COMMENTS

DO REMOVAL CREDITS DESERVE CREDIT? AN ANALYSIS OF POTWS AND THE CWA REMOVAL CREDIT PROGRAM

I. INTRODUCTION

The removal credit program of the Clean Water Act[1] (CWA or Act) focuses on the relationship between publicly owned treatment works (POTWs), facilities which treat municipal sewage and industrial waste water, and indirect dischargers, industries which discharge toxic pollutants into the POTWs.[2] The removal credit program allows a POTW to relax the pretreatment requirements for indirect dischargers when the POTW's treatment program adequately removes industrial pollutants. Congress implemented the removal credit program for the benefit of both industrial dischargers and the environment.[3] As conceived, both industries and municipalities would contribute funds to operate and maintain local POTWs in order to receive quality sewage treatment at a cost lower than that of separate treatment.[4]

From its inception, the removal credit program has been criticized and plagued with problems.[5] In fact, the program is not currently in use anywhere in the United States.[6]

Unlike general successful environmental programs, the removal credit program fails to provide adequate economic incentives to industry. In the past twenty years policymakers have begun to embrace the idea that market concepts and economics can be useful in combating,

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1. 33 U.S.C. §§ 1251-1387 (1988).

2. *See* Clean Water Act of 1977, Pub. L. No. 95-217, sec. 54(a), § 307(b)(1), 91 Stat. 1566, 1591 (1977) (codified at 33 U.S.C. § 1317(b)(1) (1988)).

3. *See* Cerro Copper Prods. Co. v. Ruckelshaus, 766 F. 2d 1060, 1067 (7th Cir. 1985) (citing SENATE COMM. ON ENV'T AND PUBLIC WORKS, 95TH CONG., 2D SESS., LEGISLATIVE HISTORY OF THE CLEAN WATER ACT OF 1977, 343 (Comm. Print 1978)).

4. *Id.*

5. *See infra* notes 133-152 and accompanying text.

6. Telephone Interview with Mark Charles, Environmental Protection Agency, Enforcement Division, Office of Water (Jan. 28, 1994). When the program was suspended in 1986, there were twelve POTWs that implemented the removal credit program. ENVIRONMENTAL PROTECTION AGENCY, NATIONAL PRETREATMENT PROGRAM REPORT TO CONGRESS, ES-7, (1991) [hereinafter EPA PRETREATMENT REPORT]. Since the program has been re-established in 1991, only one POTW has applied for the authority to grant removal credits. Telephone Interview with Mark Charles, *supra.* So the reimplementation of the program has not sparked much interest among POTWs and has not affected industrial compliance. *Id.* Removal credits remain "theoretically available" but whether they will ever be effectively implemented has yet to be seen. Telephone Interview with David Sandalow, Environmental Protection Agency, Office of General Counsel, Office of Water (Feb. 8, 1994).

controlling and eliminating environmental pollution.[7] Market-based, economically sensitive regulations are surfacing everywhere, including tradable emissions permits in air quality regulations,[8] point-nonpoint source trading in water quality control[9] and the removal credit idea itself.[10] Despite its recent acceptance, the market-based approach is not a new idea.[11]

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7. *See* Marshall J. Breger et al., *Providing Economic Incentives in Environmental Regulation,* 8 YALE J. ON REG. 463, 464-65 (1991); Robert W. Hahn & Robert N. Stavins, *Incentive-Based Environmental Regulation: A New Era from an Old Idea?,* 18 ECOLOGY L.Q. 1, 3 (1991).

8. *See* Clean Air Act, 42 U.S.C. § 7503(c) (Supp. IV 1992); *see also* Emissions Trading Policy Statement: General Principles for Creation, Banking and Use of Emission Reduction Credits, 51 Fed. Reg. 43,814 (1986). Emission Reduction Credits (ERCs) are the key element to the trading program. If a facility emits fewer pollutants than the maximum level allowed, the facility can use, trade or sell the additional amount that it can lawfully pollute. ERCs may be created by reductions from either stationary, area, or mobile sources and only those reductions which are surplus, enforceable, permanent and quantifiable can qualify as ERCs. 51 Fed. Reg. 43,814 at 43,829 (1986).

