaking, whenever bankruptcy occurs with a positive probability, the incentive to make costly investments in risk reduction is reduced.

¹⁰ To investigate the impact of liability on enterprise scale, Al Ringleb and Steven Wiggins (Liability and Large-Scale, Long-Term Hazards, 98 *J. Pol. Econ.* 574, 1990) explore the rate of small firms' incorporation as a function of the riskiness of a given industry. Their evidence suggests that liability has a direct impact on enterprise scale. They compared the number of small firms in 1967—before the routine use of strict liability for tort claims—with the number of such firms in 1980, when the use of strict liability was routine and expected. Their analysis suggests that the incentive to avoid liability led to a 20% increase in the number of small corporations in the U.S. economy between the two periods. For a description of offshore financial havens, or "asset protection trusts," see Salting It Away, *The Economist*, October 5, 1991, at 32.

stations, can in aggregate create far greater levels of externalized environmental costs because the responsible firms have extremely shallow pockets.

Financial responsibility is also particularly appropriate for dealing with latent risks. Latency, where risks materialize only over a period of years or decades, is a common characteristic of environmental hazards. Without financial responsibility the polluter may cease to exist as a legal entity long before environmental damage is even discovered. In this context, financial responsibility ensures that polluters set aside capital available for damage compensation even after the firm dissolves.

2.2 Financial Assurance as a Performance Bond

When financial assurance is designed to complement liability law, assurance instruments are best thought of as a form of mandatory insurance. However, U.S. environmental law also uses financial assurance as a complement to land reclamation and restoration regulations. Assurance instruments in this context are best thought of as surety, or performance, bonds to guarantee the performance of a known future action. This kind of assurance instrument is used in the United States to guarantee environmentally sound closure of solid waste and hazardous landfills and restoration of surface mine sites.

The motivation for assurance in the bonding context is nearly identical to the motivation for assurance in the liability insurance context. In both cases, the assurance instrument guarantees that operator funds will be available in the future to internalize costs associated with their commercial operations. The main substantive difference is that bond-based assurance guarantees performance of a known regulatory restoration, or other performance, requirement, whereas insurance-based assurance guarantees cost internalization of possible, but more uncertain, costs associated with future liability.¹¹

2.3 Reduced Litigation and Administrative Costs

Financial assurance can also foster timely, relatively low-cost public access to compensation. This can be beneficial when a swift response allows for the minimization of damage. When assurance is held by a public trustee, such as a state regulatory agency, it minimizes the public transaction costs associated with collecting compensation. Even when liability is firmly established, the possibility of appeal, delay, and uncertainties associated with penalty collection can complicate the actual transfer of funds from defendants to plaintiffs. Some financial assurance instruments, such as letters of credit, allow almost instant access by regulators to reserved funds. This shifts the burden of proof from the government to the plaintiff. Instead of the government having to prove that compensation is due and seek the funds, the burden falls to the polluter to demonstrate that they are not liable.¹²

¹¹ For more on the difference between performance bonds and insurance, and for a broad legal overview of performance bonds generally, see Lawrence Moelmann and John Harris, eds., *The Law of Performance Bonds*, American Bar Association, 1999.

¹² The corollary, of course, is that the transaction costs borne by regulated firms will increase. Whether or not this improves overall welfare is a more complex issue. It should also be noted that assurance mechanisms do not always demonstrably improve the government's access to funds.

2.4 The Impact on Firms' Decisionmaking

In concrete terms, financial responsibility ensures that the expected costs of environmental risks appear on a firm's balance sheets and in its business calculations. If new investments imply possible future environmental costs, financial responsibility increases the relevance of these costs to the firm's decisionmaking. To self-insure, firms must have relatively deep pockets and be able to internalize expected environmental costs. Firms with fewer resources often cannot self-insure and must therefore acquire rights to financial assets from third parties, such as banks and insurers. Third-party assurance providers are obviously concerned that their capital will be consumed by future liabilities. As a result, they have a strong incentive to monitor their clients' environmental safety. Capital providers can also base the cost of their capital (e.g., their premiums) on observable attributes of the firms to whom they provide capital. For example, more favorable capital costs can be offered to firms with meaningful risk management and safety programs. In the extreme, financial coverage may be denied altogether to firms that fail to demonstrate acceptable levels of safety. In these ways, the capital markets that arise to satisfy demand for financial responsibility generate incentives to reduce environmental risks.

3. Natural Resources Damages Law

This section describes the legal basis for natural resource damage liability under U.S. law, with particular emphasis on NRDs under OPA and CERCLA. Liability for natural resource (and all other) damages under the statutes is "strict" in that liability is imposed irrespective of precautions, care, safety, or other measures undertaken to guard against injury. Among potentially responsible parties (PRPs), liability is joint and several.¹³ CERCLA bars the retroactive application of liability for NRDs.¹⁴ There is a statute of limitations¹⁵ for the recovery of damages, and a causal link between the defendant's actions and a natural resource injury must also be established.¹⁶

¹³ 33 CFR § 138.30(a). OPA and CERCLA do not explicitly provide for joint and several liability, though joint and several liability is strongly implied (CERCLA, 42 USC 9607; OPA). Court interpretations of the somewhat vague statutory language, however, have established joint and several liability as the rule when damages are indivisible. For a CERCLA case, see *United States v. Chem-Dyne Corp.*, 572 F. Supp. 802 (S.D. Ohio 1983) at 810–811. For an OPA case, see *Sun Pipe Line Co. v. Conewago Contractors, Inc.*, 1994 WL 539326, *8 (M.D. Pa. 1994), citing 136 *Cong. Rec.* H6933-02, H6936 (daily ed. August 3, 1990).

¹⁴ In contrast to its more general liability provisions, CERCLA bars retroactive NRD liability (no NRD liability if the hazardous substance was released before December 1980). CERCLA § 107(f)(1).

¹⁵ The statute of limitations for filing an NRD claim is three years from completion of cleanup at an NPL site, or three years after discovery of NRDs at a non-NPL hazardous waste site. CERCLA, 42 USC 9612(d)(2); OPA, 33 U.S.C 2712(h)(2). As long as NOAA assessment procedures are followed, the statute of limitations for an OPA claim extends to three years after the completion of the NRD assessment.

¹⁶ See *In re Acushnet River & New Bedford Harbor: Proceedings re Alleged PCB Pollution*, 722 F. Supp. 893 (D. Mass. 1989). When there are multiple sources of a release, the natural resource trustees must show that "the releases from a particular facility while owned by a particular defendant were a contributing factor to the natural resource injury for which recovery is sought." This causation requirement is somewhat more demanding than that required for CERCLA response actions generally. The CERCLA strict liability standard divorces the determination of liability from a traditional inquiry into fault. See *United States v. Ottati & Goss, Inc.* 630 F. Supp. 1361 (D. NH, 1985), rejecting the notion that plaintiffs must show that defendant's wastes caused the environmental harm.

3.1 NRDs under Federal Law

Several U.S. environmental statutes establish liability for injury to natural resources. The Deepwater Port Act of 1974 and the Clean Water Act amendments of 1977 introduced NRD liability to federal law.¹⁷ Subsequent to, and in most ways superseding, those statutes, liability for NRDs was established under CERCLA,¹⁸ OPA,¹⁹ and the National Marine Sanctuaries Act.²⁰ These latter statutes significantly expanded the reach and amounts of potential NRD liability. OPA, for example, significantly increased prior liability limits and allowed for the recovery of income lost because of damage to public resources.²¹

3.1.1 The Physical, Legal, and Economic Definitions of NRD

In physical terms, natural resource damages are damages to land, fish, wildlife, biota, air, water, groundwater, and other resources.²² Physical injuries can take a variety of forms but typically relate to adverse changes in the health of a habitat or species population and in the underlying ecological processes on which they rely.²³

In legal terms, the definition of NRDs is restricted to resources that are owned, controlled, or managed by federal, state, or other governmental entities, including foreign governments.²⁴ Damages to pure private property interests are not considered natural resource damages under U.S. law. However, the definition of natural resources is not limited to government-owned resources. What must be demonstrated is a “substantial degree of government regulation, management, or other form of control over the property”

¹⁷ For the CWA, see 33 USC 1251 et seq. Section 311 of the CWA regulates the discharge of oil and other hazardous substances into navigable waters, allows the government to remove the substance, and holds the responsible parties liable for that removal. The removal cost is defined to include “costs for restoration or replacement of natural resources damaged or destroyed.” 33 USC 1321. The Deepwater Port Act of 1974, which preceded the CWA, established liability for damages to natural resources to be recovered by a federal trustee and used for restoration. 33 USC § 1501–1524, 1982.

¹⁸ Section 107 of the act establishes NRD liability and authorizes federal trustees to recover damages for assessing and correcting natural resource injuries. 42 USC 9607(f)(1).

¹⁹ Section 1002 of the act establishes liability for “injury to, destruction of, loss of, or loss of use of natural resources.” 33 USC 2702(b)(2)(A).

²⁰ The NMSA uses the same definition of natural resource damages as OPA, 16 USC 1432. Section 1443 establishes liability and authorizes civil actions to pursue cost recovery.

²¹ The prior limitation on state-imposed liability was created by the Federal Limitation of Liability Act of 1851, 46 USC § 183–189. OPA contains liability limits of its own, as discussed in Section 5.2 *infra*, though these can be breached if the vessel operator is found to have been grossly negligent.

²² OPA 33 USC § 2701(20); CERCLA 42 USC § 9601(16).

²³ 15 CFR 990.52. “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.”

²⁴ CERCLA § 101(16); OPA § 1001(20).

that is injured.²⁵ Accordingly, injuries to natural resources on or associated with private property can lead to NRD claims.

Defendants found liable for NRDs face three primary damage components: first, the cost of resource restoration to baseline conditions; second, compensation for “interim losses,” that is, the lost value of injured resources pending full restoration; and third, the reasonable cost of the damage assessments themselves.²⁶ In some cases, the acquisition of “equivalent resources” can be used as a substitute for restoration.²⁷ NRDs can also arise from natural resource injuries that have not yet occurred. Under both OPA and CERCLA the government has authority to respond to, and recover costs for, “threatened” releases of oil or hazardous substances that pose a danger to natural resources.²⁸

In economic terms, the goal of federal NRD liability is to “make the environment and public whole” following a pollution event.²⁹ In principle, this is straightforward and consistent with legal and economic theories of deterrence that emphasize the desirable consequences of social cost internalization by polluters. In practice, the determination of compensating remedies can be quite difficult. Determining appropriate levels of on-site physical restoration is complex enough, given the technical challenges associated with restoration and the need to estimate baseline conditions against a background of natural variability. In many cases, however, off-site restoration must also be part of the remedy.³⁰ This requires some valuation-based comparison of natural resource services across different sites or across different types of natural resource services. Numerous challenges are associated with this kind of comparison.³¹ Section 4 discusses these issues in more detail.

3.1.2 The Distinction between Remediation and Restoration

To further clarify the nature of natural resource damages, it is useful to distinguish between remedial and restoration actions. Remedial activities are cleanup actions designed primarily to reduce threats to public health. Restoration activities are directed at the recovery of resources themselves. This distinction is clearly evident in CERCLA. Remedial actions are typically undertaken only if a site is placed on the

²⁵ Qualifying resources are “resources the government substantially regulates, manages, or controls”; see *Ohio v. United States Department of Interior*, 880 F.2d 432 (D.C. Cir. 1989), at 460–461.

²⁶ CERCLA § 101(6); OPA § 1001(5), § 1002(b)(2).

²⁷ 33 USC 2706(d)(1)(A).

²⁸ 33 USC 2702(a); 42 USC 9606(a).

²⁹ 15 CFR 990.53.

³⁰ There are two reasons that off-site restoration is typically needed to achieve full social compensation. First, complete physical restoration of the injured resource may be impractical. For instance, complete restoration of a damaged site is often cost prohibitive. If so, some other form of compensating restoration will be pursued, usually involving the enhancement of another comparable, but not identical, resource. Second, interim natural resource service losses must be compensated. Restoration of a site to prerelease conditions does not compensate for these interim losses. Supplemental restoration actions, either on site or off site, must be undertaken to compensate for those types of losses.

³¹ Monetary valuation is one way to make such a comparison. Unfortunately, monetization of the services provided by natural resources is not straightforward because there is no revealed market price for such services.

National Priorities List (NPL).³² The criteria for placement on this list emphasize threats to public health. In contrast, CERCLA restoration authority is the authority to restore or replace natural resources to the conditions that would have existed without the hazardous release.³³ Although NRD claims may be filed under CERCLA for damages at NPL sites, NPL site listing is not a prerequisite.³⁴

3.1.3 Administrative Procedures and Authority

OPA and CERCLA govern NRDs arising from the release of oil and hazardous substances, respectively. When a release occurs, either the U.S. Environmental Protection Agency (EPA) or the U.S. Coast Guard (USCG) has authority over removal responses and other immediate actions. When oil or hazardous substances are released on land, CERCLA and OPA require EPA to investigate and respond. The USCG is responsible for releases taking place in coastal waters, including the Great Lakes. Authority for response to inland waterway releases is divided between EPA and USCG.³⁵ Technical response actions and other procedures to be followed in the event of a release are governed by what is called the National Contingency Plan.³⁶

A different set of agencies is responsible for longer-term damage assessment and restoration activities. Restoration, assessment, and settlement of NRD claims are undertaken by federal, state, and tribal trustees. Only appointed, governmental trustees can seek natural resource damages. Private persons do not have the right to assert claims for natural resource damage.³⁷ The principal federal trustees are the National Oceanic and Atmospheric Administration (NOAA) and the Department of Interior (DOI).³⁸ Two sets of rules guide the agencies' respective NRD assessment procedures.³⁹ These rules also act as a blueprint for the determination of appropriate restoration actions. Accordingly, the damage assessment

³² The U.S. Environmental Protection Agency (EPA) can mandate certain actions, such as temporary relocation of residents, even if a site does not appear on the NPL. Under the National Contingency Plan, however (which establishes rules governing the response to hazardous releases), remedial actions may be taken only at sites on the NPL. 40 CFR 300.68(a).

³³ CERCLA § 107(f)(1); 40 CFR § 300.615(c)(3),(4).

³⁴ At NPL sites undergoing remediation, federal trustees can seek payment for NRD claims only if damage remains after site cleanup is complete. Remaining injuries could include residual contamination, reduced animal populations, and reduced habitat quality. See GAO, *Outlook for and Experience with Natural Resource Damage Settlements*, GAO/RCED-96-71, April 1996, at 4–5.

³⁵ 40 CFR 300.5.

³⁶ 40 CFR 300.

³⁷ *Artesian Water Co. v. Government of New Castle County*, 851 F.2d 643 (3rd Cir. 1988).

