Allocation of Liability Under CERCLA: A “Carrot and Stick” Formula

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INTRODUCTION

The Environmental Protection Agency (EPA), operating under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), has failed to make any appreciable progress toward cleaning up the nation’s hazardous waste sites. Only ten sites were fully cleaned up in the first five years of the program. If the more than 10,000 hazardous waste sites nationwide are to be cleaned up in a timely manner, the private sector will have to initiate voluntary cleanups.

One of the major impediments to voluntary cleanups is the problem of allocating liability among the numerous parties responsible for the cleanup costs of a particular site. CERCLA originally provided very little guidance as to how the liability created by the statute ought to be allocated. EPA attempted to fill that void with a litigation strategy premised on joint and several liability combined with a voluntary settlement.

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1. 42 U.S.C.A. §§ 9601-9675 (West 1983 & Supp. 1987). CERCLA creates a comprehensive scheme of administrative and judicial alternatives for addressing the problems presented by the disposal of hazardous waste. The entire statute is often called Superfund. The Superfund, however, is only that portion of CERCLA which provides for direct cleanup of hazardous waste sites by the federal government. Id. § 9631.

2. General Accounting Office, Cleaning Up Hazardous Wastes: An Overview of Superfund Reauthorization Issues 28 (Mar. 29, 1985). “Cleaned up” in this sense refers to completed actions, which prevent sites from continuing to threaten the environment. Under CERCLA there is a distinct difference between long-term cleanups and short-term cleanups. See infra notes 30-31. Unless otherwise noted, use of the term “cleanups” in this article refers to long-term cleanups.


5. See infra notes 164-65 and accompanying text.
policy. Although the courts uniformly have upheld EPA's contention that joint and several liability is available under CERCLA, few courts actually have imposed such liability in a CERCLA case.

The limited number of cleanups completed during the first five years of CERCLA demonstrates the ineffectiveness of EPA's program and the need for a radically different approach. Congress sought to bolster the effectiveness of the cleanup program by expressly authorizing CERCLA settlements under the Superfund Amendments and Reauthorization Act of 1986 (SARA). Although otherwise quite comprehensive and detailed, the new settlement section fails to provide the most essential element of an effective settlement program—sufficient incentives for private parties to initiate voluntary cleanups.

This Article proposes a liability allocation formula designed to encourage voluntary cleanup of hazardous waste sites by private parties. The formula combines the traditional concepts of joint and several liability, contribution, and release from future liability in a two-step process that provides incentives for voluntary action.

Section I of this Article describes the nature and magnitude of the problems presented by hazardous waste sites, discusses the sections of CERCLA most relevant to the allocation of liability, and analyzes the effectiveness of those provisions as they have been interpreted by the courts and applied by EPA. Section II analyzes traditional and evolving tort law principles and applies those principles to the problem of allocating liability under CERCLA. Finally, Section III combines the concepts of joint and several liability, release from future liability, and contribu-

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6. Mays, supra note 3, at 7, 10-11. See generally Anderson, Negotiation and Informal Agency Action: The Case of Superfund, 1985 Duke L.J. 261, 287-307. (The report on which Anderson's article was based was prepared for the consideration of the Administrative Conference of the United States. It represents only the views of its author, and not necessarily those of the conference.)

7. The seminal case on joint and several liability under CERCLA is United States v. Chem-Dyne Corp., 572 F. Supp. 802 (S.D. Ohio 1983). In Chem-Dyne, the court concluded that the question of whether CERCLA liability is joint and several shall be answered on a case-by-case basis under common law principles. Id. at 810.

Though no appellate courts have imposed joint and several liability under CERCLA, several district courts have followed Chem-Dyne either in holding that joint and several liability is possible under CERCLA or, in a few cases, in actually holding the defendants jointly and severally liable. See, e.g., United States v. Stringfellow, 661 F. Supp. 1053, 1060 (C.D. Cal. 1987) (the court concluded that the case was an appropriate one for imposing joint and several liability in part because it was impossible to determine how much each defendant contributed to the release of waste); United States v. A & F Materials Co., 578 F. Supp. 1249, 1256-57 (S.D. Ill. 1984) (the court concluded that joint and several liability is not precluded under CERCLA).


9. See infra notes 54-60 and accompanying text.
tion in an innovative manner to produce a liability allocation formula designed to promote voluntary cleanups of hazardous waste sites.

I


A. The Problem

Our society relies to a large extent on chemical technology. Manufacturers in the United States produced 365 billion pounds of chemical substances in 1979; at that time the rate of production was increasing 7.6% annually. The federal government has estimated that approximately 60% of these substances are hazardous. The consumer products made from these chemicals contribute immensely to the quality of life in the United States. On the other hand, the 266 million metric tons of hazardous waste generated annually during the production of those consumer goods is responsible for one of the most serious environmental problems of this generation.

Since the enactment of CERCLA, EPA has been compiling an inventory of hazardous waste disposal sites that may require some type of cleanup. As of October 31, 1984, EPA had identified 19,187 potentially hazardous sites and had estimated that the number could eventually reach 22,000.

The number of sites that eventually may require cleanup is only one of the problems presented by hazardous waste contamination. The quantity, mobility, and toxicity of the chemical wastes disposed of at the sites, the geologic makeup of the surrounding soil and strata, and the proximity and purity of the groundwater are all elements that directly affect the manner, timing, and cost of cleanup.

Cleanups are also affected by the staggering array of wastes and methods of disposal. Acids and bases, synthetic organic compounds, toxic metals, infectious organic materials, fuel byproducts, radioactive materials, and explosives are just a few of the substances of concern. They have been stored in fifty-five-gallon metal drums, in wood and paper packaging, or in other containers. These containers have been

11. Id.
Poor disposal methods present a variety of problems. Where uncontained wastes are dumped on the ground or in trenches, immediate contamination of the soil occurs. Even contained wastes eventually may make their way into the soil, water, and air as the containers decompose and are breached. Two complications emerge as these wastes intermix. First, the wastes become more difficult to "fingerprint" accurately. Second, they may create new and potentially more dangerous "hybrid" wastes.

One important measure of the severity of conditions found at leaking hazardous waste sites is the cost of remedying those conditions. For example, cleanup costs are averaging $6.5 million per site where groundwater problems do not exist and $10 million per site where groundwater has been contaminated. Estimates of the total bill for cleaning up all the hazardous waste disposal sites that eventually may require cleanup have ranged from $8 billion to $100 billion. By all estimates, rectifying forty years of improper disposal of hazardous chemical waste will be extraordinarily expensive.

B. The Response

CERCLA was enacted to address the complex problems presented by the previously unregulated disposal of hazardous waste. Congressional sponsors of the Act generally envisioned that it would fulfill two goals. First, the Act would promote the use of maximum care by the handlers of hazardous waste. Second, it would provide a mechanism for rapid response to the release of hazardous substances, including an immediately available source of funding for cleanup and mitigation actions.

17. "Fingerprinting" refers to the process of tracing a particular substance back to its source. In the process, parties associated with that substance can be identified.
20. S. REP. No. 848, supra note 10, at 12. The sponsors of the original bill also had a third goal—compensation of victims of exposure to hazardous waste. The victim compensation provisions of the bill, however, were deleted from the legislation in order to ensure passage of the cleanup provision in the Senate. See Grad, A Legislative History of the Comprehensive
To achieve its goals, CERCLA attacks the hazardous waste problem from four angles. First, the Act places financial liability for the release of hazardous substances on the parties responsible for those releases. Second, it establishes a public fund (the Superfund) to finance hazardous substance cleanups when a financially responsible party cannot be located. Third, the Act requires members of the chemical industry to contribute to the Superfund. Finally, CERCLA grants the federal government broad authority to respond to the release of hazardous substances into the environment. In short, CERCLA constitutes a mechanism through which Congress has allocated to a certain segment of society ultimate responsibility for remedying the problems associated with our dependence upon chemical technology.

Sections 101, 104, 106, 107, 113, and 122 of CERCLA are particularly relevant to the allocation of liability created by the Act. Section 101 defines numerous terms used throughout CERCLA. The genesis of the far-reaching scope of CERCLA can be found in the broad definitions of facility, hazardous substance, pollutant or contaminant, owner or operator, person, contractual relationship, release, removal, remedial action, and liability.


23. CERCLA § 101(9), 42 U.S.C.A. § 9601(9). Facility means:
   (A) any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft, or (B) any site or area where a hazardous substance has been deposited, stored, disposed of, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel.
24. Id. § 101(14), 42 U.S.C.A. § 9601(14).
25. Id. § 101(33), 42 U.S.C.A. § 9601(33).
26. Id. § 101(20), 42 U.S.C.A. § 9601(20). This definition has been further refined with respect to land ownership by the definition of “contractual relationship” added to CERCLA by SARA § 101(f), 42 U.S.C.A. § 9601(35) (West Supp. 1987).
27. CERCLA § 101(21), 42 U.S.C.A. § 9601(21). Person means “an individual, firm, corporation, association, partnership, consortium, joint venture, commercial entity, United States Government, State, municipality, commission, political subdivision of a State, or any interstate body.” Id.
29. Id. § 101(22), 42 U.S.C.A. § 9601(22). Release is defined as any “spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment . . . .” Id.
30. Id. § 101(23), 42 U.S.C.A. § 9601(23). “Remove” and “removal” encompass any and all actions of an interim nature which may be necessary to respond to a release of a hazardous substance. See id.
31. Id. § 101(24), 42 U.S.C.A. § 9601(24). Remedy and remedial refer to those actions that are consistent with a permanent solution to the release and that are taken instead of or in addition to removal actions. See id.
32. Id. § 101(32), 42 U.S.C.A. § 9601(32). This subsection refers to section 311 of the
Section 104 authorizes the federal government to respond to the release of hazardous substances. Whenever there has been a release or a substantial threat of a release into the environment of a hazardous substance, the President—or EPA, through authority delegated by the President—is empowered to expend Superfund monies to finance a removal or remedial action. Response actions taken pursuant to section 104 must be consistent with the National Contingency Plan and, to the extent practicable, should contribute to the efficiency of any long-term remedial action. Each response action is limited to the expenditure of $2 million over a one-year period unless at least one of three conditions is met: (1) EPA determines that continued response action is required to prevent an emergency, (2) the state in which the release occurs has entered into a contract or cooperative agreement with the federal government, or (3) continued response action is otherwise appropriate and necessary.


CERCLA also applies to the release of a pollutant or contaminant that may present an imminent and substantial danger to the public health or welfare. Id. § 104(a), 42 U.S.C.A. § 9604(a).

Id. This section has been amended to provide that the President may “allow” a potentially responsible party to carry out the response action when the President determines that such action will be done “properly and promptly” by the party. Id. The President has delegated his authority under section 104 to the Environmental Protection Agency. Exec. Order No. 12,316, 3 C.F.R. 168 (1982), reprinted in 42 U.S.C.A. § 9604(a).

CERCLA § 104(a)(1), 42 U.S.C.A. § 9604(a)(1). The National Contingency Plan is a significantly expanded carryover from the Clean Water Act. It provides the criteria to be used in establishing cleanup priorities among thousands of waste sites and specifies methods for inventorying facilities that contain hazardous substances. The guts of the plan under CERCLA is the National Priorities List (NPL)—a list of approximately 700 sites which have first call on the Superfund. The National Priorities List, 40 C.F.R. pt. 300 app. B (1985), is published separately from the National Contingency Plan. See CERCLA § 105(b)(8), 42 U.S.C.A. § 9605(b)(8).

CERCLA § 104(b), 42 U.S.C.A. § 9604(b).

Id. § 104(c)(1), 42 U.S.C.A. § 9604(c)(1).