9. *See generally* Esther Bartfeld, *Point-Nonpoint Source Trading: Looking Beyond Potential Cost Savings,* 23 ENVTL. L. 43 (1993). *See infra* note 183 and accompanying text. Although there is no clear statutory authority to implement point-nonpoint source trading, municipalities have experimented with the idea to control nutrient problems within a watershed and to meet the water quality standards detailed in the Clean Water Act. Bartfeld, at 46. CWA sections 302 (water quality related effluent limitations, 33 U.S.C. § 1312) and 303 (water quality standards and implementation plans, 33 U.S.C. § 1313) seem to authorize the point-nonpoint source trading program. *Id.* at 71-72. The program has been best demonstrated in the Dillon Reservoir Project in Colorado. *See id.* at 83-85. *See also* Hahn & Stavins, *supra* note 7, at 18; 57 Fed. Reg. 11,312 (1992).

10. Clean Water Act of 1977, Pub. L. No. 95-217, sec. 54(a), § 307(b)(1), 91 Stat. 1566, 1591 (1977) (codified at 33 U.S.C. § 1317(b)(1) (1988)).

11. John H. Dales was one of the earliest advocates of incorporating economic incentives into environmental regulations. *See generally* JOHN H. DALES, POLLUTION, PROPERTY & PRICES (1968).

> We all know that pollution can't be wished away, and that waste disposal costs are as inevitable as death and taxes. We must bear these costs in one of three forms: treating wastes to reduce their noxious effects *before* we release them into the environment; avoiding their noxious effects *after* they have been released into the environment; or simply *suffering* their noxious effects after they have been released into the environment. The economist, from his Olympian heights, says that what we should do, obviously, is to allocate costs between pollution prevention, damage avoidance, and welfare damage in such a way as to minimize the social costs . . . .

Id. at 104 (emphasis in original).

Evaluation of traditional command-and-control regulations[12] shows that conventional approaches are neither cost-effective nor flexible enough to further combat environmental pollution.[13] As a result of the failure of the conventional command-and-control approach, regulators turned to alternative methods in an attempt to find a better way to protect the environment.[14] The market-based approach is one such method. There was originally some degree of intellectual and ideological opposition to the use of market-incentives. Many people now realize, however, that environmental protection cannot be pursued regardless of cost and that the environment cannot be saved if its protectors vehemently adhere to the moral high ground.[15]

Environmental protection can benefit from the incorporation of economics into various regulatory schemes. The most effective solution may be a combination of command-and-control regulations with economic incentives. However, there are limitations on the use of market incentive programs.[16] Sometimes economic solutions, although seemingly sound, fail to work within the existing regulatory scheme.

The removal credit provision may be such a failed economic program. When Congress reconsiders CWA it must decide whether the removal credit program provides an economically beneficial scheme for the regulation of indirect dischargers[17] or whether it is so ridden with

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12. Command-and-control regulations are those that impose specific, uniform controls, usually reflecting stated performance or technological standards such as "best available technology." *See, e.g.,* 33 U.S.C. § 1311(b)(2)(A) (1988).

13. *See* Hahn & Stavins, *supra* note 7, at 5-6. *See also* Breger et al., *supra* note 7, at 465.

14. The Clean Water Act departed from traditional water quality standards to embrace the permit system and technology forcing standards found in the 1977 Amendments. *See generally* Clean Water Act of 1977, Pub. L. No. 95-217, 91 Stat. 1566 (1977) (codified at 33 U.S.C. §§ 1251-1387 (1988)).

15. *See* WILLIAM J. BAUMOL & WALLACE E. OATES, ECONOMICS, ENVIRONMENTAL POLICY AND THE QUALITY OF LIFE 245 (1979) ("Society has been giving away free too many of its precious resources far too long. It is *not* scandalous to decide that everything has its price; the real scandal lies in setting that price at zero or at some token level that invites us all to destroy these resources . . . . Unless we recognize the legitimate role of price incentives for the control of pollution, we may end up with our sense of morality intact but our environment the worse for continued abuse." (emphasis in original)).