³⁸ The Departments of Agriculture, Defense, and Energy can also be trustees, 40 C.F.R. § 300.600. State and tribal trustees vary and are designated by the governor of each state or by tribal chairmen, 40 C.F.R. § 300.605, 610. Under OPA, foreign officials can also act as natural resource trustees for foreign resources. OPA § 1006(a)(4),(b)(5).

³⁹ 15 CFR 990 (the NOAA regulations); 43 CFR 11 (the DOI regulations).

rules, together with the analysis of a specific site, largely determine the nature and scale of NRD recoveries.⁴⁰

3.2 NRDs under State Law

Many states have their own natural resource damage laws.⁴¹ In some cases, the liabilities arising under state law can significantly expand upon federal liability. An important feature of OPA and CERCLA is that they do not preempt any state NRD laws.⁴² Currently more than half the states have independent statutory authority to pursue NRDs.⁴³ In most cases, however, state claims are pursued through federal law,⁴⁴ and at least until the mid-1990s, few state NRDs had been recovered.⁴⁵

State NRD laws can differ from federal law in interesting and important respects. For example, in contrast to federal NRD law, state NRD laws do not always cap liability.⁴⁶ Some states expand recovery to economic damages resulting from natural resource injury—costs that are sometimes, but not always, recoverable under OPA and CERCLA.⁴⁷ Some states limit the methodologies that can be used by states to calculate the scale of NRDs. An example is Michigan’s prohibition against use of the contingent valuation (CV) method to determine damages.⁴⁸ The use of damage recoveries in some states also differs from

⁴⁰ This should not be taken to suggest that recoveries are easily calculated via reference to an objective, unambiguous schedule of damages. The legal and technical uncertainties surrounding NRD assessment imply that PRP–trustee bargaining, as much as objective criteria, will determine the ultimate scale of financial damages. The damage assessment rules are discussed in more detail in Section 4.

⁴¹ In some states—Pennsylvania, for example—even municipalities can sue for NRDs. 35 PA. Cons. Stat. Ann. 6020.507(a).

⁴² This is explicitly stated under OPA § 1018: “Nothing in this Act...shall affect, or be construed or interpreted as preempting, the authority of any State or political subdivision thereof from imposing any additional liability or requirements with respect to the discharge of oil or other pollution by oil within such State...”

⁴³ As of 1995, one survey found that 28 states had passed laws authorizing NRD recovery. Environmental Law Institute, *An Analysis of State Superfund Programs: 50-State Study, 1995 Update*. ELI Project #941724. p. 46. For a more recent but somewhat less complete state survey, see Association of State and Territorial Solid Waste Management Officials, *Survey of State Remedial Program Activities in Natural Resource Damages*, February 1997, at <http://www.astswmo.org/Publications/ascii/nrdsur.txt>.

⁴⁴ States may recover NRDs under federal authority (CERCLA) at non-NPL sites within their jurisdictions. See Association of State and Territorial Solid Waste Management Officials, note 42 *supra*, which found that 30 of 38 states responding pursued NRD claims through federal law.

⁴⁵ According to the ELI report, note 42 *supra*, as of 1995, only eight states had recovered NRD claims under their statutes. However, it is likely that this number has expanded significantly in recent years.

⁴⁶ New Jersey is an example. NRD assessments are required under New Jersey law during any remedial investigation of a hazardous waste site. N.J.A.C. 7:26E-4.7. The Spill Compensation and Control Act establishes liability for NRDs, with no cap on liability. N.J.S.A. 58:10-23.11(u)(b)(4). In other respects the state’s law is similar to the federal, such as the definition of natural resource injury (N.J.A.C. 7:26E-1.8). And the state uses the U.S. DOI’s assessment guidelines.

⁴⁷ See *Ballard Shipping Co. v. Beach Shellfish*, 32 F.3d 623 (1st Cir. 1994), where shellfish dealers were able to recover economic damages under state law.

⁴⁸ Michigan law establishes liability for natural resource injury (Act 451, MCL 324.20126a). However, contingent valuation methods cannot be used for damage calculations “unless a determination is made by the department that

federal rules. Federal rules favor on-site restoration, but some states allow for “pooled” compensation, whereby monetary recoveries are applied to restoration at other sites.⁴⁹ A variety of other differences exist, but a comprehensive survey of state laws is beyond the scope of this report.

3.3 NRDs and Citizens’ Standing to Sue

The ability of individual citizens or nongovernmental organizations to sue for natural resource damages or injunctive relief is an evolving area of U.S. law. As mentioned earlier, there is no direct private right of action to recover NRDs under federal law.⁵⁰ However, common law principles and federal administrative law extend the scope of possible citizen action.⁵¹

3.3.1 The Common Law Basis

The public trust doctrine is the common law foundation upon which liability for NRDs is based.⁵² Well before the passage of the relevant federal statutes, natural resource damages were collected under common law.⁵³ In fact, the public trust doctrine is a legal concept from Roman law, applied historically to navigation and fishing rights. The doctrine held that the public (usually commercial) interests in navigable waters superseded any private claim to them.⁵⁴ The doctrine has evolved in U.S. common law to represent the more general notion that the public has an explicit legal interest in the nation’s natural resources.⁵⁵ Under U.S. law, these interests are now understood to include the preservation of noncommercial public interests, such as recreation.⁵⁶ As a result, citizens can challenge private or government actions that

such a method satisfies principles of scientific and economic validity and reliability and rules for utilizing a contingent nonuse valuation methods or a similar nonuse valuation methods are subsequently promulgated.” MCL 324.20104(3).

The state of Texas lists a set of acceptable valuation methods. The list includes contingent valuation but requires that contingent valuation studies be undertaken only in accordance with guidelines established by NOAA. 31 TAC § 20.32(f).

⁴⁹ Texas allows this kind of pooled restoration. 31 TAC § 20.41.

⁵⁰ Gregg Spyridon and Sam LeBanc, *The Overriding Public Interest in Privately Owned Natural Resources: Fashioning a Cause of Action*, 6 *Tulane Environmental Law Journal* 287 (1993), citing *Artesian Water Co. v. New Castle County*, 659 F.Supp. 1269, 1288 (D.Del. 1987), aff’d, 851 F.2d 643 (3rd Cir. 1988).

⁵¹ See Barry Breen, *Citizen Suits for Natural Resource Damages: Closing a Gap in Federal Environmental Law*, 24 *Wake Forest Law Review* 851 (1989).

⁵² See James Power, “Reinvigorating Natural Resource Damage Actions through the Public Trust Doctrine,” 4 *NYU Environmental Law Journal* 418 (1995).

⁵³ *State v. Jersey Central Power & Light Co.*, 308 A.2d 671 (N.J. Super. Ct. Law Div 1972), reversed on other grounds, 351 A.2d 337 (N.J. 1976).

⁵⁴ Joseph Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 *Michigan Law Review* 471, 475 (1970). See *Illinois Central Railroad v. Illinois*, 146 U.S. 387 (1892) for an early statement of the principle in U.S. law.

⁵⁵ See *National Audubon Society v. Superior Court of Alpine County*, 658 P.2d 709, 719 (Cal. 1983).

⁵⁶ As in *Matthews v. Bay Head Improvement Association*, 471 A.2d 355, 363 (N.J.), cert. denied, 469 U.S. 821 (1984); *Marks v. Whitney* 491 P.2d 374 (Cal. 1971), concluding that it is in fact unnecessary to define precisely what public use is threatened by a natural resource damage.

threaten the public's interest in natural resources.⁵⁷ The same principle can be used to compel administrative actions by the government to protect resources under their care.⁵⁸ Natural resources are often considered to be "held in trust" by the federal or state and tribal governments. A government's responsibilities as trustee can be challenged by private citizens.⁵⁹ In some cases, a citizen can directly sue a private party that was inadequately regulated by a state agency.⁶⁰

Common law tort and contract principles have also been used to gain private recovery for natural resource injury. When individuals have a significant interest in public resources, they can sue to recover loss of those resources. A common example is when water pollution closes a commercial fishery, as in *Louisiana v. M/V Testbank*.⁶¹ A nuisance action can be brought, usually by a state, but in some cases also by private citizens who can show some individualized injury to themselves.⁶²

3.3.2 The Federal Basis

The Administrative Procedures Act (APA) allows citizens to challenge government administrative actions.⁶³ Governmental actions affecting aesthetic and environmental interests associated with the use and enjoyment of natural resources are well within APA's ambit.⁶⁴ A central issue in such cases is the degree to which a private plaintiff can show a concrete, individual harm to a legally protected interest. Injury to a natural resource alone is an insufficient basis for such a claim.⁶⁵ Nevertheless, because so

⁵⁷ Citizens can sue "for the purpose of vindicating the public trust," *State v. Deetz*, 66 Wis. 2d 1, 13, 224 N.W.2d 407 (1974).

⁵⁸ *Sierra Club v. U.S. Department of the Interior*, 376 F. Supp. 90 (N.D. Cal. 1974).

⁵⁹ For instance, Wisconsin holds the beds of its navigable waters in trust for the use and enjoyment of its citizens. *Muench v. Public Service Comm'n*, 261 Wis. 492, 501 53 N.W.2d 514 (1952).

⁶⁰ *Gillen v. City of Neenah*, case 96-2470, Supreme Court of Wisconsin (July 1998).

⁶¹ 524 F. Supp. 1170, 1173 (E.D.La. 1981), aff'd 752 F.2d 1019 (5th Cir. 1985), cert. denied, 477 U.S. 903 (1986). In legal parlance, the issue decided in *Testbank* was whether the "contractual relational economic loss" suffered by the plaintiffs was recoverable in tort. The case involved the collision of two vessels with the release of toxic chemicals. The pollution led to the government's closure of an area used for commercial fishing and in turn to a commercial loss for the affected fishermen.

⁶² See *International Paper Co. v. Ouellette*, 479 U.S. 481 (1987) where private plaintiffs successfully brought claims based on injury to public resources.

⁶³ APA covers the breadth of federal agency action. "A person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute, is entitled to judicial review thereof." 5 USC 702.

⁶⁴ As in *Sierra Club v. Morton*, 405 U.S. 727 (1972), in which the plaintiff sued under the APA alleging that the U.S. Forest Service erred in granting a construction permit for a ski area adjacent to a national park. The Supreme Court's ruling held that "Aesthetic and environmental well-being, like economic well-being, are important ingredients of the quality of life in our society, and the fact that particular environmental interests are shared by the many rather than the few does not make them less deserving of legal protection through the judicial process," at 734 (though plaintiff's claim failed because of an inability to adequately demonstrate an injury-in-fact).

⁶⁵ See *Lujan v. Defenders of Wildlife* 504 U.S. 555 (1992), which challenged several federal agencies' decisions relating to the use of federal lands. "Respondents mistakenly rely on a number of other novel standing theories...[such as] that any person using any part of a contiguous ecosystem adversely affected by a funded activity has standing even if the activity is located far away from the area of their use" (at 556).

many government actions can have natural resource consequences, the scope for citizen-initiated action is potentially broad.

Moreover, most federal environmental statutes explicitly authorize citizen suits that can lead to injunctive relief and, in some cases, civil damages.⁶⁶ For example, although NRDs are not compensable to individuals under OPA, citizens can file suit to compel a federal agency to fulfill its role as a natural resource trustee.⁶⁷ Similarly, under CERCLA, although only trustees can file suit for recovery of NRDs, citizens can pursue both civil and injunctive remedies against PRPs alleged to be in violation of any CERCLA provision.⁶⁸ Typically, such suits are barred when a government agency is considered to be diligently prosecuting an enforcement action.

Numerous technical difficulties associated with the valuation and prediction of natural resource damages are discussed below. These difficulties should not obscure the fact that legal authority for the collection of NRDs is well established in the United States. As the above discussion suggests, a variety of federal and state laws create liability for damage to natural resources.

4. NRD Damage Assessment and Valuation

CERCLA and OPA directed DOI and the NOAA, respectively, to develop rules governing natural resource damage assessment. This section reviews the development of these procedures and outlines the basic determinants and methods used to value natural resource damage.

But see Justice Blackmun's dissent: "As I understand it, environmental plaintiffs are under no special constitutional standing disabilities. Like other plaintiffs, they need show only that the action they challenge has injured them, without necessarily showing they happened to be physically near the location of the alleged wrong" (at 595).

⁶⁶ A recent Supreme Court case addressed the conditions under which a citizen suit can compel a defendant to comply with regulatory permit violations affecting recreational and aesthetic interests. Even though no environmental harm occurred, the permit violation itself was found to create an injury-in-fact subject to redress (the same issue confronted in *Lujan*, note 65 *supra*). *Friends of the Earth, Inc. v. Laidlaw Environmental Services, Inc.*, 120 S. Ct. 693 (2000).

For a more detailed analysis, see Michael Healy, Standing in Environmental Citizen Suits: *Laidlaw's* Clarification of the Injury-in-Fact and Redressability Requirements, 30 *Environmental Law Reporter* 10455, 10465. "*Laidlaw* would thus appear to permit any person with a proper interest in a resource affected by pollution levels that are illegally high as a result of defendant's statutory violations to show injury-in-fact as long as the person feels injured by that higher level of pollution."

⁶⁷ 33 USC § 2706(g). "Review of actions by any Federal official where there is alleged to be a failure of that official to perform a duty under this section that is not discretionary with that official may be had by any person in the district court in which the person resides or in which the alleged damage to natural resources occurred. The court may award costs of litigation (including reasonable attorney and expert witness fees) to any prevailing or substantially prevailing party." This should not be taken to imply that agencies have a non-discretionary duty to pursue NRDs, however.

⁶⁸ CERCLA § 7002(a); 42 USC § 6972(a); CERCLA § 310(c), 42 USC § 9659. NRDs cannot be collected by private citizens, however. CERCLA permits the recovery of private cleanup costs, but cleanup costs are not considered NRDs. 42 USC 9613(f)(1). For limitations on ability to recover costs, see *Meghrig v. KFC Western Inc.*, 116 S. Ct. 1251, 1253, 1996.

4.1 The Regulatory Development of Assessment Procedures

DOI published damage assessment rules in 1986.⁶⁹ The rules established two basic procedures: Type A for small releases of oil and hazardous waste, and Type B for large and complex releases.⁷⁰ These original rules, published during the Reagan administration, took a relatively narrow view of the types of injuries that were compensable, the scope of compensation, and the methods to be used in damage assessment. The rules strongly favored a market-oriented approach to damages and established a hierarchy of assessment methodologies. If there was a competitive market for the resource, a diminution in the resource's value (the damage) was to be captured by a price change. If this was inappropriate or impossible, standard appraisal methods were to be used. Only when neither of these was determined by the trustee to be appropriate would "nonmarket" procedures be used. Nonmarket procedures have been, and remain, one of the more controversial aspects of NRD law.