Id. An emergency exists if the President finds that: “(i) continued response actions are immediately required to prevent, limit, or mitigate an emergency, (ii) there is an immediate risk to public health or welfare in the environment, and (iii) such assistance will not otherwise be provided on a timely basis.” Id.

Id. § 104(c)(3), 42 U.S.C.A. § 9604(c)(3). The state is also required to assure the President that it has the ability to maintain the response actions for the life expectancy of those actions, that an offsite storage facility is available, and that the state will pay at least 10% of the cost of remedial actions including all future maintenance. If the state or a political subdivision owns the waste site, the state must agree to pay at least 50% of the remedial action costs. See id. SARA added the requirement that states must establish at least one hazardous waste disposal site that meets the criteria of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901-6991 (1982 & Supp. III 1985). This requirement forces the states to estab-
consistent with any remedial action being taken.\textsuperscript{41}

Under section 106, the federal government may direct private parties to perform necessary response actions.\textsuperscript{42} When the release or threatened release of a hazardous substance poses an imminent danger to public health and welfare, EPA may require the Attorney General to initiate an action in federal district court to secure whatever relief may be necessary to abate the danger. EPA may also issue administrative orders directing private parties to take whatever action is necessary to protect the public and the environment.\textsuperscript{43}

EPA has substantial authority under section 106 to force private party action. Specifically, the recipient of an administrative order is not entitled to preenforcement judicial review of the order.\textsuperscript{44} The recipient may either refuse to comply with the order—and run the risk of treble damages\textsuperscript{45} and fines of up to $25,000 per day\textsuperscript{46}—or perform the required action and then petition the government for the reasonable costs of such action. To obtain reimbursement, the petitioner must prove by a preponderance of the evidence that he is not liable for response costs under section 107.\textsuperscript{47}

Section 107 creates liability for the cost of cleanups and assigns that liability to a broadly defined class of persons.\textsuperscript{48} That class, known as potentially responsible parties (PRP's), consists of anyone who is or has been associated with a site from which a release has occurred.\textsuperscript{49} Any person in that class is strictly liable for all costs of cleanup,\textsuperscript{50} subject only

\textsuperscript{41} CERCLA § 104(c)(1), 42 U.S.C.A. § 9604(k) (West Supp. 1987).

\textsuperscript{42} Id. § 106, 42 U.S.C.A. § 9606.

\textsuperscript{43} Id. § 106(a), 42 U.S.C.A. § 9606(a).


\textsuperscript{45} CERCLA § 107(c)(3), 42 U.S.C.A. § 9607(c)(3).

\textsuperscript{46} Id. § 106(b), 42 U.S.C.A. § 9606(b).

\textsuperscript{47} Id.

\textsuperscript{48} Id. § 107(a), 42 U.S.C.A. § 9607(a).

\textsuperscript{49} Id. Persons who have been associated with the site include present owners and operators of the site, past owners and operators of the site at the time hazardous wastes were disposed there, any waste generator or other person who arranged for the treatment or disposal of those wastes, any person who arranged for the transport to the site of wastes that they owned or possessed, and any transporter of waste who selected the site for disposal or treatment of those wastes. Id.

\textsuperscript{50} Id. § 107(a)(4)(A), (D), 42 U.S.C.A. § 9607(a)(4)(A), (D). Costs of cleanup include: (A) all costs of removal or remedial action incurred by the United States Government or a State not inconsistent with the national contingency plan; (B) any other necessary costs of response incurred by any other person consistent with the national
to the limited defenses provided in section 107(b).\(^5\)

In 1986, SARA added section 113(b), which establishes an express right of contribution under CERCLA.\(^5\) Under this provision, any person who is or may be liable under section 107 is subject to a contribution action unless that person has resolved her liability to the government in an approved settlement. Contribution actions are governed by federal law, and the courts are expressly authorized to allocate cleanup costs among liable parties using whatever equitable factors they deem appropriate.\(^5\)

Section 122(a) of SARA authorizes the President to enter into settlement agreements with PRP's for payment of response costs or for performance of response actions.\(^5\) The section establishes procedures for using consent decrees in settlement agreements,\(^5\) ensures opportunity for public comment,\(^5\) and imposes a moratorium on enforcement and response actions during negotiation of such agreements.\(^5\) In order to expedite settlements, the President is empowered to make a "non-binding preliminary allocation of responsibility" among PRP's for the total response costs.\(^5\) In addition, the settlement authority under section 122 carries with it the discretion to use "mixed funding" for cleanups\(^5\) and the authority to issue covenants not to sue.\(^6\) The President's decision whether to use the settlement authority is discretionary and not subject

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\(^{51}\) Id. § 107(b), 42 U.S.C. § 9607(b) (1982). The defenses encompass only acts of God, acts of war, and acts of unconnected third parties. The latter defense is available only if the PRP can show that he exercised due care and took reasonable precautions against foreseeable acts of those third parties. Id.


\(^{53}\) Id.

\(^{54}\) Id. § 122(a), 42 U.S.C.A. § 9622. Section 122(a) appears to contemplate three different types of settlement agreements: (1) agreements for private parties to perform response actions, (2) agreements for either private party response action or cost recovery where the party's contribution of waste to the site is de minimis, and (3) agreements to settle section 107 cost recovery actions. Id. § 122(a), 42 U.S.C.A. § 9622(a), (b), (g).

\(^{55}\) Id. § 122(a), 42 U.S.C.A. § 9622(d)(1)(A).

\(^{56}\) Id. § 122(a), 42 U.S.C.A. § 9622(d)(2)(B).

\(^{57}\) Id. § 122(a), 42 U.S.C.A. § 9622(e)(2)(A).

\(^{58}\) Id. § 122(a), 42 U.S.C.A. § 9622(e)(3).

\(^{59}\) Mixed funding involves paying a portion of the response costs with Superfund monies. See id. § 122(a), 42 U.S.C.A. § 9622(b).

\(^{60}\) See id. § 122(a), 42 U.S.C.A. § 9622(f). The authority to issue covenants not to sue for future liability is discretionary, except in two situations: (1) when the government has required a response action involving the physical removal of wastes from the site and has rejected a proposed response action that was consistent with the National Contingency Plan, or (2) when the response action involves the treatment or destruction of the wastes so as to eliminate any current or currently foreseeable risk to public health and the environment. In both of these situations, the government is required to provide a release from future liability. See id.
C. The Result

The result of the first five years of Superfund activity was disappointing. The federal government spent $1.6 billion, but only ten sites were cleaned up completely. The primary reason for this poor performance is the lack of negotiated voluntary cleanups. Negotiated response actions are needed because the complexity of toxic waste litigation makes it both time consuming and expensive. Negotiated settlements significantly reduce the time and transaction costs associated with cleanups. CERCLA can best accomplish its mission—to clean up the largest number of sites in the shortest time and at the lowest cost—by encouraging negotiated settlements.

EPA’s policy has failed to encourage negotiated settlements because its negotiations have been exclusively power based, offering no incentives to settle. Buttressed by judicial decisions consistently upholding EPA’s position, the agency in effect has issued an ultimatum of “settle on the government’s terms or litigate and lose.”

Although EPA’s position is strong, it is not unassailable. On questions of law, no court has given EPA exactly what it wants—the authority to assign a very limited number of deep pocket PRP’s responsibility for the entire cleanup and then get out of the suit, leaving those PRP’s to whatever contribution remedies may exist. Moreover, although the courts have begun to apply joint and several liability, many ancillary is-

61. Id. § 122(a), 42 U.S.C.A. § 9622(c), (f).
62. GENERAL ACCOUNTING OFFICE, supra note 2, at 28.
63. For a general discussion of the impact that negotiated voluntary cleanups may have on Superfund’s efficacy, see Mays, supra note 3; Rikleen, supra note 3.
64. Litigation occurs whenever EPA seeks to enforce a cleanup order issued under section 106 or when EPA or another party seeks reimbursement of response costs under section 107.
66. For an excellent analysis of the benefits and mechanics of the negotiation process as applied to cleanups of hazardous waste sites under CERCLA, see Anderson, supra note 6, at 319-42.
67. See id. at 320-22.
68. Section 107 merely declares that all PRP’s are responsible for all costs of cleanup. EPA has asserted successfully in a series of federal district court actions that section 107 makes a PRP subject to joint and several liability. See, e.g., United States v. Chem-Dyne Corp., 572 F. Supp. 802 (S.D. Ohio 1983); United States v. Outboard Marine Corp., 556 F. Supp. 54 (N.D. Ill. 1982); United States v. Reilly Tar & Chem. Corp., 546 F. Supp. 1100 (D. Minn. 1982); United States v. Price, 523 F. Supp. 1055 (D.N.J. 1981), aff’d, 688 F.2d 204 (3d Cir. 1982). The district courts have reserved the right, however, to direct EPA to apportion the response costs in cases in which a PRP’s individual contribution can be ascertained. See F. Anderson, supra note 65, at 14, 18-19.
sues remain unresolved. Finally, the complexity of cleanups presents defendants with ample grounds for believing that a favorable result might be achieved through litigation. Faced with these uncertainties, many PRP's will risk the costs of going to court.

EPA's early settlement policy generated strong and deserved criticism and recommendations for change. In response, EPA modified its policy, chiefly with respect to the threshold of acceptable settlement offers. The new policy, however, does not provide a method for allocating liability among PRP's. Whether the partial modification of the settlement policy resulted in more negotiated cleanups is uncertain because CERCLA's enforcement program was slowed significantly by congressional delay in passing SARA. Irrespective of any improvement brought about by EPA's policy change, private party involvement in cleaning up hazardous waste sites still needs to be encouraged.

In recognition of this need, Congress added section 122(a) of SARA to CERCLA. Three provisions in section 122(a) could lead to more negotiated settlement agreements. First, the section authorizes the President to prepare nonbinding preliminary allocations of responsibility. Second, it permits the use of "mixed" private and Superfund financing of cleanups. Finally, it empowers the President to grant releases from future liability. Unfortunately, all three provisions are so weak or limited that, in practice, they may provide no incentive for settlement. For example, the President is not required to prepare a preliminary allocation of responsibility, and if one is prepared, CERCLA does not provide an

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69. For example, the courts have not indicated the threshold number of defendants or percentage of waste contributed to the site necessary before joint and several liability will be available. Likewise, courts generally have not determined how liability will be allocated in a contribution action. F. Anderson, supra note 65, at 8-20.

70. See Anderson, supra note 6, at 270-314. See also Superfund: How to Rebuild a Badly Damaged Program, ENVTL. F., June 1983, at 17 (panel discussion of some of the major criticisms).

71. Threshold in this sense refers to the amount of the initial settlement offer from the PRP's relative to the total cost of cleanup. Unless the offer equaled or exceeded this threshold, EPA would not negotiate. The threshold requirement has been changed from a guideline of 80% to a "substantial proportion of the costs of cleanup at the site, or a substantial proportion of the needed remedial action." See Mays, supra note 3, at 8.

72. Id. at 7. EPA's failure to modify its position on the issue of allocating liability is sharply criticized in Moorman, supra note 4, at 11-12.