16. *See* Breger et al., *supra* note 7, at 475-76; *see also* Wallace Oates et al., *The Net Benefits of Incentive-Based Regulation: A Case Study of Environmental Standard Setting,* 79 AM. ECON. REV. 1233, 1240-42 (1989); James T.B. Tripp & Daniel J. Dudek, *Institutional Guidelines for Designing Successful Transferable Rights Programs,* 6 YALE J. ON REG. 369, 370-71 (1989).

17. Indirect dischargers are point sources which discharge their pollutants not directly into navigable waters, but into POTWs. *See* 33 U.S.C. § 1317 (1988).

deficiencies and limitations that it neither makes sense economically nor environmentally.

The removal credit program was established to both reduce the cost of treatment and to avoid duplicative waste treatment. In essence the removal credit program relaxes indirect dischargers' pretreatment programs as long as the POTW can adequately remove the pollutants within the waste stream. As such, the removal credit program is aimed at economic efficiency. The goal of economic efficiency fails when treatment standards are not stringent enough to protect human health and the environment or when POTWs are unable to adequately remove the pollutants for which removal credits were granted.

It is in industry's best interest to insure that POTWs adequately function. Industry is allowed to relax their pretreatment only if they can rely on the performance of the POTW. As the removal credit program exists, industry cannot insure that POTW's function properly. Furthermore, one industrial discharge will not contribute to a POTW because this contribution would work to the advantage of all industries. In other words, while there might be an incentive for one industrial discharger to help the POTW function adequately (so that this discharger can eventually receive removal credits and be exempted from some costly pretreatment) one discharger would not do so if other industrial dischargers could reap the benefits of its action. Industrial discharges will not contribute to a POTW unless Congress or the EPA mandates them to jointly contribute. This comment addresses these issues by examining the removal credit program from its inception, analyzing the objectives and intent of the program, and arguing that it is a failed program. Part II provides an overview to the statutory history of the removal credit program. Part III chronicles court challenges of the program and reviews statutory and regulatory responses to these challenges. Part IV discusses the implementation of the program from its inception to its current and future status, focusing on the problems that have plagued the program. Part V describes the change in environmental regulations from the traditional command-and-control approach to economic-based incentives, and suggests that the removal credit program might be more effective if it were implemented through some type of economic incentive. Finally, Part VI proposes alternative approaches to the removal credit program which incorporate economic incentives into the command-and-control regulation that governs the removal credit program.

II. THE STATUTORY HISTORY OF THE REMOVAL CREDIT PROGRAM

A. The Statute

Congress established the removal credit program as part of the regulatory framework of the CWA. The national goal of the Act is to eliminate the discharge of pollutants into navigable waters in order to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[18] To reach this objective, the Act directs the Administrator of the Environmental Protection Agency (EPA) to promulgate regulations limiting effluent discharges of three types of point sources.[19] The EPA was to establish effluent limits for: (1) direct dischargers, point sources that discharge directly into navigable waters,[20] (2) publicly owned treatment works (POTWs),[21] and (3) indirect dischargers,[22] point sources that discharge pollutants into POTWs.

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18. 33 U.S.C. § 1251(a) (1988).

19. A point source is defined as

> any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

Id. § 1362(14). A nonpoint source is by implication any conveyance which is not covered in § 1362(14) such as runoff caused primarily by rainfall around activities that use or cause pollutants.

20. *Id.* §§ 1311(b)(1)(A), 1314(b)(1).

21. The term "treatment works" is defined as

> any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature to implement section 1281 of this title, or necessary to recycle or reuse water at the most economical cost over the estimated life of the works, including intercepting sewers, outfall sewers, sewage collection systems, pumping, power, and other equipment, and their appurtenances; extensions, improvements, remodeling, additions, and alterations thereof; elements essential to provide a reliable recycled supply such as standby treatment units and clear well facilities; and any works, including site acquisition of the land that will be an integral part of the treatment process . . . or is used for ultimate disposal of residues resulting from such treatment.

Id. § 1292(2)(A). Additionally "treatment works" means "any other method or system for preventing, abating, reducing, storing, treating, separating, or disposing of municipal waste, including storm water runoff, or industrial waste, including waste in combined storm water and sanitary sewage systems." *Id.* § 1292(2)(B).