In addition, the original DOI rules limited damage awards to the lesser of the resource's replacement cost or the diminution in use value associated with the injury.⁷¹ Moreover, damages were not to include those associated with nonuse values (e.g., option, existence, or bequest values).

Two 1989 cases, *Ohio v. Department of Interior* and *Colorado v. Department of Interior*, forced DOI to revise those rules.⁷² The revised rules were published in 1994. In *Ohio* the court ruled that CERCLA does not in fact mandate a least-cost approach to damages, thus invalidating the "lesser of" damage rule. The court strongly favored the use of restoration as the basis for damages, even if restoration is more expensive than monetary estimates of lost use value.⁷³ Based on the ruling, the current regulations allow for damages based on diminution in value only in cases where restoration is infeasible or where restoration costs are judged "grossly disproportionate" in relation to economic measures of total value, including nonuse value. The *Ohio* court also invalidated the exclusive reliance on market, or economic, definitions of damage.

Under the current rules nonuse values such as option, existence, and bequest values are compensable.⁷⁴ The revised rules acknowledge that "the mere presence of a competitive market [for resources] does not ... ensure the price will 'capture fully' the value of the resource."⁷⁵

⁶⁹ 61 FR 20609, 1986.

⁷⁰ CERCLA sec. 301(c)(2)(A–B). OPA, 33 USC 2706(d). Type A assessment procedures are used for small incidents with limited duration and cost.

⁷¹ 43 CFR 11.35(b)(2–3), 1987. This "lesser of" damage rule is reflective of the common law standard for determination of tort damages.

⁷² *Ohio v. Department of Interior* (880 F.2d 432, 442 (D.C. Cir. 1989) and *Colorado v. Department of Interior* (880 F.2d 481 (1st Cir. 1989). For the purposes of this analysis, the *Ohio* case is more important, since it related to Type B assessment procedures. The *Colorado* case came to broadly similar conclusions regarding the original DOI rules but relates primarily to the more limited Type A procedures.

⁷³ The NRDA rules' current focus on the replacement cost of resources, rather than their estimated market value, is a direct outgrowth of these cases. H.R. Conf. Rep. No. 653, 101st Cong., 2d Sess. 108 (1990). Also, see discussion in Russell Randle, The Oil Pollution Act of 1990: Its Provisions, Intent, and Effects, 21 *ELR News and Analysis* 10119, 1991.

⁷⁴ Compensable value includes "all of the public economic values associated with an injured resource, including use values and nonuse values such as option, existence, and bequest values." 56 FR 19760, April 29, 1991. It should be

The conflict between market-based and nonmarket-based damage valuation procedures reflected in this procedural history should not come as a surprise. Although mainstream economics now accepts the validity of nonuse values at a conceptual level, the methods used to calculate those values remain controversial and subject to huge uncertainties. A remarkable aspect of both OPA and CERCLA is that they have given DOI and NOAA significant latitude to resolve these difficult valuation issues.⁷⁶ First, the statutes are careful to not limit damages to those that can be directly measured in markets or that are based on observable resource uses. Second, as long as the agencies' own damage assessment rules are adhered to, there is a "rebuttable presumption" of the analyses' correctness and legal validity.⁷⁷ Accordingly, the presumption provides agencies with considerable latitude in their choice of damage assessment methods. It has been suggested that Congress included the agency procedural advantage in OPA and CERCLA in order to expand the scale and applicability of NRDs beyond common law damage rules.⁷⁸

4.2 The Current Rules

In 1996, NOAA followed the 1994 DOI rules with rules of its own, to be applied to assessments authorized under OPA.⁷⁹ The rules define the goals of compensation and establish procedures to assess injury, establish causality, and calculate damages. Damage settlement can be arrived at without precise adherence to the rules. Any settlement, however, requires adherence to the broader goals for compensation established by the rules.⁸⁰ Settlements that fail to adhere to these standards can be challenged.⁸¹

noted, however, that the law on recovery of the most speculative values – namely, existence and bequest values – is largely untested.

⁷⁵ 56 FR 19759, 1991.

⁷⁶ It should be emphasized that the difficulties are not related to "financial" or "economic" issues alone. The physical determination of injury itself poses significant technical challenges. For example, it is difficult to establish baseline conditions given natural variability, and the possibility of preexisting contamination. Also, the biological impact of loss of a subset of a biological (species) on a larger community is highly uncertain. The incomplete loss of a community can allow for accelerated biological restoration. As a final example, toxicity measurements for a given release on a given population are themselves a source of uncertainty.

⁷⁷ CERCLA § 107(f)(2)(C); OPA § 1006(e)(2).

⁷⁸ See Frederick Anderson, Natural Resource Damages, Superfund, and the Courts, in *Valuing Natural Assets: The Economics of Natural Resource Damage Assessment*, Raymond Kopp and V. Kerry Smith, eds., Resources for the Future, 1993. "[It is likely that], the rebuttable presumption was placed in the statute specifically in anticipation that the government would adopt regulations that would press well beyond traditional damage awards."

⁷⁹ The rules are codified at 15 CFR 990 (the NOAA rules for OPA damages) and 43 CFR 11 (the DOI rules for CERCLA damages).

⁸⁰ 15 CFR 990.25. "Trustees may settle claims for natural resource damages.. 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 resources and services."

⁸¹ See *Kennecott Utah Copper Corp. v. U.S. Department of Interior*, 88 F.3d 1191 (D.C. Cir 1996), in which the court rejected an inadequate NRD settlement and defined minimal standards that settlements must meet. In

As noted above, the current emphasis is on restoration rather than a monetized estimate of lost value as the measure of damages. Although the “lesser of” rule has been abandoned, cost remains relevant to the determination of remedies. Technical feasibility and cost-effectiveness must be considered in the choice of restoration projects.⁸²

In addition to restoration, however, the rules allow for compensatory damages, which relate to the loss in value experienced between the time of injury and full restoration. As the NOAA rules put it, the goal of the damage assessment is to “make the environment and public whole ... [and is to be] 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.”⁸³

The rules favor restoration over monetary measures largely because restoration costs are easier to estimate.⁸⁴ A restoration cost estimate relies on easily computable capital and labor costs (e.g., the costs of dredging, species reintroduction, or contaminant neutralization). These costs are easier to predict, rely on fewer economic valuation methodologies, and are verifiable *ex post*.⁸⁵ According to a NOAA director,

Earlier damage assessment procedures emphasized determining a monetary value for the loss of use of the injured resources. Criticisms of this approach led NOAA to ... develop regulations that focus on damages measured by the actual cost of restoration.... Focusing on determining the appropriate scale of restoration projects is preferable to focusing on the monetary amount of damages.... Instead of collecting damages, then determining how to spend that money on restoration, the goal of assessment is now focused on timely, cost-effective restoration of the natural resources that have been injured.⁸⁶

The other advantage of restoration is that, by definition, both lost use and nonuse values are eventually restored.

Even with restoration, however, it is necessary to compensate for losses arising in the period between an incident and full restoration—a period that can span decades. Compensation for interim losses, by

particular, the settlement failed to involve restoration, a conclusion the court felt was unwarranted given the trustees’ limited analysis of options.

⁸² 43 CFR 11.82(d).

⁸³ 15 CFR 990.10. For an example, see David Chapman, Nicholas Iadanza, and Tony Penn, Calculating Resource Compensation: An Application of the Service-to-Service Approach to the Blackbird Mine Hazardous Waste Site, NOAA Technical Paper 97-1, October 16, 1998.

⁸⁴ For a discussion of damage assessment challenges, see Rebecca Renner, Calculating the Cost of Natural Resource Damage, *Environmental Science and Technology* 32:3, 1998, p. 86.

⁸⁵ The private sector prefers restoration cost to monetization, largely because of the former’s greater predictability. See Guide to P&I Cover, *The Standard* (http://www.standard-club.com/pubs/g2pi/pub_a_24.htm; accessed July 28, 2000), responding to the NOAA rules: “The final rules are clearly much better than the initial draft rules because they concentrate on restoration. However, the rules still create the very real likelihood that trustees will produce large and speculative claims in the United States in respect of damages to natural resources.”

⁸⁶ Testimony of David M. Kennedy, Office of Response and Restoration, NOAA, before a joint House Hearing, Subcommittees on Coast Guard and Maritime Transportation and Water Resources and Environment, March 24, 1999, <http://www.house.gov/transportation/cgmt/03-24-99/03-24-99memo.htm> (accessed July 13, 2000).

definition, cannot be achieved via restoration. Accordingly, interim losses require a search for comparable restoration actions. Once those have been identified, trustees must then determine “the scale of those actions that will make the environment and public whole.”⁸⁷ The rules describe a variety of methods by which “scaling” can occur. Scaling frequently relies on the concept of ecosystem services. In this view, which is consistent with economic approaches to valuation, natural resources are “assets” that allow for the provision of “services” with social value.⁸⁸ If a resource’s services are identified and the scale of those services estimated, the same can be done for a second resource. Protection, restoration, or enhancement of the second resource can then be defended as a comparable action. The NOAA rules, for instance, refer to both “resource to resource” and “service to service” valuation methods.⁸⁹ In general, there remains a pronounced desire to avoid monetization of losses and gains. Monetization is not prohibited but is rarely favored.⁹⁰

The rules provide trustees with wide latitude to choose among alternative valuation methodologies, including market price-based valuation methods, appraisal methods, hedonic analysis, and travel cost methods.⁹¹ The aforementioned methods are associated with the estimation of use values. As noted earlier, however, the rules explicitly allow trustees to recover lost nonuse values.⁹² The estimation of nonuse values raises significant methodological concerns and is viewed with particular alarm by potentially liable parties. For this reason, a distinguished independent panel was convened in 1993 to assess the validity of the so-called contingent valuation methodology to measure nonuse values. The NOAA Panel established a set of guidelines for the use of CV methods and concluded that CV can provide a valid economic measure of value associated with resources people do not actually use but

⁸⁷ 15 CFR 990.53(d). For the CERCLA rules, see 43 CFR 11.80. “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.”

⁸⁸ 43 CFR 11.71. “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.” 43 CFR 11.70: “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 provided by the injured resource...”

⁸⁹ 15 CFR 990.53(d)(2).

⁹⁰ 15 CFR 990.53(d)(3)(ii). “If valuation of the replacement natural resources and/or services cannot be performed within a reasonable timeframe or at a reasonable cost...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.”

⁹¹ 43 CFR 11.83.

⁹² 43 CFR 11.83; 15 CFR 990.30. “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.”

whose existence they may nevertheless value.⁹³ The rules now permit CV for estimating use and nonuse values but only when “no use values can be determined.”⁹⁴

Currently, DOI is contemplating revisions to its NRD assessment rule, including a reduced role for methodologies that economically quantify damages, in favor of resource-based measures.⁹⁵ Within the private sector the rules remain controversial, with regular calls for clearer definitions of restoration and the elimination of nonuse claims and interim loss compensation.⁹⁶ It should be noted that the most controversial valuation methods, such as CV, have in actuality been employed infrequently.⁹⁷

5. Financial Responsibility for Natural Resource Damages

OPA and CERCLA both establish NRD liability and require financial assurance for certain commercial enterprises. The overlap between federal NRD liability and financial assurance arises in the context of two financial assurance “rules” implemented by the U.S. government. The first rule, authorized by both OPA and CERCLA, governs waterborne vessels that carry oil or hazardous substances.⁹⁸ The second rule, authorized by OPA, governs offshore facilities used for oil exploration, drilling, production, or transport.⁹⁹ As noted in Section 1.2, firms are liable under OPA and CERCLA for a variety of damages, including NRDs. Financial responsibility is not for NRDs alone.

Before the passage of OPA and CERCLA, financial responsibility was required for vessels carrying oil and hazardous cargo under the Federal Water Pollution Control Act,¹⁰⁰ for offshore facilities under OCSLA, and for oil pipelines under the Trans-Alaska Pipeline Act. The rules described below, however,

⁹³ The panel concluded that “[contingent valuation] produces estimates reliable enough to be the starting point of a judicial process of damage assessment, including passive-use values (i.e., nonuse values).” Report of the NOAA Panel on Contingent Valuation, 58 FR 4601, January 15, 1993, at 4610.

⁹⁴ 43 CFR 11.83(c)(2)(vii).

⁹⁵ Interior Department Revises NRDA Rule to Lessen Focus on Economic Impact, *Environmental Policy Alert*, September 6, 2000, pp. 7–8.

⁹⁶ See statement of George Mannina, Director, Coalition for NRD Reform, before the U.S. Senate Committee on Environment and Public Works, September 4, 1997, http://www.senate.gov/~epw/105th/man_9-04.htm. “If the resource is fully restored, what are past lost use and nonuse monies for? The answer is that they are surplus to the actual cost of restoration and are punitive damages.... Trustees are going to attempt to compute the value to the squirrel of having to eat acorns instead of walnuts while restoration is occurring, or the value to a robin of eating bugs instead of worms—and to file claims for the robin’s pain and suffering.”

⁹⁷ See testimony of Douglas Hall, NOAA, Subcommittee on Water Resources and Environment, House of Representatives, July 11, 1995. “There have only been six contingent valuation studies completed to date, and only one in which the Federal Government was involved in litigation.”

⁹⁸ 33 USC § 2702; 42 USC § 9607(a)(1). The vessel financial responsibility rules are codified at 33 CFR, Part 138.

⁹⁹ OPA § 1016. The offshore facility financial responsibility rules are codified at 30 CFR, Part 253.

¹⁰⁰ FWPCA, Section 311, 33 USC 1321 (1970).

apply to a wider range of vessels and facilities, cover a wider range of damages, and require higher levels of coverage than earlier rules.¹⁰¹

5.1 Overview of the Rules

Financial assurance rules for vessels and offshore facilities describe, among other things, implementation schedules, types of facilities to which the rules apply, financial instruments with which compliance can be achieved, and enforcement procedures.

Full implementation of the rules has occurred only recently. The vessel rules were first outlined in 1991. An interim rule followed in 1994, and the rule was finalized in 1996.¹⁰² Deadlines for compliance, which depended on the type and size of vessel, occurred between 1994 and 1997.¹⁰³ Notice of the offshore facilities rule was given in 1997 and finalized in 1998.¹⁰⁴ Compliance for all regulated facilities had to be demonstrated by 1999.

The vessel rule applies to tank vessels of any size, foreign-flag vessels of any size, and mobile offshore oil- and gas-drilling units.¹⁰⁵ Some smaller commercial vessels, such as barges not carrying oil or hazardous substances, are excluded from the regulations. The offshore facility rule applies to facilities “in, on, or under” navigable waters. Covered facilities include platforms, terminals, refineries, and pipelines used for oil exploration, drilling, and production.¹⁰⁶ Onshore oil facilities are not covered.