73. Futrell, Foreword to ENVIRONMENTAL LAW REPORTER, SUPERFUND DESKBOOK at v (1986).


75. SARA § 122(a), 42 U.S.C.A. § 9622(e)(3).

76. Id. § 122(a), 42 U.S.C.A. § 9622(b).

77. Id. § 122(a), 42 U.S.C.A. § 9622(f).
explicit formula upon which to base the allocation.\textsuperscript{78}

In addition, although section 122(a) allows unlimited use of the Superfund in a mixed funding agreement, it restricts the fund's availability for future remedial actions at the same site. The fund can be used only for additional response costs resulting from the failure of the original remedial action, and then only in proportion to the fund's contribution to the original action.\textsuperscript{79} This limitation on future liability has two effects: it strongly discourages relying on the Superfund to any significant degree for the original remedial action, and it undermines the government's willingness to release private parties from future liability.\textsuperscript{80}

Finally, the discretionary authority to provide covenants not to sue for future liability is so limited that the authority is effectively emasculated. Under section 122(a), a covenant not to sue can be granted only if: (1) the covenant is in the public interest; (2) the covenant will expedite the response action; (3) the recipient of the covenant is in compliance with a consent decree; and (4) the response action has been approved by the President.\textsuperscript{81} If applied appropriately, these requirements should not discourage EPA from providing covenants not to sue. A covenant not to sue, however, cannot release a settling party from liability for costs stemming from conditions at the site that were unknown at the time of the original remedial action.\textsuperscript{82} When combined with the limitations on the use of the Superfund for future remedial actions, this restriction makes it likely that EPA rarely will grant releases from future liability.

In short, section 122 fails to provide the element most necessary to encourage settlement agreements—a liability allocation formula that provides incentives for private party cleanups. Without such a formula, it is unlikely that the number of sites cleaned up in the next five years will be proportionately any greater than the number cleaned up during the last five.\textsuperscript{83}

CERCLA's current scheme for allocating liability greatly influences the willingness of PRP's to enter into settlement agreements.\textsuperscript{84} The

\textsuperscript{78} The President's authority to prepare a preliminary allocation of responsibility is entirely discretionary. \textit{Id.} § 122(a), 42 U.S.C.A. § 9622(e)(3).
\textsuperscript{79} \textit{Id.} § 122(a), 42 U.S.C.A. § 9622(b)(4).
\textsuperscript{80} In so far as the future obligation of the Superfund is expressly limited to its proportional share of the costs of the original response action, there would be no source of funding to finance the portion of any future response action not covered by the Superfund. It is highly unlikely, therefore, that EPA will issue any releases from future liability under its discretionary authority.
\textsuperscript{81} \textit{SARA} § 122(a), 42 U.S.C.A. § 9622(f)(1).
\textsuperscript{82} \textit{Id.} § 122(a), 42 U.S.C.A. § 9622(f)(6).
\textsuperscript{83} In the number of sites cleaned up, significantly more progress should be made because Congress has increased the size of the Superfund five-fold to $8.5 billion dollars. \textit{See CERCLA} § 111(a), 42 U.S.C.A. § 9611(a) (West Supp. 1987).
\textsuperscript{84} For additional factors that influence the willingness of PRP's to negotiate and settle, see Moorman, \textit{supra} note 4.
courts have held that, to trigger CERCLA liability, a party need only fall into one of the four classes of responsible parties identified in section 107. As a result, the class of PRP’s at any particular waste site can be astonishingly varied. The class can range from Fortune 500 firms (typically waste generators), to now-bankrupt “mom and pop” companies (usually transporters or owner/operators). The class may consist of one generator who disposed of only a few pounds of one substance and another generator who consigned several million pounds of a different substance. Further, one generator’s waste may have been disposed of in a safe manner, whereas another’s waste may have been dumped by an unscrupulous transporter on the surface of the ground without any containment whatsoever. Given the diversity of PRP’s, a workable formula for liability allocation is an essential ingredient for promoting settlement.

A liability allocation scheme can encourage settlement in two ways. First, it provides a basis for predictable results. An allocation scheme serves as a standard by which future litigants can prejudge the extent of their liability. This encourages settlement by reducing the uncertainty in which litigation thrives. In this sense, allocation schemes establish norms that define the context of the negotiations.

Second, allocation formulas can encourage settlement by providing positive incentives to negotiate. A scheme designed to allocate responsibility in a manner perceived by PRP’s as relatively fair and equitable induces them to accept voluntarily their share of responsibility for the cleanup because they prefer that result to the uncertainties of litigation.

D. Summary

It is time for Congress to revisit the issue of allocating liability under CERCLA and to establish an allocation formula that explicitly defines how financial responsibility for response actions will be divided among PRP’s. The experience of the first five years of CERCLA has demonstrated that EPA and the courts are incapable of applying traditional common law tort concepts to Superfund cases in a way that promotes settlement. Although section 122(a) of SARA expressly authorizes settlements, it does not provide a specific formula for allocating liability. Section 122(a) may even hinder settlement negotiations because it severely restricts the ability of EPA and the courts to use common law tort concepts of settlement and release in an innovative manner. Congress must devise its own specific allocation scheme. In so doing, Congress

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86. See Anderson, supra note 6, at 320-22; see generally Eisenberg, Private Ordering Through Negotiation: Dispute-Settlement and Rulemaking, 87 Harv. L. Rev. 637 (1976) (arguing that negotiated settlements that become known to similarly situated third parties can augment the norms governing the actions of those parties).
should draw upon traditional and evolving concepts of liability allocation and combine their best attributes in a manner that is responsive to the needs and objectives of CERCLA.

II
CONCEPTS, RULES, AND THEORIES OF LIABILITY ALLOCATION

This Section identifies and analyzes the various theories that have been developed for allocating liability among multiple defendants. The analysis juxtaposes the policies advanced by traditional rules and theories with the problems inherent in cleaning up hazardous waste sites. This discussion provides the foundation for a liability allocation formula that responds to the monumental problems CERCLA is designed to address.

The traditional rule in all multiple defendant cases was that a person is responsible only for the damages proximately caused by his own acts or omissions and that the plaintiff bears the burden of proving damages. Rigid adherence to the traditional apportionment rule in cases with little or no basis for proving a division of damages led either to court-sanctioned apportionment on arbitrary terms or to no recovery whatsoever.

Over the last twenty-five years, the courts increasingly have carved out significant exceptions to the traditional apportionment rule. Indeed, CERCLA is best viewed as a recent example of a progressive legislative and judicial expansion of the scope of liability in the field of torts. One consequence of that expansion is that Congress and the courts have developed several new formulas for determining when and how the ultimate responsibility for a plaintiff’s losses are distributed among the defendants.

A. Joint and Several Liability and Liability for Entire Damages

Traditionally, “joint and several liability” and “entire liability” were distinct concepts. Joint and several liability arose when two or more defendants acted together in a joint enterprise to cause the plaintiff’s injury or when the defendants owed a common duty to the plaintiff. Because of the concert of action or mutual responsibility, each defendant was liable for all damages sustained by the plaintiff regardless of the extent of the


88. Note, Recent Developments in Joint and Several Tort Liability, 14 Baylor L. Rev. 421, 422-23 (1962).


90. Losses are distributed either during plaintiff’s prima facie case, or during contribution actions. See generally Prosser & Keeton, supra note 87, §§ 46-52.
defendants' individual participation. Entire liability, by contrast, arose when the defendants' acts were independent of each other but concurred to cause an indivisible injury. Each defendant was liable for the plaintiff's entire damages even though the defendants did not owe the plaintiff a common duty and did not act in concert.

Originally entire liability was imposed only when there was no reasonable alternative. Over the years, however, courts began to impose liability on each of two or more defendants for the entire amount of the plaintiff's loss in a number of recurring fact situations. Today, the imposition of entire liability is so common that the rule can be restated in positive terms, rather than as an exception: entire damages will be imposed on multiple defendants unless it is possible to apportion the plaintiff's damages. The following discussion identifies various situations in which the courts have imposed entire liability and describes the reasons for imposing entire liability in each situation.

1. **Concert of Action**

Persons who act in concert are liable for the entire result of their action. All that is required to prove concert of action is mutual design or understanding. In the eyes of the law, this is a joint enterprise in which "the act of one is the act of all." Entire liability is logical in such a case because the joint enterprise causes a single indivisible injury. As a matter of policy, courts have decreed that any person participating in a joint enterprise should be responsible for the entire injury regardless of her individual participation.

2. **Vicarious Liability**

A tort committed within the scope of employment or agency also uniformly yields imposition of joint and several liability. The doctrine of *respondeat superior* holds the principal responsible for the entire con-

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91. See infra notes 94-97 and accompanying text.
92. See infra notes 104-11 and accompanying text. Prior to adoption of liberalized codes of civil procedure, it was important to distinguish between the two types of liability because in the former case all defendants could be joined in one action whereas, in the latter, joinder was not permitted. The distinction has largely lost its significance now that joinder of all defendants is widely permitted regardless of their relationship to each other. See generally Jackson, *Joint Torts and Several Liability*, 17 TEX. L. REV. 399 (1939); Prosser, *Joint Torts and Several Liability*, 25 CALIF. L. REV. 413 (1937).
93. PROSSER & KEETON, supra note 87, at 328-30.
94. Id. at 322-24; Prosser, supra note 92, at 414, 429-30.
95. Prosser, supra note 92, at 430.
96. PROSSER & KEETON, supra note 87, at 323 (quoting Sir John Heydon's Case, 77 Eng. Rep. 1150 (1613)).
97. See, e.g., Jackson, supra note 92, at 403.
98. PROSSER & KEETON, supra note 87, at 347; Prosser, supra note 92, at 430-31.
99. For an explanation of the term *respondeat superior* and its historical significance, see PROSSER & KEETON, supra note 87, at 449-50.
sequences of the agent's or employee's acts. This doctrine reflects a policy determination that those who profit from an enterprise ought to pay for its full costs—including the torts of employees—and that between an innocent plaintiff and a "deep pocket" employer able to distribute the costs of the plaintiff's injuries, the employer ought to pay the costs.\textsuperscript{100} As with concert of action, the acts of the defendants are legally indistinguishable and offer no basis for a division of responsibility for the single injury.\textsuperscript{101}

3. Common Duty

When two or more persons are under a similar duty to the plaintiff and each fails to satisfy that duty, each will be liable for the entire injury.\textsuperscript{102} This situation differs slightly from vicarious liability in that all the defendants have acted, or have failed to act, in a manner that injured the plaintiff. Because the plaintiff has suffered a single indivisible injury and there is no reasonable basis upon which to apportion the damages among the defendants, the imposition of entire liability is justified.\textsuperscript{103}

4. Independent Concurrent Causation of Single Indivisible Injury

There are four types of cases in this class. In one type, the independent act of a single defendant would not have caused an injury, but the combined acts of the defendants resulted in a single indivisible injury.\textsuperscript{104} In another, the acts of a single defendant would have been sufficient to produce some, but not all, of the damage.\textsuperscript{105} In the third, any one of the defendant's acts would have caused the same injury as their combined acts.\textsuperscript{106} In the final type of case, the injury was caused when an act of a defendant concurred with a condition previously created by

\textsuperscript{100} See id. at 450-51.
\textsuperscript{101} Prosser, \textit{supra} note 92, at 430.
\textsuperscript{102} A good illustration of this type of case is the fall of a party wall because of the negligence of the adjoining landowners. Each landowner owed a duty to maintain the wall and each will be liable for the entire damage caused by the fall. See PROSSER \& KEETON, \textit{supra} note 87, at 347; Prosser, \textit{supra} note 92, at 431.
\textsuperscript{103} An analogy could be drawn here to the hazardous waste cleanup situation if it were possible to define a common duty imposed on the PRP's (e.g., a duty to dispose of hazardous waste in a safe manner). Prior to the enactment of RCRA, however, there was no clearly defined duty imposed on those who disposed of hazardous wastes. Even RCRA did not define a "safe" method of disposal.
\textsuperscript{104} Jackson, \textit{supra} note 92, at 407-11; Prosser, \textit{supra} note 92, at 439-41. For example, two persons dump debris into a stream; the debris settles in a dam, causing the stream to overflow onto the plaintiff's land. Neither defendant's act alone would have been sufficient to cause the damage.
\textsuperscript{105} Jackson, \textit{supra} note 92, at 415-19; Prosser, \textit{supra} note 92, at 435-39. A common example is the situation in which separate herds of animals owned by different persons trespass on the plaintiff's land, each herd causing a portion of the total damage.
\textsuperscript{106} Jackson, \textit{supra} note 92, at 413-15; Prosser, \textit{supra} note 92, at 433-34. A good example is the situation in which two fires are independently set, merge together, and burn the plaintiff's property. Either fire alone would have burned the property in the same manner.
another defendant.¹⁰⁷