22. *See id.* § 1317(b)(1).

The removal credit program is part of the General Pretreatment Program which establishes categorical pretreatment standards.[23] The EPA first implemented the removal credit program in 1973[24] which later provided a framework for the 1978 version of the program.[25] While there have been subsequent versions of the removal credit program, the 1977 version provides the basic structure of the program.

EPA defined "removal" as:

> a reduction in the amount of a pollutant in the POTW's effluent or alteration of the nature of a pollutant during treatment at the POTW. The reduction or alteration can be obtained by physical, chemical or biological means and may be the result of specifically designed POTW capabilities or may be incidental to the operation of the treatment system. Removal . . . [does] not mean dilution of a pollutant in the POTW.[26]

The Act mandates that the EPA establish national pretreatment standards for indirect discharges using the POTWs because the POTWs' secondary treatment cannot sufficiently eliminate toxic pollutants from the waste stream.[27]

Congress added the removal credit program to the Federal Water Pollution Control Act (FWPCA)[28] when it enacted the Clean Water Act of 1977.[29] The program responded to a growing concern about toxic

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23. *See* 40 C.F.R. § 403.7 (d)(2) (1993).

24. Pretreatment Standards, 38 Fed. Reg. 30,982 (1973). *See also* Clean Water Act Amendments of 1972, Pub. L. No. 92-500, § 2, 86 Stat. 816, 1001-02 (1972) (codified at 33 U.S.C. § 1317(b)(1) (1988)) (marking the change in water pollution control laws from water quality standards to effluent limits, thus permitting implementation of removal credit program).

25. General Pretreatment Regulations, 43 Fed. Reg. 27,736 (1978); Clean Water Act, § 307(b)(1), Pub. L. No. 95-217, 91 Stat. 1566 (1977) (codified at 33 U.S.C. § 1317(b)(1) (1982)). The 1977 Act increased and strengthened federal control over toxic pollutants and amended the removal credit program by mandating that credits could not be granted if they would lead towards sludge contamination. *See* Natural Resources Defense Council, Inc. v. EPA, 790 F.2d 289, 293-94 (3d Cir. 1986), *cert. denied sub nom.* Chemical Mfrs. Ass'n v. Natural Resources Defense Council, Inc., 479 U.S. 1084 (1987).

26. 40 C.F.R. § 403.7(a)(1)(i) (1993).

27. *See* 33 U.S.C. § 1317(b)(1) (1988). There are three levels of pretreatment. Primary treatment refers to a sedimentation process which removes settled solids. Secondary treatment refers to a process which removes pollutants characterized by pH and biological oxygen demand. Tertiary treatment refers to a process which removes other nonbiodegradable pollutants. *Natural Resources Defense Council*, 790 F.2d at 293 n.2.

28. 33 U.S.C. §§ 1251-1387 (1988).

29. Clean Water Act of 1977, 33 U.S.C. § 1317(b)(1) (1988).

pollution and the inadequacies of existing legislation in combating this problem.[30] Under the program, the POTW may grant removal credits to the indirect discharger for the amount of toxic material the POTW is capable of removing from the indirect dischargers' waste stream.[31] This program addresses congressional concern about toxic pollutants by strictly regulating the instances in which a POTW may grant removal credits. The program allows indirect dischargers to discharge greater amounts of toxic pollutants as long as the POTW can adequately and consistently treat the additional amount of pollution.[32] The combination of treatment from the industrial discharger and the POTW must achieve "at least that level of treatment which would be required if the industrial source were making a direct discharge."[33] The program sets conditions

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30. *See* 123 CONG. REC. 38,959-60 (1977); *see also* SENATE COMM. ON ENVIRONMENT AND PUBLIC WORKS, 95TH CONG., 2D SESS., A LEGISLATIVE HISTORY OF THE CLEAN WATER ACT OF 1977, 326-27, 454-55, 862-65 (Comm. Print 1978).