The vessel rule is administered and enforced by the USCG, and the offshore facility rule, by the Minerals Management Service of DOI. Failure to produce evidence of financial responsibility can trigger monetary penalties of \$25,000 per day in violation.¹⁰⁷ Vessels can be denied entry to ports or other U.S. waters, and cargo can be seized.¹⁰⁸ Offshore facilities can be shut down, drilling permits denied, and future offshore activities prohibited.¹⁰⁹ Enforcement actions are not uncommon.¹¹⁰

¹⁰¹ For instance, the Clean Water Act § 311(f) limited liability to \$150 per vessel ton. The corresponding limit under OPA is \$1,200 per gross ton. Moreover, before OPA there were traditional admiralty shipowner liability protections that limited the application of liability to negligent parties and situations in which plaintiffs were “physically impacted or touched by the oil.” The Outer Continental Shelf Lands Act had a \$35 million FAR for certain oil and natural gas facilities. OPA increased the required amounts (to as much as \$150 million) for some facilities.

¹⁰² 56 FR 49006, September 26, 1991 (notice of proposed rulemaking); 59 FR 34210, July 1, 1994 (the interim rule); and the final rule, Financial Responsibility for Water Pollution (Vessels), codified at 33 CFR 138; Final Rule, 61 FR 9274, March 7, 1996, and 61 FR 9263, March 7, 1996.

¹⁰³ 59 FR 34212-34213. 33 CFR 138.15.

¹⁰⁴ 62 FR 14052, March 25, 1997 (notice of proposed rulemaking); and the final rule, codified at 30 CFR, Part 253, Oil Spill Financial Responsibility for Offshore Facilities, 63 FR 42699, August 11, 1998.

¹⁰⁵ 33 CFR 138.12.

¹⁰⁶ 30 CFR 253.3.

¹⁰⁷ OPA § 2716(a); CERCLA § 9609.

¹⁰⁸ 33 CFR 138.140

¹⁰⁹ 30 CFR 253.51

5.2 Required Coverage and Liability Limits

OPA and CERCLA require financial responsibility coverage for amounts up to the statutory liability limit. Accordingly, the liability limits are identical to the financial responsibility coverage requirements.

Vessel liability limits are a function of the vessel's size and type of cargo (oil vs. hazardous substances).¹¹¹ For large vessels, the limit (and coverage requirement) is \$1,200 per gross ton for oil cargo and \$600 per gross ton for hazardous substance cargo. Vessels that carry both oil and hazardous substances must demonstrate coverage for both amounts.¹¹² For example, for a 50,000-ton tanker that carries both oil and hazardous substances, the required coverage would be \$90 million (50,000 × \$1,800). Vessel coverage requirements are given in Table 1.

Table 1. Required Vessel Coverage

<i>Statute</i>	<i>Vessel type</i>	<i>Size</i>	<i>Coverage required</i>
OPA	Tank vessels	300 to 3,000 tons	Greater of \$2,000,000 or \$1,200 per ton
	Tank vessels	3,000 or more tons	Greater of \$10,000,000 or \$1,200 per ton
	Nontank vessels	300 to 3,000 tons	Greater of \$500,000 or \$600 per ton
CERCLA	Vessels carrying hazardous cargo	300 or more tons	Greater of \$5,000,000 or \$300 per ton
	All other vessels	300 or more tons	Greater of \$500,000 or \$300 per ton

Offshore facility liability limits are based on calculations of the volume of a “worst-case” oil spill. As a rule of thumb, the worst-case discharge is approximately equal to four times the estimated uncontrolled first-day discharge.¹¹³ The only exempted facilities are those with an estimated worst-case oil discharge of 1,000 barrels or less. Precise coverage requirements are summarized in Table 2.¹¹⁴

¹¹⁰ Vessels are routinely turned away from U.S. waters for failure to demonstrate financial responsibility. As an illustrative statistic, between 1995 and early 1999, 37 vessels were detained in U.S. waters until FAR evidence was provided. Testimony of USCG Admiral James Loy before the House of Representatives, Subcommittees on Coast Guard and Maritime Transportation and Water Resources and Environment, Joint Hearing, Oil Pollution Act of 1990, March 24, 1999, <http://www.house.gov/transportation/cgmt/03-24-99/03-24-99memo.htm> (accessed July 13, 2000).

¹¹¹ See 33 CFR § 138.80(f)(3).

¹¹² 33 CFR 138.80. “[T]he total applicable amount is the maximum applicable amount under paragraph (f)(1) of this section plus the maximum applicable amount under paragraph (f)(2) of this section.”

¹¹³ 63 FR 42707, August 11, 1998.

¹¹⁴ 30 CFR 253.13.

Table 2. Required Offshore Facility Coverage

<i>Statute</i>	<i>Location</i>	<i>Worst-case oil discharge volume</i>	<i>Coverage requirement</i>
OPA	Outer Continental Shelf	1,000 to 35,000 barrels	\$35,000,000
		35,000 to 70,000 barrels	\$75,000,000
		70,000 to 105,000 barrels	\$105,000,000
		More than 105,000 barrels	\$150,000,000
	Not in Outer Continental Shelf	Same as above, except 1,000 to 10,000 barrels	\$10,000,000

Although the FAR is equal to the limit of liability, defendants can be liable for greater amounts. There is no limit to liability if a release or threatened release is determined to be caused by “gross negligence or willful misconduct of, or the violation of any applicable Federal safety, construction, or operating regulation by, the responsible party” or if the incident is not reported in a timely fashion.¹¹⁵

Nevertheless, the FAR is only for the predetermined liability limit. And the liability of guarantors (the third parties guaranteeing coverage) is limited to amounts specified in contract, which in no case would be greater than the coverage requirement.¹¹⁶

5.3 Are Coverage Limits Appropriate?

From a public policy standpoint, the choice of liability limits reflects a trade-off. On one hand, by truncating damage awards, liability limits reduce uncertainty. Reduced uncertainty can be expected to reduce the costs of insurance (above and beyond the cost reductions implied by the limitation itself) and thus may promote the development of the market for third-party assurance mechanisms. From the standpoint of regulated firms, liability limits also discipline the government’s pursuit of claims they may feel are unsubstantiated. Accordingly, liability limits may ameliorate political opposition to financial responsibility rules. On the other hand, these practical and political benefits must be weighed against the obvious drawback of liability limits: that environmental costs will continue to be externalized by polluters.

It is difficult to ascertain whether the liability limits established under U.S. law are optimal in a legal or economic sense. Lowered liability limits will reduce compliance costs and improve insurability. Lowered limits will also reduce deterrence and make cost recovery more difficult. Given the relatively recent implementation of these rules, it is difficult to draw a firm conclusion regarding the desirability of the limits established under these programs. Still, we might say that in some cases the limits may be too low, for two reasons. First, as described below in Section 7, insurance availability problems associated with U.S. financial assurance rules have largely failed to materialize. Second, in a number of cases, the liability limits have turned out to be insufficient to fully internalize damages. In fact, the first major post-OPA oil

¹¹⁵ 33 USC § 2704(c)(1).

¹¹⁶ 42 USC § 9608(d).

spill case led to injuries valued at \$90 million. The liability limit, however, was only \$10 million.¹¹⁷ In this case, as in several others, criminal convictions have been sought largely as a means to remove the defendant's liability limits. According to one report, liability limits have been exceeded in seven vessel spills since 1990.¹¹⁸

5.4 Allowable Mechanisms

There are four “allowable mechanisms” that can be used by firms to demonstrate the existence of coverage: insurance, surety bond, self-insurance, and financial guaranty.¹¹⁹ All four mechanisms are designed to ensure that liabilities can be satisfied up to the statutory coverage requirements given above.

5.4.1 Insurance and Surety Bonds

Insurance and surety bonds are financial commitments, purchased from third parties, guaranteeing payment of claims arising from liabilities of the purchaser. Generally speaking, insurance contracts “pay out” when a liability claim arises. Surety bonds are somewhat different in that the risk of loss remains with the principal (rather than being transferred to an insurer). The surety pays out only when the principal defaults.¹²⁰ In most other respects, however, these two instruments are substantially similar.

The vessel and offshore facility rules require that insurance and surety bond contracts adhere to a format established by the regulations. First, all mechanisms must include an “acknowledgment of direct action.” This acknowledgment states that “the insurer [or surety] consents to be sued directly with respect to any claim.”¹²¹ The direct action provision is designed to foster the quick resolution of trustee claims and access to recoveries. In practice, direct action allows cost recovery independent of a defendant's bankruptcy status.¹²² OPA and CERCLA also curtail the defenses available to guarantors. For example, although “willful misconduct of the insured” is a guarantor defense, fraud and misrepresentation on the part of the insured are not.¹²³ The instruments also feature a required cancellation clause: USCG or Minerals Management Service must be notified at least 30 days prior to the cancellation of coverage.

¹¹⁷ See Brent Walth, Spill Laws Fail to Halt Seepage of Public Cash, *The Oregonian*, February 27, 2000.

¹¹⁸ *Idem*. Reporting on a statement from Daniel Sheehan, Director, National Pollution Funds Center, USCG. An interview with George Silva, National Pollution Funds Center, USCG confirmed that barges (which have relatively low liability limits) have been the most common source of injuries exceeding liability limits.

¹¹⁹ The mechanisms are described at 33 CFR 138.80 (for vessels) and 30 CFR 253.28-31 (for offshore facilities).

¹²⁰ *Schmitt v. Insurance Co. of North America* (1991) 230 Cal.App.3d 245, 257. Typically, though, either the principal or the surety may be sued on a bond, and the entire liability may be collected from either the principal or the surety. This characteristic of surety bonds is also tempered by FAR “direct action” requirements, described below.

¹²¹ Appendix B to 33 CFR, Part 138. Also see 30 CFR 253.41(a)(4).

¹²² The offshore facilities rule, for instance, allows direct action against guarantors as long as insolvency is simply “claimed” by the responsible party. In the government's reasoning, “Establishing a regulatory process that might require a lengthy insolvency determination procedure before compensation could begin would be totally inconsistent with [OPA's objectives].” 63 FR 42707, August 11, 1998.

¹²³ 30 CFR 253.41(a)(4); 33 CFR 138.80(d). “There is no evidence that fraud and misrepresentation have been a problem in the current OSFR program.” 63 FR 42707, August 11, 1998.

Moreover, the instruments must specify that “termination of the instrument will not affect the liability of the instrument issuer for claims arising from an incident . . . that occurred on or before the effective date of termination.”¹²⁴ And with respect to litigation, guarantor liabilities survive well past coverage termination.¹²⁵

Not all insurers and sureties are acceptable coverage providers. Surety companies must be certified by the U.S. Treasury Department.¹²⁶ Insurers must “have been found acceptable by and remain acceptable” to USCG to qualify under the vessel rule and must have a “secure” A.M. Best rating under the offshore facilities rule.¹²⁷

Firms are not required to use a single instrument for the entire level of coverage. Different mechanisms can be used in combination, with the aggregate coverage equaling the liability limit.¹²⁸ There are restrictions, however, on the number of third-party guarantors that can participate. Under the vessel rule, no more than 4 insurers or 10 sureties can be used to satisfy a firm’s coverage requirement.¹²⁹ The offshore facility rules place a limit on the number of insurers (either 4 or 5, depending on the facility’s location).

When multiple guarantors execute a guaranty, they are jointly and severally liable but can delineate specific contribution percentages.¹³⁰ Contribution percentages, in insurance parlance, must be “vertical,” not “horizontal.”¹³¹ Vertical contributions associate a specific fraction of liability to a guarantor, irrespective of the dollar value of the claim. Horizontal contributions delineate guarantor liability as a function of the total dollar claim.¹³² Horizontal layering of coverage by different guarantors is prohibited under the rules, apparently because of administrative difficulties associated with that type of contract.¹³³

¹²⁴ 30 CFR 253.41(a)(2).

¹²⁵ “OPA makes guarantors subject to liability for claims made up to 6 years after an oil-spill discharge occurs.” 63 FR 42704, August 11, 1998.

¹²⁶ 30 CFR 253.31; 33 CFR 138.80(b)(2).

¹²⁷ 33 CFR 138.80(b)(1); 30 CFR 253.29(1).

¹²⁸ For example, self-insurance can be used to cover the deductible included in an insurance policy. 63 FR 42704, August 11, 1998.

¹²⁹ 33 CFR 138.80(c)(1).

¹³⁰ 138.80(c)(i).

¹³¹ 30 CFR 253.29(c)(4); 33 CFR § 138.80(c)(1)(j). The offshore facilities rule, however, establishes specific horizontal layers that can be served by different guarantors. Multiple guarantors cannot cover intermediate, horizontal sublayers.

¹³² For example, insurer A is liable for claims up to to \$1 million, insurer B is liable for claims from \$1 million to \$2 million, etc.

¹³³ The issue has been explicitly addressed by MMS: “The reason we placed a limit on the number of insurance certificates and the amounts in the OSFR layers is that in the past we received insurance certificates that did not add up to the total amount of coverage indicated. We found that insurance certificate problems likely would increase with the number of certificates. Many times the problem was associated with ‘horizontal’ layering, which is the allocation of risk within an insurance sub-layer. Verifying that the total amount of the certificate was properly allocated among participating insurers is a burdensome process...” 63 FR 42704, August 11, 1998.

5.4.2 Self-insurance

This mechanism allows companies with relatively deep pockets to satisfy the coverage requirement by demonstrating sufficient financial strength. The vessel rule requires that working capital and net worth both be greater than the coverage requirement. The two measures must be based on domestic assets, presumably to foster cost recovery. Working capital is defined as the value of current assets located in the United States minus current worldwide liabilities. Net worth is defined as the value of all assets located in the United States minus all worldwide liabilities.¹³⁴ When using the financial test, firms must make annual reports that are independently audited according to generally accepted accounting practices. More stringent reporting requirements apply to firms whose net worth is not at least 10 times the applicable amount.¹³⁵ Any changes in a firm's financial status must also be reported.

The offshore facilities rule also includes a domestic asset requirement and mandatory independent audits. Valuation methods for the purpose of demonstrating self-insurability must be the same as those used in the firm's audited financial statements for Securities and Exchange Commission reporting.¹³⁶ The rule requires that the assets used in these calculations be demonstrably unencumbered. The company must specifically identify assets that are unencumbered and tangible (i.e., the assets must be in plant, property, or equipment).¹³⁷

5.4.3 Financial Guaranty (Indemnity)

A financial guaranty (indemnity) agreement allows another firm, such as a parent corporation, to satisfy the coverage requirement. Financial guarantors must themselves pass the corporate financial test and agree to guarantee the liabilities of the potentially liable firm. The requirements are identical to those for self-insurers, including the domestic assets requirement. The vessel rule allows for multiple guarantors (four); the offshore facilities rule does not. In fact, the offshore facilities rule requires that an indemnity agreement be with a single firm that is either a corporate parent or an affiliate. These specific restrictions are the outgrowth of difficulties that arose in an earlier FAR program administered by DOI.¹³⁸

As financial responsibility instruments, self-insurance and financial guaranty are popular with the regulated community, because no third party must be involved and compensated. A common refrain in the regulated community is that the financial tests should be made less stringent, thus allowing a larger number of firms to qualify. However, these instruments are less desirable from a regulatory standpoint.