In all four situations, courts tend to impose entire liability on all defendants¹⁰⁸ because the acts of each defendant have concurred to cause a single injury that is not divisible in any logical, reasonable, or practical fashion. In other words, "[n]o ingenuity can suggest anything more than a purely arbitrary apportionment of such harm."¹⁰⁹ Death of the plaintiff is the most frequently cited example of an indivisible injury.¹¹⁰

In the categories of concert of action, vicarious liability, and common duty, the imposition of entire liability rests upon both the nature of the defendants' acts and the nature of the resulting injury. By contrast, in cases of independent concurrent causation, the sole rationale for imposing entire liability is the indivisible nature of the harm suffered by the plaintiff. The focus is exclusively on the injury. This is a crucial distinction, particularly when one defendant's degree of fault is substantially greater than another's. With respect to incurring joint and several liability for an indivisible injury, a difference in degree of culpability is immaterial. That difference can be of paramount importance, however, when one defendant is seeking contribution from a codefendant.¹¹¹

5. Alternative Liability

Alternative liability is similar to independent concurrent causation in that it involves a group of defendants, all of whom breached some duty owed to the plaintiff. It is clearly distinguishable as a separate category, however, because the individual acts of the defendants do not combine to cause the plaintiff's injury. Instead, the injury is caused by the act of only one defendant. The imposition of joint and several liability on all defendants in alternative liability cases is justified solely by the plaintiff's inability to determine and prove which of the defendants in fact caused his injury.¹¹² Thus, if the defendants cannot prove which tortious act actually caused the particular injury or injuries, all defendants who have breached a duty to the plaintiff will be liable for the full damages. This is

¹⁰⁷. See Jackson, supra note 92, at 411-12. See also Note, supra note 88, at 422.
¹⁰⁹. Id. at 347.
¹¹⁰. Id.
¹¹¹. See infra notes 155-62 and accompanying text.
¹¹². The most celebrated case of this type is Summers v. Tice, 33 Cal. 2d 80, 199 P.2d 1 (1948). Two defendants simultaneously shot at quail in the open range and the plaintiff was struck by the shot from one of the defendant's guns. The plaintiff was not able to prove which defendant fired the shot that struck him. To impose this impossible burden on the plaintiff would guarantee that his case would be dismissed for failure of proof of causation. Rather than create such a result, the California Supreme Court opted to hold the defendants jointly and severally liable. Id. at 81-82, 199 P.2d at 3. The basis of the ruling lies in the judgment that it is better social policy for the plaintiff to recover than for the two negligent defendants to escape liability, even though only one defendant actually caused the injury. Id.
true whether the plaintiff has suffered a single indivisible injury or a multitude of distinct injuries.

Alternative liability also differs from the other categories of entire liability in that alternative liability provides each defendant with an opportunity to avoid joint and several liability. By shifting the burden of persuasion to the defendants, the courts give each defendant a chance to prove that his particular act did not cause the injury. Defendants meeting this burden escape liability entirely. Defendants failing to meet this burden are jointly and severally liable.¹¹³

6. Enterprise Liability

The development of enterprise liability is a recent step by the courts in the progressive expansion of shared liability. In Hall v. E.I. Du Pont De Nemours & Co.,¹¹⁴ a federal district court imposed joint and several liability on all manufacturers of blasting caps for injuries suffered by a child from an exploding blasting cap. In reaching this result, the court examined cases in which entire liability traditionally is imposed¹¹⁵ and identified three common themes: joint or group control of risk, a policy of assigning the foreseeable costs of an activity to those most able to reduce them, and a desire to reduce the plaintiff's burden of proof when the proof of causation is either unavailable or within a defendant's control.¹¹⁶ With these themes in mind, the court analyzed the key facts of the case—that it was impossible to determine who manufactured the blasting cap and that all manufacturers adhered to an industry-wide standard. The court concluded that the plaintiff should be relieved of the burden of proving which manufacturer actually produced the injury-causing cap. The court therefore imposed joint and several liability on the members of the industry. As with alternative liability, each defendant was given the opportunity to prove that it was not the manufacturer of the particular cap that caused the injury.¹¹⁷

Enterprise liability is a hybrid of at least four of the five other categories of entire liability cases.¹¹⁸ It resembles vicarious, concert of action, and common duty liabilities in adhering to the policy of expanding the pool of potential defendants, spreading risk, and deterring injury-

¹¹³. Id. at 86, 199 P.2d at 4. By shifting the burden of persuasion in this manner, the court attempted to lessen the shock of its significant modification of the common law. Theoretically at least, the defendant who was not the cause in fact of the injury could avoid liability by proving that his act did not cause the injury.
¹¹⁵. Id. at 371-79. It should be noted that the court grouped independent concurrent causation cases together with alternative liability cases in its discussion.
¹¹⁶. Id. at 371.
¹¹⁷. Id. at 380.
¹¹⁸. Under enterprise liability there is a direct causal connection between only one defendant and the plaintiff's injury. In this regard it differs from independent concurrent causation liability, in which all defendants in fact have contributed directly to the injury.
causing behavior. It is similar to alternative liability in its concern for the inability of the plaintiff to identify which of several potentially responsible defendants caused the injury.

7. Joint and Several Liability in Cases Traditionally Resulting in Apportionment

Beginning with the case of *Landers v. East Texas Salt Water Disposal Co.*, joint and several liability has been applied in cases traditionally resulting in apportionment, i.e., cases in which defendants' acts or omissions are not joint and do not concur to cause a single condition. The *Landers* exception shifts the burden of apportionment to defendants in cases in which the plaintiff's injury is theoretically divisible but practically indivisible. The basis of the exception is the practical inability of the plaintiff to divide responsibility for her injuries among the several defendants. Each defendant, therefore, is held jointly and severally liable for the entire damage unless he can produce evidence limiting his liability.

The *Landers* exception falls somewhere between concurrent causation liability and apportionment. Entire liability is imposed in cases of concurrent action because the results are theoretically and practically indivisible. On the other hand, apportionment traditionally has been required when the defendants' acts are independent and do not concur to cause a single result because the acts are theoretically and practically divisible. This is true even though the defendants' acts may coincide in time or may be similar in design and conduct. The lack of evidence upon which to apportion damages is not considered a sufficient reason either for relieving the plaintiff of his burden to apportion damages or for requiring one defendant to pay for the damages inflicted by another.

*Landers* falls between these situations because the damages are theoretically divisible but practically indivisible. Shifting the burden of persuasion to the defendants reflects a policy decision that it is more important for the plaintiff to recover than for each defendant's liability to

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119. 151 Tex. 251, 248 S.W.2d 731 (1952). In this case, two pipes, designed to carry salt water and owned by two separate companies, broke at approximately the same time. Salt water drained into the plaintiff's lake, killing fish and causing other damage. *Id.* at 252-53, 248 S.W.2d at 732. Both defendants' pipelines contributed salt water to the lake and caused a portion of the damage.

120. *Id.* at 256, 248 S.W.2d at 734. Where the tortious acts of two or more wrongdoers join to produce an indivisible injury, that is, an injury which from its nature cannot be apportioned with reasonable certainty to the individual wrongdoers, all of the wrongdoers will be held jointly and severally liable for the entire damages and the injured party may proceed to judgment against any one separately or against all in one suit.

*Id.* *See also* Note, supra note 88, at 421-23.

121. PROSSER & KEETON, supra note 87, at 350-51.

122. *See supra* notes 104-11 and accompanying text.

123. PROSSER & KEETON, supra note 87, at 348-52; *Note,* supra note 88, at 421-23.
be restricted to the precise damage caused by that defendant’s actions. This is a relatively recent change in policy that has not been made in all jurisdictions.\textsuperscript{124}

A remaining question is why a shift in the burden of persuasion has been chosen as the means of ensuring that the plaintiff recovers for his injuries. The same end could be achieved by permitting an arbitrary allocation of responsibility by the plaintiff.\textsuperscript{125} A strong justification for shifting the burden of persuasion is that requiring the plaintiff to make an arbitrary apportionment still leaves him with the possibility of an incomplete recovery should one or more of the defendants be either beyond the reach of the court or judgment proof. With joint and several liability that risk is avoided.

8. Joint and Several Liability: Some Conclusions

Analyzing the categories of joint and several liability reveals the underlying reasons why the courts have imposed entire liability.

(1) \textit{Relationship of the defendants.} To spread the risk of injury and to deter wrongful behavior,\textsuperscript{126} defendants who did not physically commit the wrong may be held liable. When there is only one factual wrong and one factual injury, it is impossible to divide liability among the defendants.

(2) \textit{Nature of the harm.} Some injuries, by their very nature, are indivisible. When the physical acts of two or more identified persons concur to cause such injuries, courts have chosen arbitrary apportionment as the method for dividing liability for the injury.\textsuperscript{127}

(3) \textit{Identification of the actual wrongdoer.} In some instances it will be impossible to identify the person whose wrongful act was the direct cause of the plaintiff’s harm. If it is possible to delineate a pool of potential defendants that contains the actual wrongdoer,\textsuperscript{128} all members of the pool may be held jointly and severally liable for the plaintiff’s damages.


\textsuperscript{125}Some jurisdictions in fact do adhere to this policy in certain cases. \textit{See} Prosser \& Keeton, \textit{supra} note 87, at 350-51; Note, \textit{supra} note 88, at 425.


\textsuperscript{127}It is possible to assign responsibility in such cases purely on the basis of the degree of culpability of each defendant. The courts, however, have chosen to make this assignment at the contribution/indemnification stage of the litigation instead of during the plaintiff’s prima facie case. \textit{See infra} notes 155-62 and accompanying text for a discussion of various methods of allocating damages among the defendants.

\textsuperscript{128}Such a pool is established in one of two ways. It may include all persons who physically acted in a tortious manner toward the plaintiff, although only one person’s act was the direct cause in fact of the injury. \textit{E.g.}, Summers v. Tice, 33 Cal. 2d 80, 199 P.2d 1 (1948). The pool also may be defined as all who potentially could have acted tortiously toward the plaintiff, as in the case of Hall v. E.I. Du Pont De Nemours & Co., 345 F. Supp. 353
Given a choice between leaving an injured plaintiff uncompensated and requiring a potentially innocent defendant to pay damages, the courts have made a policy decision to compensate the plaintiff because the defendants have profited from activities of the kind that caused the plaintiff's injuries.

(4) Inability of plaintiff to apportion. Some plaintiffs may be injured by the separate and distinct acts of two or more defendants. It will often be impossible for the plaintiff to prove the extent to which his injuries were caused by the acts of a particular defendant. A court presented with such a case has three choices: dismiss the plaintiff's suit for failure to prove responsibility for damages, permit the plaintiff to make an arbitrary allocation of responsibility, or impose joint and several liability and shift to the defendants the burden of proof on allocating liability. Courts in most jurisdictions have chosen to rely on joint and several liability, rejecting the first alternative because it is contrary to the policy of providing full compensation to injured parties and the second because it allows the possibility of an incomplete recovery if a defendant is judgment proof.

Of the four reasons examined above for imposing entire liability, the first three reasons justify including joint and several liability in a CERCLA liability allocation formula. Given the enormous costs of cleaning up hazardous waste sites, every effort should be made to spread responsibility for cleanup costs over as large a group as possible. In addition, the "injury" that CERCLA is designed to address is the presence of hazardous waste at a particular location where it poses a risk to the public or the environment. Any person responsible for the presence of hazardous waste at that location is liable for the cleanup costs. In this sense, liability is imposed for an indivisible injury, because as it stands there is no efficient method for apportioning the individual liability of multiple defendants at hazardous waste sites.129 Finally, the lack of adequate evidence for "fingerprinting" all the wastes at a particular site will make it impossible to identify all of the parties whose acts caused the injury.130 Thus, three of the principal reasons for imposing joint and several liability apply to CERCLA: the need to spread costs and risk, the lack of a sufficient basis for assigning responsibility for the injury, and the inability to identify all the parties who contributed to the injury.

The fourth reason—shifting the burden of proof when the plaintiff is unable to prove apportionment, as in the Landers case—may not be applicable to CERCLA cases. The federal government will be the plaintiff in nearly all such cases, and it is not clear that the government should be

129. See infra note 187 and accompanying text.
130. See supra note 17.

(E.D.N.Y. 1972). In the first situation, the physical facts are relevant to defining the pool. In the latter, policy judgments are more relevant.
protected from an incomplete recovery in the same manner as an individual plaintiff. At many hazardous waste sites, the only equitable means of apportioning cleanup costs will be through an arbitrary assignment of responsibility. Nevertheless, use of joint and several liability improves CERCLA's ability to meet the objectives set for it by Congress, and it should remain a part of a CERCLA liability allocation formula.

B. Market Share Liability

Courts recently have expressed a willingness to go beyond joint and several liability by fashioning creative allocations of responsibility that resemble joint and several liability in shifting the burden of proof, but that also equitably allocate liability among various defendants.

In *Sindell v. Abbott Laboratories*, a multiple-defendant products liability case, the California Supreme Court allocated responsibility for the plaintiff's damages on the basis of the defendants' relative shares of the product market. Sindell's mother had taken diethylstilbestrol (DES) during her pregnancy to prevent miscarriage. DES may cause vaginal and cervical cancer in females exposed to the drug before birth. It also causes adenosis, an abnormal vaginal and cervical condition, which the plaintiff alleged was precancerous. The court stated that as a result of her exposure, the plaintiff developed a malignant bladder tumor requiring surgical removal, and that she suffered from adenosis, which required constant monitoring to detect malignant changes. The plaintiff filed suit against eleven manufacturers of DES, seeking damages on the theory that the defendants were individually and jointly liable for producing and marketing the drug without adequate testing. Her appeal involved five of the defendants named in the complaint.

DES was manufactured from an identical formula by at least 200 companies and was widely available as a generic drug before the Food and Drug Administration banned it in 1971. Plaintiff, through no fault of her own, was unable to determine which firm supplied the DES taken by her mother and, therefore, was unable to prove cause in fact. To avoid dismissal on these grounds, plaintiff argued three theories of liability: alternative, enterprise, and concert of action. Concluding that none

132. Id. at 593, 607 P.2d at 925, 163 Cal. Rptr. at 133.
133. Id. at 594, 607 P.2d at 925, 163 Cal. Rptr. at 133.
134. Id. at 594-95, 607 P.2d at 926, 163 Cal. Rptr. at 134. The court's opinion was based on the assumption that plaintiff's allegations of injury were true. Although the development of adenosis and clear-cell adenocarcinoma has been demonstrated to be associated with in utero exposure to DES, bladder cancer has not been thus associated. See, e.g., Stillman, *In utero exposure to diethylstilbestrol: Adverse effects on the reproductive tract and reproductive performance in male and female offspring*, 142 AM. J. OBSTET. GYNECOL. 905, 906, 917-18 (1982).
of these theories adequately fit the facts of the case,\textsuperscript{136} the court went on to develop a prima facie case by fashioning its market share theory of liability.

Under the market share theory, a plaintiff can establish a cause of action by demonstrating that the named defendant manufacturers together held a "substantial percentage" of the market for the injury-causing product at the time of exposure.\textsuperscript{137} Once a plaintiff has met this burden, the defendants individually are given the opportunity to demonstrate that their product could not have been the cause in fact of the injury. The defendants also are permitted to implead other manufacturers of the product who were not named by the plaintiff. Liability for the plaintiff's damages is then allocated among all defendants unable to disprove their liability, according to their respective market shares.\textsuperscript{138}

\textit{Sindell} represents a classic case of the court deciding what the result should be and then developing the law to support its decision. In most cases this judicial method does not require the court to establish new social policy; the court can find sufficient legal precedent to justify its decision. In some cases, however—and this is clearly one of them—it is impossible to conform the facts of the case and the chosen result with prior legal doctrine no matter how much twisting and shoving is done.

Because of the qualities of DES injuries—the long latency period between the intergenerational exposure and effect—it was likely that some of the manufacturers of DES had gone out of business prior to the plaintiff filing suit. As a consequence, the court could not permit the plaintiff to recover from a pool of defendants and still guarantee that the actual wrongdoer would be included in that pool.\textsuperscript{139} Recognizing this,

\begin{itemize}
  \item \textsuperscript{136} See \textit{id.} at 598-613, 607 P.2d at 928-38, 163 Cal. Rptr. at 136-46. The court rejected alternative liability because it requires, at a minimum, a reasonable possibility that each defendant was the cause in fact of the injury. No such possibility existed with respect to the DES manufacturers named in plaintiff's complaint. \textit{id.} at 602, 607 P.2d at 930-31, 163 Cal. Rptr. at 138-39.

  \item Plaintiff's concert-of-action theory was based on industry-wide use of identical test data, marketing techniques, and promotional devices. Although acknowledging such industry-wide use, the court found no "tacit understanding or ... common plan among defendants to fail to conduct adequate tests or give sufficient warnings" and, therefore, rejected this theory as well. \textit{id.} at 604-05, 607 P.2d at 932-33, 163 Cal. Rptr. at 140-41.

  \item Finally, the court refused to apply the enterprise liability theory of \textit{Hall} v. E.I. Du Pont De Nemours & Co., 345 F. Supp. 353 (E.D.N.Y. 1972) for two reasons: (1) there was insufficient cooperation among the 200-plus drug manufacturing firms, as compared to the degree of cooperation among the six members of the blasting cap industry; and (2) the safety standards of the drug manufacturing industry are largely determined by the federal Food and Drug Administration—they are not self-imposed. \textit{Sindell}, 26 Cal. 3d at 609-10, 607 P.2d at 935, 163 Cal. Rptr. at 143.

  \item \textsuperscript{137} \textit{Sindell}, 26 Cal. 3d at 611-12, 607 P.2d at 937, 163 Cal. Rptr. at 145. The court did not define "substantial percentage" but did cite as an example the 75\% to 80\% suggestion found in the Note cited supra note 126, at 996.

  \item \textsuperscript{138} \textit{Sindell}, 26 Cal. 3d at 612, 607 P.2d at 937, 163 Cal. Rptr. at 145.

  \item \textsuperscript{139} \textit{id.} at 610-11, 607 P.2d at 936-37, 163 Cal. Rptr. at 144-45.
\end{itemize}
the court proceeded to make a policy judgment and, to its credit, acknowledged that it was doing so.\footnote{Id. at 610-12, 607 P.2d at 936-37, 163 Cal. Rptr. at 144-45. The basis of this policy judgment was twofold: (1) as between an innocent plaintiff and a class of defendants the members of which are culpable in some degree, the risk of loss should fall on the latter; and (2) the risk of loss must be spread out, not imposed on an unfortunate few. Id.}

The policy judgment made in \textit{Sindell} permitted the plaintiff to meet her burden of proof as to cause in fact on the basis of statistical probability. The court judged that because all manufacturers produced the drug pursuant to an identical formula, a firm's share of the market was indicative of the likelihood that the firm had supplied the tablets actually taken by the plaintiff's mother. Requiring the plaintiff to prove that the named defendants controlled a "substantial percentage" of the market created a high probability that the drug supplied by one of those defendants was the cause in fact of the plaintiff's injury. Accordingly, the court found little injustice in shifting the burden to the defendants to demonstrate that they could not have produced the particular drug taken by the plaintiff's mother.\footnote{Id. at 612, 607 P.2d at 937, 163 Cal. Rptr. at 145.}

Relying upon market share to establish causation provided the court with a convenient means of apportioning damages among the defendants: each defendant is liable for the proportionate share of the damages represented by its share of the product market.\footnote{Id. The court did not expressly address the problem of the "unassigned" share of the market. Presumably, the unassigned portion would be attributable to potential defendants who were not sued and to defendants who demonstrated that they could not have caused the injury. This unassigned share would be rolled into the assigned share on a pro rata basis. In other words, the "substantial share" would be equated with a 100% share after all the defendants had been given the opportunity to implead additional defendants and to prove their own lack of culpability. \footnote{See infra notes 147-53 and accompanying text.}} The court, however, could have decided to apportion liability instead of imposing joint and several liability on all of the defendants. After all, joint and several liability follows from alternative and enterprise liability, under which the defendants are left to allocate the damages among themselves by contribution.\footnote{See \textit{Sindell}, 26 Cal. 3d at 612, 607 P.2d at 937, 163 Cal. Rptr. at 145.}

Two related factors explain the court's decision to apportion liability according to market share rather than impose joint and several liability. First, the court was concerned about the injustice in allowing proof of causation to be satisfied by proof of substantial probability that the defendant caused the injury.\footnote{See Sindell, 26 Cal. 3d at 610-12, 607 P.2d at 936-37, 163 Cal. Rptr. at 144-45. The basis of this policy judgment was twofold: (1) as between an innocent plaintiff and a class of defendants the members of which are culpable in some degree, the risk of loss should fall on the latter; and (2) the risk of loss must be spread out, not imposed on an unfortunate few. Id.} This injustice was diminished by requiring the plaintiff to bear the burden of persuasion on apportionment. Second, bearing that burden did not impair the plaintiff's ability to recover. To prove that the defendants represented a "substantial percentage" of the market, the plaintiff only needed to show a rough approximation of each
defendant’s market share. Using that same proof, the plaintiff was able to apportion damages.

Market share liability is best analyzed by comparing it to alternative and enterprise liability. The stimulus behind all three theories is the plaintiff’s inability to identify the party who in fact caused the injury. Rather than permit this situation to deny the plaintiff a recovery, courts relying on alternative and enterprise liability have determined that it is better social policy to hold all potentially responsible defendants jointly and severally liable for the entire damages. These decisions constitute a significant departure from traditional tort law. Nevertheless, these cases are generally accepted because the party actually causing the injury was sure to be among the class of liable defendants, and each defendant had the opportunity to prove that it did not cause the injury. Market share liability is critically different because it abandons this saving grace, sanctioning a cause of action and a shift of the burden of proof to defendants even though the party who caused the injury is not necessarily before the court.

The essential question of Sindell was how to use traditional tort concepts to establish liability for a nontraditional injury. Under CERCLA, Congress has established liability for another nontraditional injury, but neither the courts nor Congress has determined how to allocate that liability within the class of parties to which it was assigned. The creative application of traditional tort principles by the Sindell court provides guidance for allocating CERCLA liability.

In the context of CERCLA, the volume of waste that a PRP is re-

145. See supra notes 112-18 and accompanying text.

146. Another manner in which market share liability differs significantly from alternative and enterprise liability is the degree of fault of the defendants. In alternative liability, all defendants have breached some duty owed to the plaintiff. Under enterprise liability, all defendants have engaged in wrongful action that has contributed to the plaintiff’s injury. Neither, however, is necessarily the case in market share liability. Market share liability does not require that the plaintiff demonstrate that all defendants participated in some type of wrongful conduct or scheme. All that need be shown is that each defendant is among the class of persons who manufactured the injury-causing agent.