¹³⁴ 33 CFR § 138.80(b)(3).

¹³⁵ 33 CFR § 138.80(b)(3)(ii).

¹³⁶ 30 CFR § 253.21-.28.

¹³⁷ 30 CFR § 253.26; 63 FR 42703, August 11, 1998.

¹³⁸ See 63 FR 42705, August 11, 1998. "When the USCG first started operating the OCSLA OSFR program in the late 1970s, more than one indemnitor was allowed for any one OSFR demonstration. However, this proved to be unworkable because the failure of any one of the indemnitors could and did cause the failure of the whole package of OSFR evidence," and "If the designated applicant and the indemnitor share non-OSFR business objectives, then the potential for disputes over who will pay a claim should be minimized. Likewise, the corporate affiliate requirement should maximize the potential for timely settlement."

They require more administrative oversight than insurance and sureties, and they provide less of a guarantee that costs will be recoverable in the future. Accordingly, the government has largely resisted any changes to the rules.¹³⁹ The government is also involved in retrospective analyses of insolvency in order to predict the future success of such financial tests.¹⁴⁰

5.5 Financial Assurance for NRDs Associated with Onshore Facilities

The preceding discussion relates to CERCLA and OPA's FARs for natural resource damages arising from vessel and offshore facility spills. CERCLA also appears to include financial responsibility requirements for onshore facilities. Because CERCLA establishes liability for NRD, a reasonable conclusion is that it creates NRD-related FARs as well.¹⁴¹ In fact, however, CERCLA has not resulted in the implementation of such regulations.

The administrative record lacks an explicit rationale for why CERCLA financial responsibility rules covering non-RCRA onshore facilities failed to be promulgated. Certainly, onshore facilities are no less likely than offshore operations to create NRD or other environmental damages. There is every reason to believe that onshore facilities pose equal, if not greater, environmental risks. In fact many, if not most, of the largest ongoing NRD cases in the United States involve damages created by onshore facilities.¹⁴²

Pragmatic and political considerations are the most likely explanation for the lack of CERCLA onshore FARs. The most important consideration is that financial assurance rules are now applied to a large variety of facilities under RCRA subtitles C and D and other federal statutes (these FARs are described in more detail in Section 8). For instance, under RCRA, facilities that treat, store, and dispose of hazardous waste must demonstrate financial responsibility for their operations. Underground petroleum storage tanks and nonhazardous solid waste landfills must also demonstrate financial responsibility. Thus, many of the facilities that may otherwise be targets of CERCLA's provisions are regulated under RCRA instead.

The CERCLA facility provisions clearly indicate that the President was to take into consideration environmental and financial priorities when promulgating any FARs for non-RCRA facilities ("Priority in the development of such requirements shall be accorded to those classes of facilities, owners, and operators which the President determines present the highest level of risk of injury"¹⁴³). One explanation

¹³⁹ See 61 FR 9270, 1996. "The Coast Guard does not consider self-insurance and financial guaranties to be ironclad methods of evidencing financial responsibility. Assets can be dissipated without the Coast Guard's knowledge, and continuous monitoring of a self-insured entity's asset base is not feasible...Accordingly, the Coast Guard believes that any amendment to the financial guarantor provision that reduces the protections afforded by that provision is inconsistent with the concept of financial responsibility."

¹⁴⁰ For instance, MMS did a retrospective analysis of 338 companies over a six-year period to see whether their self-insurance criteria effectively predicted insolvency. 63 FR 42703, August 11, 1998.

¹⁴¹ 42 USC 9608(b)(1). "The President shall promulgate requirements...that classes of facilities establish and maintain evidence of financial responsibility consistent with the degree and duration of risk associated with the production, transportation, treatment, storage, or disposal of hazardous substances."

¹⁴² For summaries and descriptions of cases, see <http://www.darp.noaa.gov/darpcase.htm>.

¹⁴³ *Ibid.*

for the government's failure to introduce such rules is that the highest priority facilities had fallen within RCRA's regulatory ambit.¹⁴⁴ Another explanation relates to the types of risks that would have to be insured under CERCLA onshore FARs.

It is an oversimplification, but EPA generally reserves CERCLA responses for cases that cannot be effectively regulated under other federal statutes. This is why CERCLA typically is applied to so-called orphan sites and sites where liabilities are largely retroactive (i.e., the injury predated passage of the liability law). By contrast, facilities that are ongoing operations are typically regulated under RCRA and other federal statutes. Thus, CERCLA is disproportionately applied to sites with retroactive liabilities and already or potentially insolvent defendants and where there is no ongoing commercial operation. In this type of situation, financial responsibility rules yield little or no benefit. First, if the injury has already occurred, financial responsibility serves no deterrent purpose.¹⁴⁵ Second, financial responsibility does little to improve cost recovery, because any funds that could be secured by regulators should instead be directed immediately toward response actions or the reimbursement of public funds already spent on cleanup.

Finally, political opposition from the regulated community probably played a role in the lack of CERCLA onshore FARs.¹⁴⁶ CERCLA called on the president to consult with the insurance industry while making the financial responsibility determinations.¹⁴⁷ The insurance industry's experience with the insurability of risks associated with CERCLA (particularly those generated by retroactive liability) would have elicited very negative feedback in response to any financial responsibility rulemaking in that area. Retroactive liability and FARs are largely incompatible policy interventions.¹⁴⁸

In sum, there is no particular environmental rationale for the absence of onshore, non-RCRA-facility FARs. Instead, a combination of pragmatic and political factors explain the lack of more widespread FARs for onshore facilities.¹⁴⁹

5.6 State Financial Assurance Requirements

A comprehensive survey of state financial responsibility requirements is beyond the scope of this paper. However, it is worth noting that individual states have NRD-related FARs that in some cases exceed

¹⁴⁴ It is important to note—from the standpoint of an analysis of NRD policy—that RCRA does not establish liability for NRDs. Accordingly, although financial responsibility was established for many onshore hazardous waste facilities under RCRA, RCRA rules do not mandate financial assurance for NRDs.

¹⁴⁵ An exception to this statement is that FAR can act as a bond for performance of a remediation contract or can guarantee that funds are not moved offshore or otherwise dissipated before legal claimants can gain access to them.

¹⁴⁶ Note though, that a range of financial responsibility rules was imposed for certain onshore facilities (e.g., landfills) under RCRA.

¹⁴⁷ 42 USC 9608(b)(2): "To the maximum extent practicable, the President shall cooperate with and seek the advice of the commercial insurance industry in developing financial responsibility requirements."

¹⁴⁸ This issue is discussed in more detail in Section 8.2.

¹⁴⁹ The insurance industry, largely motivated by problems associated with retroactive liability, became a very active opponent of CERCLA's insurance and liability provisions. It is also relevant that the offshore regulations coincided with the aftermath of the *Exxon Valdez* oil spill—an event with clear political ramifications.

those under federal law. For example, California recently passed a law requiring oil-carrying vessels to demonstrate \$1 billion in coverage for oil pollution damages.¹⁵⁰ The law also requires marine terminals, fueling facilities, and barges to demonstrate FAR coverage. Alaska law mandates financial responsibility for oil terminals, pipelines, tank vessels, and barges with coverage levels higher than under federal law.¹⁵¹ In addition, a new Alaska law extends financial responsibility to vessels other than tankers, including cruise ships, and railroad tank cars carrying oil.¹⁵² Similarly, Washington State requires oil vessel coverage in excess of federal requirements and extends the requirements to a broader range of facilities.¹⁵³

6. Concerns of Insurers and Potentially Responsible Parties

The new liability and financial assurance rules created by OPA and CERCLA have a clear impact on PRPs and their insurers. The expansion of liability to natural resource damages alone represents a significant expansion in the reach of the law and the regulated community's expected costs. In the words of the head of USCG,

OPA 90 establishes sharply higher limits of liability for tank vessels, generally \$1,200 per gross ton, compared with \$150 per ton under the Clean Water Act. OPA 90 removes all limits if the incident was caused by gross negligence, willful misconduct, or violations of Federal safety, construction, or operating regulations by the responsible party. In addition, the statute specifically allows individual states to set their own liability limits beyond the Federal limit, furthering the atmosphere of unlimited liability.¹⁵⁴

This "atmosphere of unlimited liability" is clearly of concern to vessel and facility operators. As described earlier, CERCLA and OPA explicitly limit both PRP and underwriter liabilities. Even if the responsible party (the insured) loses its liability limit (for instance, because of its own recklessness), the guarantor's liability remains limited to the contracted coverage.¹⁵⁵ Nevertheless, the joint and several nature of liability, the fact that PRPs may be sued in state as well as federal courts, and the overall increase in liability limits have generated fears of large, unpredictable, and uninsurable liabilities. One industry member explained, "there is fundamental concern about the exposure under OPA 1990 to potentially unlimited liability. We know, of course, that the act retains the principle of limitation. We

¹⁵⁰ California Government Code § 8670.37.53. The law went into effect on January 1, 2000.

¹⁵¹ Some oil terminals and pipelines must demonstrate \$50 million in coverage. Tank vessels and barges must demonstrate up to \$100 million. Alaska Stat. 46.04.040 (Supp. 1994).

¹⁵² Alaska Stat. 46.04.055, as of June 2000.

¹⁵³ The coverage requirement for oil-carrying vessels is \$500 million. Washington Rev. Code Ann. 88.40.020(2)(a). Coverage is also required for onshore facilities that could discharge oil to navigable waters or adjoining shorelines. Washington Rev. Code Ann. 88.40.025.

¹⁵⁴ Statement of U.S. Coast Guard Admiral James Loy, House of Representatives, Subcommittees on Coast Guard and Maritime Transportation and Water Resources and Environment, Joint Hearing, Oil Pollution Act of 1990, March 24, 1999, <http://www.house.gov/transportation/cgmt/03-24-99/03-24-99memo.htm> (accessed July 13, 2000).

¹⁵⁵ 33 USC § 2704(c).

know that there is legal dispute about whether, in fact, legal limitation would be breached in real life.”¹⁵⁶ The range of damages, including NRDs, for which PRPs can be held liable also contributes to the perception that U.S. liability exposures may be particularly large.¹⁵⁷

The response to OPA is illustrative of the alarm with which some in the private sector have received the new rules. The law was predicted to increase the cost of insurance by seven to nine times relative to pre-OPA rates, if insurance was to be available at all. Even more dire predictions included the possibility of a total halt in maritime trade¹⁵⁸ and the collapse of worldwide vessel insurance markets.¹⁵⁹ These predictions have proven to be overblown. Nevertheless, the expansion of liability has meant an expansion in expected costs and greater uncertainty regarding the scale and frequency of claims.

The remainder of this section focuses on more specific concerns relating to the OPA and CERCLA rules. The discussion is divided into two sections: concerns about liability under the financial assurance rules, and concerns about the calculation of NRDs.

6.1 “Direct Action” and Insurer Refusals to Provide Coverage

The most controversial aspect of the OPA and CERCLA financial assurance rules, from the insurer’s standpoint, is a requirement that guarantors of the assurance be liable for “direct action.”¹⁶⁰ The statutes’ direct action requirement eliminates a set of defenses that are typically available to insurers, such as fraud or misrepresentations by the insured.¹⁶¹ In a typical insurance agreement, fraud, misrepresentation, and nonpayment of premiums are grounds for a denial of coverage.¹⁶² OPA and CERCLA remove this

¹⁵⁶ Testimony of Chris Horrocks, International Chamber of Shipping, Hearing before the Subcommittee on Coast Guard and Maritime Transportation of the Committee on Transportation and Infrastructure, House of Representatives June 26, 1996 (hereafter, “1996 House Hearing”), p. 44.

¹⁵⁷ “When oil spills occur in America, they tend to be very expensive events. The costs of responding to a spill, reimbursing those who are injured, and meeting liabilities for injuries to the environment are at least one order of magnitude greater than in the rest of the developed world.” Statement of Thomas Moore, President, Chevron Shipping Company, Subcommittees on Coast Guard and Maritime Transportation and Water Resources and Environment Joint Hearing, Oil Pollution Act of 1990, House of Representatives, March 24, 1999, <http://www.house.gov/transportation/cgmt/03-24-99/03-24-99memo.htm> (accessed July 13, 2000).

¹⁵⁸ See Deadline Near for Compliance with U.S. Oil Spill Liability Rules, *Oil and Gas Journal*, August 1, 1994, p. 14.

¹⁵⁹ Testimony of Chris Horrocks, International Chamber of Shipping, 1996 House Hearing, note 156 *supra*, p. 44.

¹⁶⁰ 33 USC § 2716; 42 USC § 9608(c)(1–2).

¹⁶¹ 61 CFR 9270. “No standard marine liability insurance policy of which the Coast Guard is aware meets [the direct action] requirement.”

¹⁶² For instance, there is an admiralty rule that any evidence of a material misrepresentation cancels insurance coverage. This rule is generally respected in U.S. jurisdictions. See *Port Lynch, Inc. v. New England International Assurety, Inc.*, 754 F.Supp 816, 1992 AMC 225 (W.D. Wash. 1991), upholding the standard. In contrast, however, see *Albany Insurance Co. v. Anh Thi Kieu*, 927 F.2d 882, 1991 AMC 2211 (5th Cir.), at 890, holding that state law should govern the question of what voids coverage and that misrepresentations did not void coverage since insured did not intend to deceive the insurer.

possibility, as do some state laws.¹⁶³ All of the third-party financial assurance mechanisms authorized under the statutes require an acknowledgment that the guarantor agrees to direct action.¹⁶⁴ The only defense available to a guarantor (apart from defenses available to the PRP) is that the loss was caused by the “willful misconduct” of the owner or operator. This rather vague standard provides relatively little security for an underwriter.¹⁶⁵

The direct action provisions of the law are in large part responsible for the withdrawal of most traditional vessel insurers from the OPA and CERCLA financial assurance market. Vessel insurance has historically been provided by the so-called mutual protection and indemnity (P&I) clubs. The P&I clubs continue to provide pollution liability coverage for vessels. Typical P&I vessel policies are for \$500 million with a \$200 million optional cover. The P&I clubs typically cover cleanup, damages (including NRDs), fines, penalties, and legal defense costs. Accordingly, P&I coverages remain the central determinant of the industry’s ability to absorb, and plaintiffs’ ability to recover, pollution liability damages. The P&I clubs will not provide OPA financial assurance, however, and most P&I policies include a “noncertification” clause that reads as follows:

Notwithstanding any other provision of this policy or of any underlying insurance, this policy of insurance is not evidence of financial responsibility under the Oil Pollution Act of 1990 or any similar federal or state laws. Any showing or offering of this policy by the Assured as evidence of insurance shall not be taken as any indication that the Underwriters consent to act as guarantor or to be sued directly in any jurisdiction whatsoever. The Underwriters do not consent to be guarantors or to be sued directly.