For a case going beyond Sindell in this regard, see Collins v. Eli Lilly Co., 116 Wis. 2d 166, 342 N.W.2d 37 (1984). Collins also involved injuries caused by exposure to DES. Relying upon a provision of the Wisconsin Constitution that guarantees all persons a remedy for all injuries, Wis. Const. art. I, § 9, the court fashioned a “risk contribution” theory of liability. The court first determined that, because of its latent injury-causing characteristics, DES constituted a risk to the public at large and, consequently, to the individual plaintiff. From this the court reasoned that any company that manufactured and marketed DES contributed to that risk and, therefore, was liable to the plaintiff. Collins, 116 Wis. 2d at 191-93, 342 N.W.2d at 49-50. Although this analysis does not differ much from the California Supreme Court’s reasoning in Sindell, the Wisconsin court went a step further and found that the plaintiff need only sue one defendant. The plaintiff could recover her entire damages from that defendant under the “risk contribution” theory. The market share theory used in Sindell was rejected because of the cumbersome and time-consuming process of defining the market and determining market shares. Id. at 193, 342 N.W.2d at 50.
sponsible for contributing to a site is comparable to a defendant’s market share in *Sindell*. The volume may not bear a direct relationship to the degree of health or environmental risk posed by the site, but it does provide a readily ascertainable yardstick for measuring the defendant’s degree of contribution to the condition of the site as a hazardous waste site. Thus, an initial allocation of liability under CERCLA that relies solely on the volume of waste for which a PRP is responsible would be entirely consistent with *Sindell*.

C. Contribution

Contribution is an equitable tool designed to mitigate the harsh effects of joint and several liability by spreading the ultimate obligation to pay for the plaintiff’s judgment. Any defendant who has paid more than his fair share to the plaintiff is entitled to reimbursement from defendants paying less than their fair share.¹⁴⁷ The celebrated case of *Merryweather v. Nixan* established a “no contribution” rule in multiple-defendant cases.¹⁴⁸ Since *Merryweather*, however, the rule has evolved so dramatically that today over forty jurisdictions in the United States permit contribution in a variety of situations either by statute or by judicial decision.¹⁴⁹

One reason for not allowing contribution is the principle that a court ought not to provide relief to a party whose claim rests solely on his own wrongdoing.¹⁵⁰ An unbending application of this reasoning would preclude contribution in cases involving concert of action, common duty, or concurrent acts with single results, because all defendants in such cases are actual (as opposed to legal) wrongdoers. Nevertheless, because an overwhelming majority of jurisdictions now permit contribution,¹⁵¹ it is clear that courts and legislatures have found doing justice to the defendants more compelling than adhering to the historic prohibition

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¹⁵⁰. PROSSER & KEETON, supra note 87, at 336.

¹⁵¹. *Id.* at 338; Landes & Posner, supra note 149, at 550-51. The differences that do exist between jurisdictions primarily concern the pool of potential defendants that are subject to a contribution action. Some jurisdictions allow contribution from all joint tortfeasors whether or not they are named in the complaint or judgment, whereas others allow contribution only from joint tortfeasors named in the judgment. *Id.* at 550.
against providing relief to a wrongdoer. As Prosser said:

There is obvious lack of sense and justice in a rule which permits the entire burden of a loss, for which two defendants were equally, unintentionally responsible, to be shouldered onto one alone, according to the accident of a successful levy of execution, the existence of liability insurance, the plaintiff’s whim or spite, or the plaintiff’s collusion with the other wrongdoer, while the latter goes scot free.

Beyond the initial question of whether a right of contribution should exist, the question most relevant to a discussion of allocating liability under CERCLA is how the defendants’ “fair shares” are determined. There are three methods of allocating damages among the defendants. The first, based on the rule that “equality is equity,” divides the damages equally among the defendants regardless of their degree of fault or their relative causal contribution to the plaintiff’s injuries. Although simple and easy to administer, in all but a very few cases this method fails to guarantee that the defendants will be treated equitably, thus defeating the primary purpose for permitting contribution.

152. Many jurisdictions still adhere to this prohibition, however, in the case of intentional torts. PROSSER & KEETON, supra note 87, at 339.

153. Id. at 337-38.

154. An excellent analysis of the policies for and against contribution can be found in the struggle of the federal courts over whether to create a federal common law of contribution in private antitrust actions for treble damages. The federal antitrust laws are silent on the issue of contribution among multiple violators. The absence of an express right of contribution, however, has not prevented antitrust defendants from asking the federal courts to approve such a right. Accordingly, the issue has generated several federal decisions and a substantial array of comment in legal periodicals. See, e.g., Texas Indus., Inc. v. Radcliff Materials, Inc., 451 U.S. 630 (1981) (Supreme Court declined to provide a right of contribution, leaving the matter for Congress to decide); Professional Beauty Supply, Inc. v. National Beauty Supply, Inc., 594 F.2d 1179 (8th Cir. 1979) (contribution among joint tortfeasors in federal antitrust actions is allowed, but not indemnity); Sabre Shipping Corp. v. American President Lines, 298 F. Supp. 1339 (S.D.N.Y. 1969) (nonsettling defendants in antitrust suits have no right to contribution or indemnity against settling defendants); Clinton, The Law of Contribution: Its Common Law Origins and Current Status in Federal Litigation, 48 ANTITRUST L.J. 1588 (1979) (forecasting that Congress and the courts soon would decide whether and how contribution should apply in antitrust cases); Easterbrooke, Landes & Posner, Contribution Among Antitrust Defendants: A Legal and Economic Analysis, 23 J.L. & ECON. 331 (1980) (arguing that a rule of no contribution provides the greatest deterrence to violations of antitrust law because of the greater risk to each defendant); Sellers, Contribution in Antitrust Damage Actions, 24 VILL. L. REV. 829 (1979) (arguing that a uniform federal law should not provide a right of contribution from settling defendants); Note, There is No Basis in Federal Statutory or Common Law for Allowing Federal Courts to Fashion a Right of Contribution Among Antitrust Wrongdoers—Texas Industries, Inc. v. Radcliff Materials, Inc., 101 S. Ct. 2061 (1981), 50 U. CIN. L. REV. 821 (1981) (author claims that the Court’s failure in Texas Industries to formulate a rule allowing contribution violated considerations of fairness and equity).

155. PROSSER & KEETON, supra note 87, at 340.

156. Comment, supra note 149, at 1255.

157. Id. at 1254. But see Comment, Comparative Contribution and Strict Tort Liability: A Proposed Reconciliation, 13 CREIGHTON L. REV. 889, 900-06 (1980) (arguing that pro rata apportionment may be the only fair method in products liability cases in which multiple defendants are held liable under different theories).
The second method requires courts to allocate damages according to the relative degree of fault of each defendant (i.e., the degree to which each defendant's behavior exceeded the standard of reasonable conduct). This approach is designed to produce more equitable results than an equal division.\textsuperscript{158} A party's degree of fault, however, does not necessarily bear any relationship to the amount of harm caused by that party. For example, assume that the plaintiff's automobile was struck simultaneously by defendant A's automobile and defendant B's automobile. Defendant A was exceeding the speed limit by ten miles per hour and defendant B was exceeding it by five miles per hour. Defendant A was more at fault than defendant B because A's behavior exceeded the standard by twice as much. There is no guarantee, however, that the amount of damage inflicted on the plaintiff by defendant A is twice as great as the amount of damage inflicted by defendant B. Thus, allocation of liability on the basis of relative degree of fault is arbitrary and potentially punitive. Punishment may be a great deterrent to some types of injury-causing behavior, but it is questionable whether a punitive allocation of liability is equitable.

A more practical consideration is that establishing relative degrees of culpability is difficult, requiring considerable court time and resources. First, the court must define the standard of conduct that each defendant must meet. Next, the trier of fact must decide whether each defendant has breached that standard. These two steps determine whether fault exists at all. Finally, the court must determine the relative fault of each party by comparing the standard to which each is held and the degree to which each breached that standard. In the typical negligence case the first two steps must be taken regardless of the method used to allocate damages. The third step logically follows and provides a convenient basis for allocating responsibility for the plaintiff's damages. In a strict liability setting, by contrast, no judgments of fault need be made. Putting the court through the complicated and inexact exercise of determining relative fault in a strict liability case is an inefficient use of judicial resources.

The third method for allocating liability is relative causation. This method allocates damages according to estimates of the degree to which each defendant causally contributed to the plaintiff's harm.\textsuperscript{159} There are three reasons for allocating liability on the basis of relative causation. First, as discussed above, it is more equitable than either an equal division or a fault-based allocation.\textsuperscript{160} Second, relative causation generally is

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\textsuperscript{158} Comment, supra note 149, at 1255-56.
\textsuperscript{159} For a discussion of cases in which courts have applied the relative causation theory, see Rizzo & Arnold, Causal Apportionment in the Law of Torts: An Economic Theory, 80 COLUM. L. REV. 1399, 1402 n.20 (1980).
\textsuperscript{160} Id. at 1402. The authors based their argument that relative causation is more equita-
\end{footnotesize}
much easier to administer than relative fault, particularly in a strict liability case. Finally, relative causation permits an assignment of liability in cases presenting issues of intervening cause.

This analysis of the different methods of determining a defendant's "fair share" in a contribution action demonstrates the value of a formula for allocating CERCLA liability on the basis of relative causation. CERCLA liability is premised on causation, not fault. Indeed, many PRP's are free from fault in the traditional tort sense. They are liable for cleanup costs under CERCLA merely because of their association with the site. Thus, a causation-based formula for allocating liability is consistent with the initial causation-based imposition of liability.

A relative causation formula also would be simpler to administer than a fault-based formula, particularly if the formula were to rely exclusively on volume contributions of waste. With a volume-based formula, neither the court nor EPA would need to devote time and resources to determining which PRP's exceeded acceptable standards of conduct by the greatest margin. Given that many of the wastes now being cleaned up were disposed of prior to the establishment of any standards of disposal, determining degrees of "fault" could prove impossible.

Finally, allocating liability on the basis of causation is likely to be viewed by the PRP's as a more equitable system than a fault-based formula. Therefore, a causation-based formula should provide greater encouragement to PRP's to enter into negotiated cleanups.

D. Thoughts Drawn from CERCLA Legislative History

All of the early versions of CERCLA contained specific provisions respecting allocation of the liability created by the Act. By the time CERCLA finally passed both the House and Senate, however, all provisions relating to the allocation of liability had been deleted. Nonetheless, the provisions contained in those early drafts provide valuable guidance for devising a liability allocation scheme under the present CERCLA statute.
A common ingredient present in all the early draft versions of the Act was the imposition of joint and several liability for cleanup costs. The reasons cited for making liability joint and several under CERCLA were the same as those used to justify joint and several liability in other multiple-defendant situations.\(^{166}\) Given the complexity of the problem of abandoned hazardous waste disposal sites, it seemed extraordinarily unfair to place the burden on the plaintiff (whether an individual or the federal government) to find every responsible party, obtain jurisdiction over each, and prove each defendant's proportionate contribution.