The lack of willingness to be OPA guarantors is largely due to the lack of defenses implied by OPA and CERCLA’s direct action provisions.¹⁶⁶

In crafting the vessel and offshore facility rules, the USCG and DOI received many private-sector comments calling for the inclusion of fraud and misrepresentation as an insurance guarantor’s defense.

¹⁶³ 42 USC § 9608(c)(1). “The guarantor may invoke all rights and defenses which would be available to the owner or operator under this subchapter. The guarantor may also invoke the defense that the incident was caused by the willful misconduct of the owner or operator, but the guarantor may not invoke any other defense that the guarantor might have been entitled to invoke in a proceeding brought by the owner or operator against him.” 61 FR 9268. “A guarantor agrees to waive all other defenses, including nonpayment of premium.” For a state law example, see Alaska Statute 46.04.040(e).

¹⁶⁴ 33 CFR 138.80(d)(1). “Any evidence of financial responsibility submitted under this part must contain an acknowledgment by the insurer or other guarantor that an action in court by a claimant for costs and damage claims arising under the provisions of the Acts may be brought directly against the insurer or other guarantor.”

¹⁶⁵ The meaning of the standard has been previously addressed by U.S. courts. See *The Tug Ocean Prince, Inc. v. United States*, 584 F.2d 1151, 1978 AMC 1787 (2d. Cir 1978), cert. denied 440 U.S. 959 (1979): willful misconduct or gross negligence being equivalent to the equally vague “egregious conduct making an accident likely to happen.”

¹⁶⁶ See testimony of Richard Hobbie, President, Water Quality Insurance Syndicate, 1996 House Hearing, note 156 *supra*, p. 40. Also see speech by John D. Kimball to the OPA 90 conference held by Hellenic-American Chamber of Commerce on October 18, 1993 (<http://www.healy.com/newsletters/93nov.htm#item3>): “Some day soon, we may face the oil crisis of 1993 or 1994—a crisis driven not by a shortage of oil or ships, but by a government requirement that insurers become guarantors.”

The government has resisted these calls, however, because the inclusion of defenses would undermine the rules' cost recovery and deterrence goals.¹⁶⁷ According to the Minerals Management Service,

Allowing such a defense is inconsistent with two objectives of the OSFR program: Ensure that claims for oil-spill damages and cleanup costs are paid promptly; and make responsible parties or their guarantors pay claims rather than the Oil Spill Liability Trust Fund. Limiting the types of defenses guarantors may use to avoid payment of claims is consistent with and furthers the achievement of these objectives. Furthermore, there is no evidence that fraud and misrepresentation have been a problem in the current OSFR program.¹⁶⁸

Cost recovery is clearly not served in situations when insurance coverage is unavailable. As for deterrence, direct action creates a powerful incentive on the part of guarantors to police the behavior of insureds.

6.2 Risk, NRD Assessment Methods, and Insurability

As discussed in Section 4, natural resource damages are notoriously difficult to value. Valuation methods that can be applied to marketed goods are in many cases inapplicable in a natural resource damage context. Methods for valuing nonmarketed goods present economists with a raft of conceptual and implementation-related difficulties. On top of this is the paucity of experience with the legal standards that govern the scale of NRDs. As a result, NRDs are difficult to predict. The unpredictability of NRDs, in combination with the need to insure against them, has created a significant degree of discomfort on the part of PRPs and the insurance industry.

Congress has held several sets of hearings related to NRDs and financial responsibility in recent years. These hearings provide an opportunity for PRPs and their insurers to express their concerns and criticisms regarding the NRD and FAR rules, among other things. Many of the comments focus on the high cost of NRD claims and their implication for insurability. Consider the following statements from insurance industry representatives from hearings in 1995 and 1996 relating to NRDs under CERCLA and OPA:

- “Significant reform of the natural resource damage provisions of Superfund needs to occur. We believe the NRD provisions of Superfund have the potential to increase exponentially the economic burdens to our society of this program. We believe it can be accomplished through reasonable and cost-effective methods. In short, there should be responsible limits placed on this form of liability.”¹⁶⁹
- “[We have] practical experience ... of the effect of the *Exxon Valdez* where the natural resource damage claim is well in excess of the limit of our cover and where the effect of that one claim was to increase, for example, the cost of our reinsurance by four times over a period of two years. The

¹⁶⁷ In response to recommendations that fraud and misrepresentation be allowed as an insurance guarantor's defense: “The Coast Guard is not adopting this recommendation because to do so would be inconsistent with the purpose of the guaranty—to ensure that the polluter pays for removal costs and damages...”61 CFR 9270.

¹⁶⁸ 63 FR 42707, August 11, 1998.

¹⁶⁹ Testimony of Robert Burt, FMC Corporation, Senate Environment and Public Works Subcommittee on Superfund, Waste Control and Risk Assessment, April 27, 1995.

expectation of similar claims has maintained the cost of our reinsurance at that new very high level.... That is why we are so apprehensive about the effects that future claims of this kind will have on the continuation of the cover.”¹⁷⁰

- “The average cost of oil spills has rapidly escalated under OPA by a factor of 600–700%. We are seeing that remedial action costs under CERCLA are also on the rise. This has been dealt with by increases in the assureds’ premiums, which, in some cases, put a significant strain on the operators’ abilities to continue in operation. If this trend continues, there are many small and mid-sized companies in the United States which will not be able to continue in business predominantly based on the cost of insurance and compliance with regulations.”¹⁷¹
- “NRD claims like those filed in Coeur d’Alene, \$1.2 to \$1.8 billion; Clark Fork River, \$635 million; Los Angeles Harbor, \$1.2 to \$1.8 billion; and Burk’s \$550 million would bankrupt most companies. Not only does this have a potentially devastating impact on American businessmen and women, but I suspect your colleagues on the Budget Committee would be startled to learn of the potential NRD impact on the Federal Government.”¹⁷²
- “The major uncertainty to the continuation of the [financial responsibility] program is the natural resource damage assessment problem and those regulations, the lack of standards. Should our fears prove true, we may find that no insurers are going to be in a position to issue guarantees.... The dangers posed by potentially excessive and arbitrary assessments present the most serious threat to our ability to continue to insure liabilities under these federal pollution statutes.”¹⁷³

The methods used to calculate NRDs are particularly controversial, as the following testimonies indicate:

- “The liabilities imposed on vessel owners under OPA are subject to dramatic inflation because of the methodologies embraced by agencies of the United States in calculating natural resource damages.”¹⁷⁴
- “Some of the main problems with the NRDA schemes are that the computer models and formulas are flawed and bear no relation to actual events or real world conditions. There are no controls over the cost of making assessments. There is no standard for restoration.”¹⁷⁵

¹⁷⁰ Statement of George Greenwood, Steamship Mutual Underwriting Association, Hearings before the Subcommittee on Water Resources and Environment of the Committee on Transportation and Infrastructure, House of Representatives, July 11, 1995 (hereafter, “1995 House Hearing”).

¹⁷¹ Testimony of Richard Hobbie, Water Quality Insurance Syndicate and American Institute of Marine Underwriters, 1995 House Hearing, note 171 *supra*.

¹⁷² Statement of Kevin McKnight, Coalition for Legislative NRD Reform, 1995 House Hearing, note 171 *supra*.

¹⁷³ Testimony of Richard Hobbie, Water Quality Insurance Syndicate and American Institute of Marine Underwriters, 1996 House Hearing, note 156 *supra*, at 41.

¹⁷⁴ Testimony of Svein Ringbakken, International Association of Independent Tanker Owners, 1996 House Hearing, note 156 *supra*.

¹⁷⁵ Testimony of Richard Hobbie, 1995 House Hearing, note 171 *supra*.

- “Contingent Valuation Methodology seeks to assess the cost to society of natural resource damage, even when no economic loss has been suffered by anyone. This methodology could mean very big bucks in government damage claims. The way damages are calculated is important. If you add to the cost of replacing a tree which was nice to look at an amount to compensate society for the loss of that view, how do you calculate it?”¹⁷⁶
- “[Responsible parties (RPs)] have difficulty recognizing and accepting the concept of damages attributed to past lost uses and interim lost ecological values. Their skepticism is based in part on the economic methodologies used to determine interim lost public values and the difficulty of convincing RP management that such assessments and compensation is necessary. RP management may agree with restoration of what was injured, but damages beyond that often are seen as punitive and unreasonable.”¹⁷⁷

These comments highlight the discomfort with which insurers and the regulated community approach the valuation of NRD claims and the predictability of damage assessment. The law’s requirement that the public be “made whole” following a natural resource injury, combined with the inherent difficulties of natural resource valuation faced by both regulators and the private, creates a significant challenge for insurers. From the standpoint of PRPs and insurers, this problem is best addressed via legislative reform.

6.3 Calls for Legislative Reform

Fear of NRD liability and the problems of NRD insurability have prompted a set of legislative reform proposals, associated primarily with the reauthorization of CERCLA. Although no reforms have been enacted and the possibility of reforms remains in doubt politically, the reauthorization debate provides further evidence of the concerns being raised by the private sector regarding financial responsibility for natural resource damages.

A common feature of the reform bills is the restriction or elimination of recovery for lost nonuse values.¹⁷⁸ Some reform packages prohibit the use of the CV method to value NRDs.¹⁷⁹ Note, however, that none of these reform bills have passed, and there has been significant opposition to weakened NRD

¹⁷⁶ Speech by John D. Kimball to the OPA 90 conference held by Hellenic-American Chamber of Commerce on October 18, 1993, available at <http://www.healy.com/newsletters/93nov.htm#item3>.

¹⁷⁷ See Association of State and Territorial Solid Waste Management Officials, NRD Focus Group, Perspectives on Achieving Cooperation in Assessing Injury and Planning the Restoration of Natural Resources, 1999.

¹⁷⁸ See S.8, Part 403, 105th Cong., A Bill to Reauthorize and Amend the Comprehensive Environmental Response, Liability, and Compensation Act of 1980, introduced January 21, 1997 (there will be “no recovery under this Act for any impairment of nonuse values”), and S.1537, 106th Cong., Superfund Amendments and Reauthorization Act of 1999, introduced in the Senate August 5, 1999.

¹⁷⁹ See S.8, note 178 *supra*, which states that a trustee’s claim for recoverable assessment costs “may not include the costs of conducting any type of study relying on the contingent valuation methodology.”

provisions, including opposition from the Clinton administration and from other administrative agencies.¹⁸⁰

7. The Insurance Market

Despite the fears raised by PRPs and insurers, and despite the continued absence of traditional P&I insurers from the market, a host of financial assurance products are currently available at rates that have been easily absorbed by the regulated community. Some concerns were undoubtedly justified, but it should be noted that none of the worst-case predictions—PRP bankruptcies, failure of the insurance market—came to pass and that many of the fears were exaggerated.¹⁸¹ According to USCG, “The [P&I] clubs’ ... confirmed that [they] had no hard and fast information to support their testimony in July 1994 that the cost of commercial guaranties would greatly exceed the cost of coverage provided by P&I clubs.”¹⁸² While the P&I clubs continue to avoid the financial assurance market, new specialty providers have come into existence and are currently providing coverage at affordable rates.¹⁸³ To date, there have been no complaints regarding these new providers’ ability to provide this specialty coverage.¹⁸⁴

¹⁸⁰ See National Association of Attorneys General, Resolution, Superfund Reauthorization, Adopted June 22–26, 1997, available at http://www.senate.gov/~epw/105th/joh_9-04.htm (accessed July 6, 2000). Also, see Charles Openchowski, Superfund in the 106th Congress, 30 ELR 10648, 10659.

¹⁸¹ Consider an illustrative exchange between Congressman Sherwood Boehlert and Richard Hobbie, an insurance industry representative, during 1995 hearings relating to the fear of bankruptcies in the PRP vessel community (from 1995 House Hearing, note 171 *supra*):

Congressman Boehlert: Do you have any examples of [firms] that have already gone out of business?

Mr. Hobbie: The escalation of costs so far in OPA have been within a context that the maritime industry has been able to sustain. I would suggest that there used to be a larger number of small tow- and push-boat companies all throughout the south intracoastal waterways. Many of those are no longer with us. The larger operators have purchased many of them. If I may, we have had a number of companies who have ceased transporting black oil—that would be Ingram Barge Lines, Bouchard Transportation of New York, and Canal Barge Lines in New Orleans—because of the insurance costs and the liabilities, so I think there would be a direct example where OPA has caused people to change the business pattern.

Congressman Boehlert: But no examples of anybody being forced out of business? I’m being intentional in my pursuit of this because so often we hear these horror stories up here and we are all alarmed and we can’t proceed with anything because the bottom is going to fall out, and then when we ask to see where the bottom has fallen out no one can quite show us where that bottom has fallen out...

¹⁸² Statement of Daniel Sheehan, Director, National Pollution Funds Center, USCG, 1996 House Hearing, note 156 *supra*.

¹⁸³ The P&I insurance market is currently experiencing a period of health, at least on the loss side, which is translating into lower premiums. According to one insurance company circular, “Excess oil pollution cover is again available from market underwriters for the 1999/2000 policy year. As a result of the excellent claims experience and the over capacity in the insurance market it has again been possible to achieve significant reductions in the rating structure.” See http://www.nepia.com/Circulars/excess_oil.htm (accessed July 28, 2000).

¹⁸⁴ “Traditional providers of COFR guarantees declined to provide coverage under the OPA 90 regime, necessitating the emergence of new guarantors. However, since the regulatory program became effective in December 1994, there has not been a single incidence where a guarantor has not met the expectations of the program. The new mix of guarantors has been as reliable as the old mix.” Testimony of James Loy, USCG,

7.1 Compliance Costs

As part of the ongoing rulemaking process, the government has conducted its own analyses of financial assurance compliance costs under the vessel and offshore facility programs. According to USCG, combined annual premiums for vessel coverage were \$70 million in 1996, two years after the program went into effect. This number is significantly lower than the preimplementation worst-case compliance cost estimate of \$450 million per year.¹⁸⁵ Coverage rates vary by the type of vessel and the cargo carried. At the low end, however, small, dry cargo vessels can get millions in coverage for a \$1,000 annual premium.¹⁸⁶

As for the offshore facility program, the annual cost of coverage is estimated at \$6.3 million.¹⁸⁷ According to the government, “90 percent of the 200 designated applicants will demonstrate an average of \$35 million in financial responsibility using insurance or a surety that costs \$35,000.”¹⁸⁸ Annual premiums for \$10 million in OSFR coverage average \$10,000. DOI does “not agree with the comment that the costs of complying with this regulation threaten the viability of many small businesses, because our estimated annual compliance cost is only \$14,000 per business.”¹⁸⁹

7.2 Coverage Availability

Prior to OPA, offshore facilities had to demonstrate financial assurance under OCSLA. OPA had relatively little impact on that market. OPA’s more significant impact was on the market for vessel insurance, particularly given the P&I clubs’ unwillingness to act as OPA guarantors. Since 1994, however, specialty insurers have come into existence to help vessel owner-operators comply with OPA’s FAR provisions. The P&I clubs continue to insure vessels against pollution liability. The specialty insurers, however, pay claims not paid by the P&I clubs, such as claims denied because of the clubs exercise of policy defenses. In fact, P&I coverage is typically required in order to purchase OPA FAR coverage.

Guarantors must be certified by the U.S. government and face OPA auditing requirements. Some of the guarantors are mutual companies, in which liabilities are shared jointly and severally among members, with reinsurance coverage for large loss events (the P&I clubs are an example). In general, members do not have to reimburse the mutual company in the event of a spill (a “mutual call”) unless they are found to

Subcommittees on Coast Guard and Maritime Transportation and Water Resources and Environment, House of Representatives, March 24, 1999.

¹⁸⁵ Statement of Daniel Sheehan, Director, National Pollution Funds Center, USCG, 1996 House Hearing, note 156 *supra*.

¹⁸⁶ According to one company’s advertisements, small dry cargo vessel operators can get up to \$70 million in COFR coverage for \$1,000 a year. See www.american-club.com/cir2-98.htm (accessed July 28, 2000).

¹⁸⁷ 63 FR 42709, August 11, 1998.

¹⁸⁸ *Ibid*. In addition, the government estimates that each regulated firm bears \$4,000 in annual administrative costs associated with compliance.

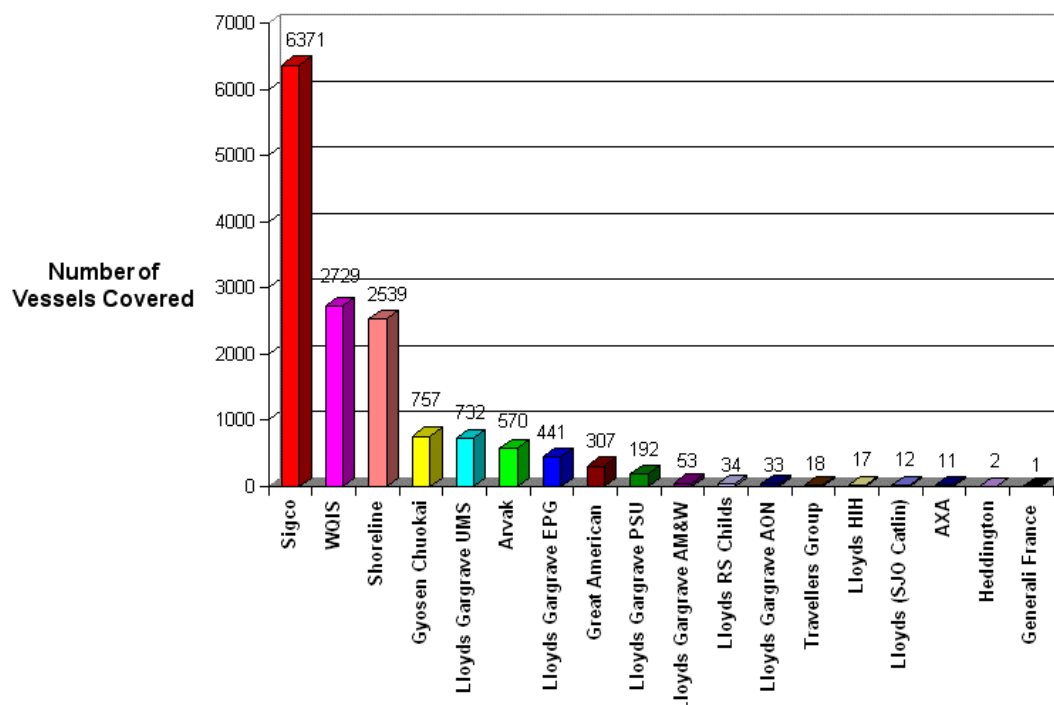
¹⁸⁹ These figures are DOI’s estimates for small facilities (those requiring only \$10 million in annual coverage). The total includes \$10,000 in estimated annual premium costs and \$4,000 annual administrative costs. 63 FR 42708, August 11, 1998.

have violated membership rules relating to safety, procedures, reporting, and other standards. Mutuals typically operate in such a way that profits are retained and shared among members. Other guarantors are premium-based insurers. As with the mutual companies, the insured does not have to reimburse the guarantor for costs paid on its behalf unless it is found to have violated the terms of the policy. Premiums for both types of company are largely determined by the reinsurance market and are a function of the vessel’s volume (the basis of the coverage requirement), age, and technical characteristics (such as single or double hull) and the cargo it carries.

As Figure 1 demonstrates, the market for OPA FAR guarantees involves a relatively large number of providers, particularly because the market is only six years old. Figure 1 relates to the provision of coverage by insurers alone. Insurers provide the vast majority of coverage under the allowable mechanisms. In addition, however, some firms self-insure or use the financial guaranty mechanisms described in Section 5.3. A very small number of vessels use surety bonds as evidence of coverage.

Figure 1

BREAKDOWN OF INSURERS PROVIDING EVIDENCE OF FINANCIAL RESPONSIBILITY FOR ALL VESSELS



Source: National Pollution Funds Center, USCG. Data as of September 2000.

Table 3 describes the FAR mechanism used as a function of vessel type. The total number of vessels covered by insurance (14,819) corresponds to the numbers presented in Figure 1. As the data suggest, OPA financial responsibility compliance is weighted heavily toward the use of insurance. Current indications are that this market will be relatively competitive and will—in concert with traditional P&I coverage—fulfill the cost recovery aims of the OPA and CERCLA financial assurance rules.

Table 3. Financial Responsibility Mechanism as a Function of Vessel Type

<i>Mechanism</i>	<i>Dry cargo</i>	<i>Tanker</i>	<i>Tank barge</i>	<i>MODU</i>	<i>Passenger</i>	<i>Fishing</i>	<i>Utility</i>	<i>Total</i>
Insurance	7,625	1,855	1,649	61	458	1,263	1,908	14,819
Financial guaranty	296	502	1,057	180	3	57	201	2,296
Self-insurance	44	18	1,273	64	61	0	304	1,764
Surety bond	0	22	48	0	0	3	13	86
Total	7,965	2,397	4,027	305	522	1,323	2,426	18,965

7.3 The Scale and Frequency of NRD Claims

As described in Section 3, the widespread application of NRD claims is relatively recent.¹⁹⁰ For this reason, and because there is no central repository of data on NRD claims, it is difficult to accurately summarize the range of NRD awards collected in the United States. By far the largest NRD case was the Exxon *Valdez* recovery. The *Valdez* case involved \$2.1 billion in cleanup costs, approximately \$1 billion in natural resource damages,¹⁹¹ and a \$5 billion punitive damage award.¹⁹² Although a particularly visible case, *Valdez* was unique in the scale of injury caused, damages awarded, and methodologies used, including extensive use of the CV methodology.¹⁹³

The government's pursuit of NRDs continues to evolve as it gains legal and economic experience with this kind of case. Meanwhile, several government and research studies provide at least a rough guide to the scale and likelihood of NRD claims. Two U.S. General Accounting Office (GAO) reports have addressed the scale of NRD claims under CERCLA. The first report found that as of April 1995, federal trustees had come to monetary NRD settlements in 50 cases¹⁹⁴ for a total of \$106 million, with recoveries ranging from \$4,000 to \$24 million.¹⁹⁵ As of that time, the five largest NRD settlements (not necessarily recoveries) ranged from \$12 million to \$24 million.¹⁹⁶ Another 50 cases had settled with no NRD-specific payments, usually because site remediation activities were judged to have sufficiently addressed natural

¹⁹⁰ The first NRD case filed under CERCLA (New Bedford) was in 1987. Also, see Duane Woodward and Michael Hope, "Natural Resource Damage under the Comprehensive Environmental Response, Compensation, and Liability Act, 14 *Harvard Environmental Law Review* 189, 1990 (citing lack of NRD cases as of 1990).

¹⁹¹ 4 Oil Spill U.S. Law Rep., November 1994, at 13–14.

¹⁹² The punitive damages have been appealed several times and have not been collected. In re *Exxon Valdez*, no. A89-095-CV (HRH) (D. Ct. Alaska, September 24, 1996).

¹⁹³ See Richard T. Carson et al., A Contingent Valuation Study of Lost Passive Use Values Resulting from the *Exxon Valdez* Oil Spill (Report to the Attorney General of Alaska), November 10, 1992.

¹⁹⁴ At that time there were 1,290 sites on the National Priorities List.

¹⁹⁵ U.S. General Accounting Office, *Outlook for and Experience with Natural Resource Damage Settlements*, GAO/RCED-96-71, April 1996, pp. 4–5.

¹⁹⁶ As of July 1995, only about 40% of the \$83.8 million had been collected.

resource damages. The numbers were updated in a second report later in the year.¹⁹⁷ As of July 1996, total NRD settlement amounts had increased to \$109 million from cases at 62 sites.¹⁹⁸

In terms of recoveries under OPA, as of March 1999, NOAA had collected \$45 million to repair natural resource damages associated with 20 oil spills.¹⁹⁹ Data suggest that NRD costs are a small fraction of total oil spill liability. According to one report, of the 5,000 to 10,000 oil spills annually in the U.S. coastal zone, fewer than 1% involve an NRD assessment.²⁰⁰ Of spills that result in NRD liability, NRD costs account for 26% of the total, which include response costs, third-party claims, and government penalties.²⁰¹

Also, a study of state-led NRD settlements in 1997 found that two states (Florida and Washington) had in excess of 100 settlements, three (California, New York, and Oregon) had reached between 11 and 20 settlements, 17 states had reached fewer than 10 settlements, and 13 states had no NRD settlements. The report found 33 cases settling for more than \$1 million.²⁰²

As another illustration, consider the experience with NRD claims collected over the past 10 years by the state of Michigan. NRDs have been collected at approximately 10 sites over that period, with recoveries ranging from \$200,000 to \$172 million (the next highest was \$3 million).²⁰³

The significance of NRD liabilities remains a subject of debate. In the eyes of NRD reform advocates (typically representing the regulated community), future NRD liabilities pose a huge potential cost.²⁰⁴ In

¹⁹⁷ U.S. General Accounting Office, *Superfund: Status of Selected Federal Natural Resource Damage Settlements*, GAO/RCED-97-10, November 1996.

¹⁹⁸ *Ibid.* As of July 1996, about 80% of the settlements had been collected.

¹⁹⁹ Testimony of David M. Kennedy, Office of Response and Restoration, NOAA, Subcommittees on Coast Guard and Maritime Transportation and Water Resources and Environment, House of Representatives, March 24, 1999.

²⁰⁰ This low percentage is likely a reflection of the significant costs associated with damage assessment and the pursuit of NRD claims. See U.S. General Accounting Office, *Outlook for and Experience with Natural Resource Damage Settlements*, GAO/RCED-96-71, April 1996, at 4. "Department of Justice officials state that the level of appropriations to fund federal natural resource damage programs is the single most important factor in determining how many sites can be assessed for damages."

²⁰¹ Douglas Helton and Tony Penn, Putting Response and Natural Resource Damage Costs in Perspective, mimeo, paper ID #114 1999 International Oil Spill Conference, <http://www.darp.noaa.gov/pdf/costsofs.pdf> (accessed July 17, 2000). The study looked at 48 oil spill incidents occurring between 1984 and 1997.

²⁰² Association of State and Territorial Solid Waste Management Officials, Survey of State Remedial Program Activities in Natural Resource Damages, February 1997. For an earlier state-level analysis, see Environmental Law Institute, *An Analysis of State Superfund Programs: 50-State Study, 1995 Update*, ELI Project 941724, p. 46.

²⁰³ Interview with Lynelle Marolf, Environmental Response Division, State of Michigan. The \$172 million liability settlement involved the Ludington Pump hydroelectric facility. A large component of the damages was calculated on the basis of lost recreational fishing due to fish kills attributable to the plant.

²⁰⁴ See statement of George Mannina, Director, Coalition for NRD Reform, Committee on Environment and Public Works, U.S. Senate, September 4, 1997. "When the NRD coalition formed two years ago, we were told NRD was a small problem involving only a few sites. A scant two years later, federal trustees state that they want to use their NRD authority at half the NPL sites and at 80,000 surface lagoons, 14% of all U.S. lake acreage and 4% of all U.S. river miles."

the eyes of government trustees, NRD claims represent a small and manageable fraction of the environmental costs generated by polluting vessels and facilities.²⁰⁵

7.4 Adverse Selection and Moral Hazard

Adverse selection is not a significant issue when financial assurance is mandatory. It describes a situation in which insurers cannot distinguish between low- and high-risk “types,” and low-risk types accordingly avoid the purchase of insurance that from their low-risk perspective is too highly priced. When insurance is mandatory, low-risk types remain in the market. Moreover, the significant information problems that are a prerequisite for adverse selection are, arguably, not present. For this reason, moral hazard is also not a significant problem.

In practice, several aspects of the liability and FAR rules lessen the likely impact of moral hazard. First, insurers can, and do, charge premiums as a function of the technologies being insured (e.g., the type of vessel construction) and claims history of the insured. Insurers can also cancel coverage as long as they give adequate advance notice. The possibility of cancellation can act as an important deterrent to lack of precaution by the insured. Coverage cancellation would force the insured to go back to the insurance market and purchase coverage from another firm, which would presumably be aware of the reasons for the original coverage cancellation. Failure to acquire coverage results in the closure or cessation of operations. Also, there are complementary regulatory and legal rules that discipline the actions of PRPs (e.g., the threat of criminal liability or imposition of safety standards). Finally, any truly egregious lack of precaution will void the liability limits in OPA and CERCLA, thus exposing the PRP to unlimited liability.