The feeling in Congress was that defendants in a typical CERCLA case may not be in a better position to provide evidence relating to each party's contribution to the problem. Usually, however, they are in a better position to spread the costs of cleanup because they have profited from engaging in the activity that generated the hazardous waste. These factors justified shifting the burden of proof on apportionment to the defendants.\(^{167}\) Moreover, proponents of joint and several liability generally believed that it provided the best system for deterring improper hazardous waste disposal and the best means for the government to recover cleanup costs expended by the Superfund.\(^{168}\)

Joint and several liability under CERCLA was not a point upon which all members of Congress agreed. All of the draft versions of CERCLA in both the House and the Senate contained express provisions for imposing joint and several liability, and provisions for mitigating the inequitable impacts of that liability in particular situations. As these bills progressed through both houses, however, there were repeated attempts to nullify the effects of joint and several liability.\(^{169}\) As a consequence, CERCLA contains neither an express joint and several provision nor any provisions relating to allocation of liability.

Proponents of the early draft versions of the Act relied on the most basic rationale for joint and several liability—that as between an innocent plaintiff and a class of defendants who profited from activities that created hazardous waste, the burden of demonstrating each defendant's contribution to the injury should be placed on the defendants.\(^{170}\) Beyond this fundamental point of agreement there was a clear conflict between the need to provide for quick and efficient cleanups and the desire to be equitable to the defendants. It appears that the former prevailed over the

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\(^{166}\) For a summary of the principal justifications for applying joint and several liability, see supra notes 91-130 and accompanying text.


\(^{169}\) See supra note 164.

\(^{170}\) See supra note 164 and accompanying text.
latter. In the Senate there was never any question which of the two had priority, and in the House, after the adoption of the Gore amendments, there was little doubt that equitable treatment of defendants took a back seat to recovery of cleanup costs.

The legislative history tracking the liability provisions of CERCLA draws into focus the two fundamental considerations for developing a liability allocation scheme. The first consideration is the need to preserve the Superfund. If it is used to finance cleanups that responsible solvent parties could fund, it may not be available to finance response actions for which no responsible solvent parties exist. The second consideration is the need to encourage voluntary action. Without privately financed cleanups, the overall objectives of the Act—cleaning up as many sites as possible in the shortest time period, at the lowest cost—will be frustrated. The ideal liability allocation scheme is one that strikes a delicate balance between these two considerations.

III
THE "CARROT AND STICK" FORMULA FOR ALLOCATING SUPERFUND LIABILITY

Based on the foregoing examination of traditional and evolving tort concepts and of the legislative history of the Superfund statute, this Section presents a CERCLA liability allocation scheme that encourages voluntary action while preserving the Superfund.

Congress can learn a great deal about creative applications of traditional liability concepts from the Sindell case. Hazardous waste disposal sites present a social problem of monumental proportions, to which CERCLA offers an innovative legal response. CERCLA's innovation ends, however, at the point of liability allocation. As a result, the Act has failed to achieve even a modicum of its vast potential. To reach that potential, Congress must also create an innovative mechanism for allocating CERCLA liability.

The key ingredient of any liability allocation system is a precise designation of the factual basis upon which any division of responsibility rests. An extremely varied array of facts could be relevant to an allocation of CERCLA liability. CERCLA, EPA's settlement policy, and section 122(a) of SARA all attempt to incorporate the entire array of


172. It should be noted that both the House and the Senate bills also contained victim compensation programs until final passage. See Grad, supra note 20, at 19-22. The potentially enormous costs of these programs more than likely played the determinative role in keeping the policy of rapid and full recovery paramount throughout the entire process.

173. These factors include the volume of the waste, the nature (i.e., toxicity and mobility) of the waste, the PRP's ability to pay, the strength of the evidence linking the waste to the
such facts into a liability allocation scheme.\textsuperscript{174} These attempts, however, have resulted in imprecise, incalculable, “hand-waving” formulas that merely require EPA to “consider” those factors when making a preliminary allocation of responsibility.\textsuperscript{175}

This “hand-waving” approach fails to satisfy either of the two means by which settlement is encouraged—predictable results and positive incentives for reaching agreement. The absence of a precise formula indicating how much weight will be given to each factor makes it impossible for PRP’s to predict accurately how much they ultimately will pay. In addition, reliance on the whole panoply of factors that affect the condition of a waste site obscures whatever positive incentives for settlement may be inherent in the allocation scheme.

\textit{A. Description of the Allocation Scheme}

The best liability allocation scheme for encouraging voluntary clean-ups consists of two formulas, applied in two separate stages. One of these formulas would rely exclusively on the volume of waste attributable to a particular PRP and would serve as the basis for an initial assignment of responsibility. PRP’s would be able to satisfy their liability on the basis of this assignment and escape all further liability for conditions at the site.

In addition, joint and several liability would be retained as a cornerstone of the CERCLA liability allocation scheme. Its use will protect the Superfund from bearing a disproportionate share of response costs when potentially responsible parties are insolvent or unidentified. Joint and several liability cannot be applied across the board, however, if the liability allocation scheme is going to encourage voluntary action. A modified application of joint and several liability would be fairer to PRP’s.

All PRP’s who forgo the opportunity to satisfy their liability exclusively on the basis of volume would be jointly and severally liable for fifty percent of the total response costs. These PRP’s then would be able to allocate their liability according to a second formula similar to the one currently used by EPA (i.e., a formula that considers the entire array of factors that affect conditions at the site). Allocation under this formula would be available only after the response action is complete and only in contribution actions.

\textsuperscript{174} For a discussion of factors motivating the drafters of CERCLA to advocate joint and several liability, see supra notes 164-68 and accompanying text. See Mays, supra note 3, at 10-11, for a review of the criteria used by EPA in evaluating PRP settlement offers. See also SARA § 122(a), 42 U.S.C.A. § 9622(e)(3)(A) (West Supp. 1987) (enumerating the factors to consider in allocating liability under CERCLA).

\textsuperscript{175} See SARA § 122(a), 42 U.S.C.A. § 9622(e)(3)(A).
**I. Formula One: Unadjusted Volume Shares**

Initial volume assignments would be made without regard to the actual number of PRP's who contributed waste to the site. These initial volume assignments (hereinafter unadjusted volume shares) could be expressed in terms of percentages. For generators and other owners of waste, the unadjusted volume share would be determined by dividing the quantity of waste each generator sent to the site by the total quantity of waste at the site. For transporters, the unadjusted volume share would be the quantity each hauled to the site divided by the total quantity found at the site. Finally, for owners and operators of the facilities, the unadjusted volume share would be the quantity of waste disposed of at the site during their tenure divided by the total amount of waste found at the site at the time of cleanup.\(^{176}\) Thus, a defendant's unadjusted volume share would equal his degree of contribution to the condition of the site, expressed as a percentage of the total cleanup costs. For example, a PRP whose unadjusted volume share is ten percent would have to offer to pay ten percent of the total response costs in order to settle and to receive a release from future liability.

Before undertaking a response action, EPA would be required to make an allocation of responsibility for all identifiable PRP's on the basis of unadjusted volume shares. Settlement offers from PRP's that equal their percentage share would be accepted by the government. If the full amount of the response cost is not offered in the form of unadjusted volume shares, EPA would be authorized to use monies from the Superfund to make up the difference. All PRP's who settle on the basis of their unadjusted volume share would receive a release from future liability and immunity from contribution claims. Any PRP receiving a release thereby would waive its right to seek contribution from other PRP's.

EPA would bear the initial burden of proving the unadjusted volume share of each PRP who does not offer to settle on the basis of that share. If the government proves a defendant's relative contribution of waste to the site by volume, that defendant would be liable for response costs according to its respective unadjusted volume share. Defendants whose volume contributions are not proven adequately by the plaintiff would then be given the opportunity to prove their own unadjusted volume shares. All defendants whose unadjusted volume shares still have not been satisfactorily demonstrated would be jointly and severally liable for the balance of the response costs. In order to encourage EPA to accept settlement offers based on unadjusted volume shares, the amount of

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176. Assume there are one million pounds of waste at the site. Generator A contributed 100,000 pounds; its volume share will be 10%. Transporter X hauled a total of 200,000 pounds of waste from several different generators to the site; its volume share will be 20%. Owner 2 owned the site for 10 years, during which a total of 500,000 pounds of waste was dumped; its volume share will be 50%. 

response costs that could be collected under joint and several liability would be limited to fifty percent of the total response costs. The Superfund would bear the burden of any shortfall resulting from EPA's failure to prove and collect at least fifty percent of the total response costs from defendants on the basis of unadjusted volume share.

For example, suppose that EPA can only prove volume contributions that represent forty percent of the total cleanup cost, and no other defendants come forward with adequate proof of their volume contributions. Under the proposed scheme, EPA could assign fifty percent of the total cost, on a joint and several basis, to defendants whose contributions had not been proven. In this manner, EPA would collect ninety percent of the total cleanup cost from PRP's. EPA, through Superfund expenditures, would then take responsibility for the remaining ten percent.

2. Formula Two: Contribution

After the response action is completed, all PRP's who were not named as defendants, or who were held jointly and severally liable, and all unadjusted volume share PRP's who elect to join the contribution action, would be subject to contribution. Allocation of liability in the contribution action would be premised on a different formula than volume share. The contribution formula would take into account all of the factors relevant to the hazards of the site, such as mobility, toxicity, and method of disposal. Because the contribution formula need not serve as the inducement for settlement, it could take all these factors into account without diminishing the incentives for private action.

In addition to considering all the factors relevant to a hazardous waste site, the contribution formula also would have to make two other adjustments to the unadjusted volume shares of PRP's. The first adjustment would compensate for the problem of excess coverage. Equating the total percentage of volume shares represented in the contribution suit to 100% and then assigning relative shares of liability on the same proportion would be the simplest and fairest method of making this adjustment. The second adjustment would account for the fact that the entire dollar amount of the plaintiff's judgment may not be represented in the contribution action. If the plaintiffs in the contribution action together have satisfied only eighty percent of the total cleanup cost, the adjusted volume shares of each of the contribution defendants would

177. In most cases in which EPA is the plaintiff, it should be able to avoid participating in contribution actions by turning over its evidence to the court.

178. For example, if all the parties to the contribution action represent a total of 150% in unadjusted volume shares, the court should adjust each defendant's share by the ratio of the total waste at the site (100%) to the total unadjusted volume shares represented in the action (150%). In this example, each PRP's share of the responsibility initially will be two-thirds (100/150) of his unadjusted volume share. In other words, a party with an unadjusted volume share of 12% will have its share adjusted downward to 8%.
have to be calculated on that lesser amount. Since defendants who have paid their full volume share, either through settlement or litigation, could elect not to participate in the contribution action, the entire amount of the cleanup costs would not be subject to contribution.\footnote{179}

\section*{B. Analysis of the Allocation Scheme}

This two-formula, two-stage allocation is intended to create an effective "carrot and stick" liability allocation scheme. It is based on the belief that an optimum mix of incentives and disincentives in the substantive law would provide more encouragement to negotiate than does the current settlement policy. The proposal also reflects a belief that the defendants are not the only parties who need to be encouraged to negotiate. Accordingly, this allocation scheme contains incentives and disincentives for both the government and the PRP's.

For the government, the major incentive is the opportunity to assess liability solely on the basis of unadjusted volume contributions. Because of the potential for excess coverage,\footnote{180} this method of allocation provides a modified form of joint and several liability. Further, even though EPA will bear the burden of establishing relative volume contributions, placing the initial burden of apportionment—and the corresponding risk of shortfall—on the government makes sense from both a theoretical and practical point of view. EPA is not the type of plaintiff for whom common law courts shifted the burden of proof and loss to the wrongdoing defendants.\footnote{181} By virtue of its information-gathering powers\footnote{182} and the Superfund,\footnote{183} the government is in a much stronger position to prove

\footnote{179. For example, if the total cleanup cost is $1 million, but defendants who have paid $200,000 of those costs elect not to participate in the contribution action, only $800,000 remains to be allocated in that action. Thus the defendant whose 12% share initially was adjusted down to 8% would incur a liability of 8% of $800,000 or $64,000.}

\footnote{180. See infra note 188.}

\footnote{181. F. Anderson, supra note 65, at 14, 15.}

\footnote{182. CERCLA provides EPA with powerful information-gathering authority. Section 103(c) initially requires all owners, operators, transporters, and arrangers to notify EPA of the existence of hazardous waste sites with which they are associated and the "amount and type of any hazardous substance to be found there." The penalties for failure to notify EPA include criminal sanctions, loss of liability limitation protections, and loss of section 107(b) defenses. CERCLA § 103(c), 42 U.S.C. § 9603(c) (1982).