8. Financial Assurance in a Broader Context

Financial assurance is a component of several other U.S. regulatory programs authorized by several major statutes. RCRA, for instance, requires financial assurance for solid-waste (nonhazardous) landfills and hazardous waste treatment, storage, and disposal facilities.²⁰⁶ Facilities must provide financial guarantees designed to assure the internalization of costs associated with the closure of these facilities, their long-term maintenance, and liabilities associated with accidental environmental “occurrences.” RCRA also requires financial responsibility for the owners and operators of underground petroleum storage tanks, such as those used at gas stations.²⁰⁷ Operators of underground storage tanks (USTs) must demonstrate the ability to compensate third parties for property damage or injury arising from a leaking tank and

²⁰⁵ See testimony of Douglas Hall, NOAA, 1995 House Hearing, note 171*supra*. “With regards to the claim that NRD is a sleeping giant that is going to bankrupt industry, this is simply not the case. It amounts to nothing more than speculation that is unsupported by the record. We have had less than 5% of the sites on the national priorities list that have required compensation for natural resource injuries in addition to remediation. The compensation for natural resource damage at all NPL remedial sites has been less than 1% of the cost of remediation.”

²⁰⁶ RCRA’s Subtitles C and D govern hazardous and solid waste disposal facilities, respectively. The RCRA C financial responsibility rules are codified at 40 CFR 264 and 265 (“subpart H”). The RCRA D financial responsibility rules are codified at 40 CFR 258 (“subpart G”).

²⁰⁷ RCRA’s subtitle I covers UST facilities. The UST financial responsibility rules are codified at 40 CFR 280.

perform corrective action to restore a contaminated site. The amount of financial assurance that must be demonstrated can be significant. For example, even the smallest gas station operators must carry \$1 million in insurance coverage.

In addition, the Toxic Substances Control Act requires financial responsibility for the closure of facilities disposing of polychlorinated biphenyls (PCBs),²⁰⁸ financial assurance rules are applied to underground injection wells under the Safe Drinking Water Act,²⁰⁹ and U.S. mining laws require financial assurance for the reclamation of surface coal mining operations.²¹⁰

There are many similarities between those FARs and the OPA and CERCLA regulations highlighted in this paper. All allow compliance to be demonstrated via a variety of mechanisms, such as insurance, bonds, and self-insurance, and all have generated concerns regarding the insurability of the costs or risks they cover. The lesson to be learned from these programs is that financial products will emerge to satisfy the demands of legally mandated financial responsibility.

8.1 Coverage Rates

In the United States, there are active markets in insurance, surety bonds, and letters of credit geared toward compliance with financial responsibility rules. The costs associated with these products are difficult to summarize. However, a 1994 government study of environmental bond prices revealed a price of approximately 1–1.5% of the bond's face value. More specifically, the 1994 rates for noncollateralized bonds covering environmental obligations were as listed in Table 4.²¹¹

Table 4. Environmental Bond Rates

<i>Level or layer of coverage</i>	<i>Bond rate</i>
First \$100,000	\$25 per \$1,000 in coverage
Next \$100,000	\$15 per \$1,000 in coverage
Next \$2,000,000	\$10 per \$1,000 in coverage
Next \$2,500,000	\$7.50 per \$1,000 in coverage

The same report suggested that larger firms with good environmental records could obtain bonds at rates less than 1%.²¹² Similar rates are reported by other sources.²¹³

²⁰⁸ Codified at 40 CFR 761, Subpart D.

²⁰⁹ Codified at 40 CFR 144.28(d), 40 CFR 144.52(a)(7), and 40 CFR 144.60-144.70.

²¹⁰ 30 CFR 800.1-800.70.

²¹¹ Office of Solid Waste, U.S. EPA, Subtitle C and D Corporate Financial Test Issue Paper: *Performance of the Financial Test as a Predictor of Bankruptcy*, April 30, 1996, p. 5.

²¹² *Ibid.*, at 5.

²¹³ Interviews with Michigan Department of Environmental Quality financial assurance program administrators. Also see ICF Memorandum to Betsy Tam, EPA Office of Solid Waste, January 25, 1988 (cited in Office of Solid Waste, U.S. EPA, Subtitle C and D Corporate Financial Test Analysis Issue Paper: *Market Effects of the Financial*

8.2 Retroactivity and Availability of Affordable Coverage

In 1994, the U.S. GAO issued a report on the availability of environmental insurance products. A principal finding was that “the majority of companies operating treatment, storage, and disposal facilities in 1991 that attempted to obtain pollution insurance found that it was difficult to obtain”²¹⁴ and that 44% of surveyed firms attempting to obtain insurance between 1982 and 1991 were denied coverage at least once.²¹⁵ This conclusion is somewhat at odds with the conclusion that coverage is available and affordable. The discrepancy can be explained by subsequent improvements in the risks being insured (e.g., technological improvements) and by the insurance industry’s improved ability to predict exposures and tailor products to specific risks. In addition, the U.S. environmental insurance market in the 1980s and early 1990s was hobbled by the uncertainties generated by retroactive liability.

Retroactive liability, such as that allowed under CERCLA, was an attempt to assign legal responsibility for pollution costs that already existed. The combination of financial responsibility and retroactive liability is not advised.²¹⁶ As discussed in Section 2, financial responsibility is a policy tool geared toward deterrence and compensation; it is not an appropriate tool to foster the cleanup of preexisting environmental problems. In fact, the failure of regulation to account for the interaction between financial responsibility rules and retroactive liability largely accounts for the insurability problems associated with the environmental market in the United States in the past 15 years. A reason for unavailable or unaffordable coverage was that insurers were afraid of exposing their own assets to retroactive liability when underwriting future liabilities.

8.3 Overcoming the Problem of Retroactivity

For a variety of reasons, it is desirable to provide public financing for existing liabilities created by a change in legal rule, such as those created by CERCLA retroactivity. During the period of transition, public financing promotes the timely remediation of existing pollution and compliance with the prospective aims of the law.

The regulation of USTs in the United States has included public financing for preexisting liability and remediation costs via a system of state-run programs levying a tax on fuel purchases and fuel deliveries. The liabilities associated with USTs are large relative to the assets of many UST operators (such as small gas stations). RCRA mandates financial responsibility for UST owners. Unfortunately, when the rules were enacted, they did not distinguish between financial responsibility for future versus existing remediation. Because of a large number of already-leaking tanks, the immediate effect was to require insurance for known (certain) remedial costs. The financial impact was expected to be very significant,

Test, December 9, 1997, p. 2), which reports an annual 1.5% of face value cost of environmental letters of credit and surety bonds.

²¹⁴ See General Accounting Office, *Hazardous Waste: An Update on the Cost and Availability of Pollution Insurance*, GAO/PEMD-94-16, April 1994, p. 3.

²¹⁵ *Ibid.*, at 23.

²¹⁶ See James Boyd and Howard Kunreuther, *Retroactive Liability or the Public Purse?* 11 *Journal of Regulatory Economics* 79, 1997.

resulting in a tremendous amount of political opposition to the regulations.²¹⁷ Ultimately, EPA allowed states to establish publicly financed state guarantee funds to provide tank owners with the financial responsibility coverage required by RCRA.

Public financing of future pollution costs is highly undesirable, since it removes the owner-operator's incentive to take appropriate precaution. Accordingly, public financing should be in place for a limited period of time. Most states have already phased out the pooled, publicly financed funds or are in the process of doing so. Financial responsibility coverage is increasingly being provided by third-party private-sector insurers.

The result of the publicly financed remediation program, improved UST technologies, and greater underwriting experience has been a huge decrease in UST insurance premiums. The average annual premium for coverage of a new UST, purchased on the private market, was \$1,000 in 1989. In 1997, the average was \$400.²¹⁸

Currently, EPA lists 13 major insurers (e.g., Lloyds and Zurich-American) and 97 agents and brokers providing UST financial responsibility coverage.²¹⁹ The lesson to be drawn from the UST example is that public financing is a rational and workable response to retroactive liabilities. It also fosters the transition to a workable and affordable system of prospective financial responsibility provided by third-party private-sector providers. Although markets for financial assurance coverage may at first be problematic, over time they adapt to new environmental technologies and risks, resulting in greater availability and lower prices.

9. Voluntary Provision of Environmental Insurance

An important policy question is whether financial assurance for environmental liabilities should be made mandatory. One alternative, of course, is to rely on the voluntary provision of environmental coverages by private markets.

Clearly, if left to themselves, private markets will demand and supply environmental insurance coverage. We know this because we can observe such markets in active operation. For example, the P&I clubs provide pollution coverage, subject to some limitations, for the vast majority of the world's large ocean-going vessels. This was true long before the imposition of mandatory coverage requirements in the United States. As another example, a recent survey of major U.S. insurers revealed growing markets for

²¹⁷ Opposition was vociferous. Contributing to opposition was a front-page article in the *New York Times* (June 19, 1989, p. A1) with the headline "Fuel-Leak Rules May Hasten End of Mom and Pop Service Stations," which included an estimate by the American Petroleum Institute that the rules would force the closure of 25% of the nation's gas stations.

²¹⁸ Industrial Economics, Inc., *Improving Access-to-Capital, Site Transition, and Brownfield Redevelopment Programs through More Effective Environmental Risk Management*, February 1998.

²¹⁹ U.S. Environmental Protection Agency, *List of Known Insurance Providers for Underground Storage Tanks*, Office of Solid Waste and Emergency Response, EPA 510-B-00-004, January 2000.

environmental property transfer insurance, stop-loss insurance against cleanup costs overruns, and environmental contractor insurance.²²⁰ These markets are not a consequence of FARs.

The question is whether markets will voluntarily provide insurance coverage that is adequate from the standpoint of public policy. When purchased voluntarily, insurance benefits the purchaser by reducing risk, which is valuable in the presence of risk aversion. Note, however, that insurance is not purchased voluntarily to internalize costs. In fact, cost internalization is directly at odds with the profit motive. When a firm expects to externalize some fraction of large liability claims against it (the judgment-proof problem), the desire for insurance in response to risk aversion will be countered by the desire to avoid internalizing otherwise externalized costs.

Why does insurance imply greater cost internalization by an insured? In the United States, any insurer providing coverage to a potentially judgment-proof customer must build into the insurance cost its own exposure to the insured's liabilities. Insurers have been exposed to such costs under U.S. law. Demand for environmental insurance thus usually involves this trade-off: risk spreading versus greater cost internalization. When a firm's potential liabilities exceed its capital value, the disincentive to purchase insurance (greater cost internalization) is likely to outweigh the benefits of insurance (reduced uncertainty).

Of course, one solution to the above problem is to strictly limit the insurer's liability to amounts established in the insurance contract. This is an efficient legal rule from the standpoint of contract and insurance economics. In voluntary insurance markets, though, strict enforcement of limited insurance contracts will do nothing to increase the degree of cost internalization provided by the potential polluter. Contracts will simply limit coverage to a firm's exposure in the absence of mandatory coverage requirements. It is irrational for both the insured and the insurer to create any greater legal exposure to environmental claims.

Experience in the United States shows that NRD liabilities can be large, ranging into the hundreds of millions of dollars. Moreover, NRD injuries can be caused not only by large multinational firms capable of cost internalization but also by relatively small commercial operations whose assets may be dwarfed by liabilities arising from a single incident. Under these conditions, voluntary insurance provision that yields greater cost internalization is highly unlikely.²²¹

Although no comprehensive empirical survey exists, environmental bankruptcies in the United States have been common over the past few decades. In fact, environmental bankruptcies were arguably the primary motivation for the broad set of mandatory financial assurance regulations established in the United States over the past 20 years. One illustrative anecdote is that of 62 NRD settlements reviewed by the U.S. GAO in 1996, six involved firms in bankruptcy proceedings.²²² In part, U.S. environmental

²²⁰ U.S. Environmental Protection Agency, *Potential Insurance Products for Brownfields Cleanup and Redevelopment*, EPA 500-F-97-106, April 1997.

²²¹ Moral hazard, adverse selection, and risk estimation bias act as further barriers to an effective voluntary insurance market. For some risks, moral hazard and adverse selection can be addressed by experience rating, monitoring, deductibles, and policy defenses. Moral hazard and adverse selection cannot be eliminated, however.

²²² See GAO, note 196 *supra*.

bankruptcies were due to changes in U.S. law that led to the imposition of large retroactive liabilities on firms that had done relatively little to reduce environmental risks in the decades preceding legal reform. Such bankruptcies were also due to the scale of environmental risks relative to polluters' ability to pay for damages. As a result, financial responsibility is the most effective (if not the only) policy mechanism capable of ensuring that environmental costs will be internalized.

Comparison of the scale of NRD awards with even optimistic estimates of the financial assets available to compensate losses suggests that cost externalization is a significant possibility for a very wide range of industrial and commercial operations. Risk aversion may create some demand for insurance, but it is unlikely to be sufficient motivation for greater voluntary exposure to liability.

Finally, political opposition to mandatory financial responsibility confirms that insurance is unlikely to be provided voluntarily. Although some opposition arises from the arguable imperfections in the mandatory mechanisms themselves (e.g., the P&I clubs' opposition to the lack of policy defenses), many of the complaints are due simply to the obvious costs of compliance.²²³ These costs, of course, are exactly what will inhibit the spontaneous development of a voluntary, adequate cost-internalizing environmental insurance market.

10. Conclusion

Over the past decade, various financial responsibility rules have been implemented to complement the liability and regulatory objectives of U.S. environmental policy. New rules always imply new costs, responsibilities, and challenges. Environmental FARs are no different. The overall picture, however, is of a set of programs that have been implemented with success. By and large, private-sector coverage mechanisms are available at rates that can be absorbed by most of the firms to which the requirements apply. Moreover, the trends in coverage availability and premium affordability are positive.

Coverage of natural resource damages will continue to be a source of discomfort for underwriters and other guarantors. The estimation of damages remains subject to large legal, scientific, and economic uncertainties. Nevertheless, as a component of environmental liabilities generally, NRDs remain a relatively contained fraction of costs. The predicted explosion in NRD claims has simply not come to pass. There is also reason to believe that financial assurance is fostering the use of environmentally safer technologies, improving PRP environmental management, and helping the government recover costs from responsible parties.

²²³ A focus of lobbying efforts in the United States is for the relaxation of the conditions under which firms can self-insure (i.e., not have to purchase insurance from third parties). It is clearly in a firm's economic self-interest to qualify. According to one committee reviewing such proposals, "additional mechanisms for qualifying as a self-insurer are needed to ensure that the costs of demonstrating OSFR do not cause serious economic harm to responsible parties." Minerals Management Service, OCS Policy Committee Passes Recommendations on Oil Pollution Act Financial Responsibility Requirements (#50033), May 4, 1995 (<http://www.mms.gov/ooc/press/1995/50035.txt>). The public policy implications of relaxed qualifying conditions are negative, since relaxed conditions thwart cost internalization. The unsurprising message to be taken from such a statement, however, is that greater cost internalization is costly. It is something firms wish to avoid, rather than something they will pursue voluntarily.