Section 104(b) authorizes the President to "undertake such investigations, monitoring, surveys, testing, and other information gathering as he may deem necessary or appropriate" to respond to a release or threatened release of hazardous substances. See id. § 104(b), 42 U.S.C. § 9604(b) (amended 1986). Likewise, section 104(e) grants the government extraordinarily broad access to hazardous waste sites and to the records pertaining to hazardous waste for purposes of inspection, sampling, and copying. Id. § 104(e), 42 U.S.C.A. § 9604(e) (West Supp. 1987).

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\footnote{183. Congress authorized a total of $1.6 billion spread over five years for the original Hazardous Substance Response Trust Fund (Superfund). CERCLA § 131, 42 U.S.C. § 9631 (1982). SARA increased this amount fivefold to $8.5 billion. SARA § 111(a), 42 U.S.C.A. § 9611(a) (West Supp. 1987).}
relative volume shares and to bear the financial risk of failure to prove those shares.\textsuperscript{184}

Failure to make that proof will result in the imposition of joint and several liability. In order to discourage EPA from intentionally failing to prove volume contributions, the PRP's are given the chance to prove their relative contributions, and the government's recovery through joint and several liability is limited to fifty percent of the total response costs.

The proposed scheme encourages PRP's to settle in two ways: (1) it provides a simple and explicit formula upon which liability can be forecast, and (2) it provides PRP's with the opportunity to be released from all future liability for response actions at the site and to receive immunity from contribution claims. The scheme, nevertheless, is not overly favorable to the PRP's. It requires them to pay a premium to take advantage of these two incentives by ensuring that they either will satisfy their liability on the basis of unadjusted volume share or will be jointly and severally liable for fifty percent of the total response costs. Any adjustment of their ultimate liability must wait until after the response action is complete.\textsuperscript{185}

There are two reasons why the volume of waste attributable to a PRP should be used as the basis for an initial allocation of responsibility.

\textsuperscript{184} EPA has been reluctant to use the Superfund to pay for a portion of the costs in the context of a negotiated cleanup. Its policy has been to use the Superfund for direct cleanup and then either to seek reimbursement through section 107 of CERCLA or to require the PRP's to foot the entire bill for a negotiated cleanup. \textit{See} Anderson, \textit{supra} note 6, at 298-304.

There are several reasons for EPA's reluctance. First, the experience of EPA during the reign of Ann Gorsuch and Rita Lavelle made both agency and congressional officials leery of negotiated settlements in general. \textit{Id.} at 279-83. Second, EPA may want to conserve the Superfund for use at "orphan" sites. Since the majority of the revenue for the Superfund is generated by a tax on chemical and petroleum feedstocks and imported crude oil, however, the "taxpayers" are, to a very large extent, also the most financially sound PRP's. As a matter of equity, it makes no sense to argue that use of the Superfund for a portion of the cleanup costs at sites with solvent PRP's relieves the responsible parties of a portion of their liability. They are still paying for a portion of their actions through the Superfund taxes. Taken in this light, the only legitimate reason for not using the Superfund at sites with solvent PRP's is to conserve the fund for orphan sites. Hard and fast adherence to this policy, however, may result in a less than optimum program for meeting the goals of CERCLA. Use of the Superfund to pay a limited portion of the cleanup costs at sites with solvent PRP's will actually induce negotiated cleanups and thus will speed the overall cleanup and cost recovery program. For an excellent critique of EPA settlement policy in general, see \textit{id.} at 297-306.

\textsuperscript{185} The primary difference between this scheme and EPA's current settlement policy is that it provides the PRP's with a definitive alternative to joint and several liability, i.e., volume share liability. EPA currently holds out the threat of joint and several liability as an inducement to settlement, but the agency refuses to accept any settlement offer that does not equal a very large proportion of the total cleanup costs. Anderson, \textit{supra} note 6, at 298. Unless the defendants that EPA initially has targeted for suits can convince a large majority of the remaining PRP's to join in the settlement offer, those initial defendants will be required to offer an amount substantially in excess of their true proportionate responsibility in order to settle the case. These defendants, therefore, have little to gain by settling, aside from avoiding litigation costs.
First, evidence of volume is usually easily obtained and simple to work with when assigning percentages of responsibility. Second, volume of waste is the one factor most consistent with CERCLA's basic premise: anyone who contributed to the condition of a site in any manner is liable for the costs of cleaning up the site. The common element among all PRP's made liable under section 107 is that they are responsible for the presence of hazardous waste at the site in question. It follows that each party's degree of responsibility for the presence of hazardous waste at the site should determine the extent to which each PRP ultimately is responsible for cleanup costs.

The proposed liability allocation scheme has two controversial features. First, apportioning liability among defendants solely on the basis of unadjusted volume shares has the potential to yield total liability substantially in excess of 100%. As a result, a PRP's proportionate share of the liability may be significantly greater than it would be if liability shares were calculated according to the number of PRP's actually responsible for the condition of the site.

The inequities posed by this overlap are not so severe that they overcome the benefits of relying on volume shares. First, much of the waste at a specific site may not be assignable to all classes of defendants, thus eliminating some potential for excess coverage. Second, financial recovery from all potential defendants is unlikely because some PRP's may have gone out of business or otherwise may have become judgment proof.

The second controversial attribute of this liability allocation formula is that the granting of releases from liability for future response costs could create a substantial drain on the Superfund in the years to come. 

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186. Considering such factors as the strength of the evidence linking the waste to a PRP, the manner in which the PRP handled his waste, or the precedential value of a particular settlement offer, necessarily involves the exercise of individual judgment. Further, determining the mobility and toxicity of a particular PRP's waste after it has been intermingled with other wastes at the site can be very speculative. Ultimately, determining a PRP's relative volume contribution depends upon the availability of adequate evidence. Where that evidence exists, there should be little disagreement over the amount of waste for which a PRP is responsible.

187. For an excellent discussion of how CERCLA imposes liability for a condition, as opposed to liability for ultrahazardous or abnormally dangerous activities, see F. Anderson, supra note 65, at 2-7.

188. In the ideal situation without duplication of parties, all of the waste could be assigned to three different parties—owner, generator, and transporter—yielding volume shares totalling 300%. See CERCLA § 107(a), 42 U.S.C.A. § 9607(a) (West Supp. 1987). It will be necessary for an adjustment to be made to reflect this excess coverage. For a description of the adjustment mechanism in the contribution formula, see supra note 178 and accompanying text.

189. This fear of future response costs has been a primary factor in EPA's unwillingness to grant full and complete releases to PRP's who have satisfied initial cleanup costs. See Anderson, supra note 6, at 293-94. The possibility of future response costs arises out of the physical nature of hazardous wastes and the situation found at most hazardous waste dump sites. At many sites, cleanup consists of stabilization of the site through measures designed to prevent further releases into the environment. Regardless of how extensive and expensive such measures might be, no system can guarantee that releases will not occur for the duration toxicity of
Nevertheless, PRP's must be provided an incentive to pay on the basis of the unadjusted volume share. The best incentive is to release them from all future liability for response actions at the site and to grant them immunity from contribution actions.

The difficulties associated with these two features are lessened because they complement each other in a way that minimizes the potential for inequitable results. The excess coverage characteristic of unadjusted volume share liability will reduce the number of defendants opting for release, because eligibility requires a defendant to settle based on unadjusted volume share and to waive any right to seek contribution. To some defendants, the release will not be worth this burden. These defendants will resist the plaintiff's efforts to establish their liability by volume share. If the defendants are successful, they will avoid payment based on unadjusted volume share, but will not be eligible for a release. Even if the defendants are unsuccessful, they still may avoid paying based on unadjusted volume share if they recover in a contribution action. As a prerequisite to seeking contribution, however, a PRP must waive eligibility for a release. Thus, defendants have a clear choice: pay on the basis of unadjusted volume share and obtain a release from future liability, or submit to joint and several liability, contribution liability, and liability for future response costs.

In addition, the conditions at a particular site may make the likelihood of future response actions greater. In such cases, PRP's may offer to settle on the basis of unadjusted volume shares in order to qualify for a release from future liability. Full settlement creates the possibility that the site may become an "orphan" in terms of future response actions. To avoid this situation, EPA could accept settlement offers of unadjusted volume shares on a first come, first served basis until 100% of the cleanup cost is recovered. At that point all remaining defendants would be foreclosed from eligibility for a release and thus subject to liability for future releases. 190

The objective of this proposed liability allocation formula is to encourage negotiated cleanups by offering a "carrot and stick" to the PRP's and to the government. The "carrot" to PRP's is a permanent release

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the waste. As such, there always will be the threat of a release at some time in the future, which will necessitate the expenditure of response funds. Even if the wastes are physically removed from the sites and incinerated, they may have so permeated the surrounding environment that complete removal of all toxics is impossible. Migration of these toxics through the earth to a drinking water supply also poses a distinct possibility of future response costs. 190. It is conceivable that, rather than prevent willing PRP's from paying their unadjusted volume share after 100% of the response costs have been recovered, the government could continue to collect those shares, thus making the PRP's eligible for releases. The effect of such action would be to permit PRP's to buy releases from future liability with payment of their unadjusted volume share of today's response costs. This money could then be deposited into the Superfund to be banked for future response costs.
from future liability. The "stick" is joint and several liability, contribution liability, and liability for future response actions at the site. For the government, the ability to collect response costs on the basis of unadjusted volume shares serves as the "carrot." The fifty percent limitation on joint and several liability is the "stick." If applied as outlined above, these "carrot and stick" measures should provide the inducement necessary to convince all parties that negotiated cleanups are in their best interests.

CONCLUSION

Hazardous waste disposal sites pose a serious threat to human health and the environment in this country. Minimizing that threat will require an effort of monumental proportions.

Congress developed a broad outline for cleaning up hazardous waste sites by enacting CERCLA. An essential premise of that outline is that the parties who profited from the generation, transportation, and disposal of hazardous waste shall be responsible for the cost of cleaning up that waste. Congress, however, has been unable or unwilling to decide how those parties are to divide such costs among themselves. EPA's efforts to fill that void have been ineffective. As a result, very few hazardous waste sites have been cleaned up since CERCLA was enacted.

If credible progress is to be made in our efforts to clean up the thousands of hazardous waste sites in this country, the private parties liable under CERCLA must be encouraged to enter into agreements for such cleanups. The success of that effort will be determined to a significant degree by the manner in which the enormous financial responsibility for those cleanups is allocated among those parties.

Congress must revisit the issue of liability allocation and craft a scheme that is designed primarily to encourage private party action. In devising a scheme, Congress should draw upon the liability concepts developed over centuries of evolving tort law and use those concepts that best promote the goal of quickly and efficiently cleaning up the greatest number of the nation's hazardous waste sites.

The two critical components of a liability allocation scheme are: (1) liability for cleanup costs premised solely upon the volume of waste for which the defendant is responsible, and (2) the availability of releases from future liability. When employed together, these two components will provide the incentives and predictability necessary to encourage negotiated cleanups. The cooperative effort represented by such negotiations is our best opportunity to meet the objectives of CERCLA.