> The highlight of this bill—the most important and far-reaching amendments are contained in a package of provisions responding to the most critical deficiencies in Public Law 92-500, dealing with toxic pollutants and the 1983 requirements in the act for treatment of industrial discharges.
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> Basically, the problems are diametrically opposed in nature: Underregulation, or the lack of ability to regulate rationally in the case of toxic pollutants, and overregulation in terms of excessive and burdensome regulation in the case of conventional pollutants at costs not even remotely commensurate with environmental benefits in terms of water quality.

123 CONG. REC. 38,959-60 (1977) (Statement of Senator Muskie) Senator Muskie noted that control of toxic pollutants under the 1972 Amendments "[frankly] . . . has failed." *Id.* at 38,960.

31. *See* 33 U.S.C. § 1317(b)(1).

32. 40 C.F.R. § 403.7(a), (b). The statutory language for the removal credit program provides:

> If, in the case of any toxic pollutant under subsection (a) of this section introduced by a source into a publicly owned treatment works, the treatment by such works removes all or any part of such toxic pollutant and the discharge from such works does not violate that effluent limitation or standard which would be applicable to such toxic pollutant if it were discharged by such source other than through a publicly owned treatment works, and does not prevent sludge use or disposal by such works in accordance with section 405 of this Act, then the pretreatment requirements for the sources actually discharging such toxic pollutants into such publicly owned treatment works may be revised by the owner or operator of such works to reflect the removal of such toxic pollutant by such works.

33 U.S.C. § 1317(b)(1) (1988).

33. H.R. CONF. REP. NO. 830, 95th Cong., 1st Sess. 87 (1977), *reprinted in* 1977 U.S.C.C.A.N. 4424, 4462. The POTW can only grant removal credits when: (1) the POTW applies and receives authorization from the Approval Authority to grant removal credits; (2) the POTW demonstrates consistent removal; (3) the POTW already operates under an approved

on a POTW's authority to relax the pretreatment program otherwise applicable to an industrial discharger when the POTW's own treatment program removes all or part of the pollutant in question.[34] In essence, the removal credit program seeks to avoid redundant treatment, or "treatment for treatment's sake"[35] as well as to create a more efficient waste treatment program.

B. The Regulations

The FWPCA reflects congressional concern that the regulation of direct dischargers would not be sufficient to achieve the Act's goal of restoring and maintaining the quality of the Nation's waters. The cause of this concern is the vast number of industries that discharge indirectly into POTWs.[36] Indirect discharges pose a substantial environmental threat since the discharge, often composed of toxic pollutants,[37] mixes with domestic wastes[38] and municipal runoff[39] and enters the POTW. The POTWs are often inadequately equipped to handle the industrial

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pretreatment program; (4) the issuance of removal credits does not cause the POTW to violate sludge requirements; and (5) the granting of credits will not cause the POTW to violate its National Pollutant Discharge Elimination System (NPDES) permit. 40 C.F.R. § 403.7(a)(3) (1993).

34. *See id.*

35. 123 CONG. REC. 38,966 (1977); SENATE COMM. ON ENVIRONMENT AND PUBLIC WORKS, 95TH CONG., 2D SESS., A LEGISLATIVE HISTORY OF THE CLEAN WATER ACT OF 1977, 343 (Comm. Print 1978).

36. *See* Natural Resources Defense Council, Inc. v. EPA, 790 F.2d 284, 293 (3d Cir. 1986) (citing 33 U.S.C. § 1317(b)(1); SENATE COMM. ON ENVIRONMENT AND PUBLIC WORKS, 95TH CONG., 2D SESS., A LEGISLATIVE HISTORY OF THE CLEAN WATER ACT OF 1977, 326-27, 454-55, 862-65 (Comm. Print 1978)), *cert. denied sub nom.* Chemical Mfrs. Ass'n v. Natural Resources Defense Council, Inc., 479 U.S. 1084 (1987).

37. "Toxic pollutant" means:

> those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions . . . or physical deformations, in such organisms or their offspring.

33 U.S.C. § 1362(13). Examples of toxic metals are lead, copper, zinc, mercury and nickel. Tod A. Gold, *EPA's Pretreatment Program,* 16 B.C. ENVTL. AFF. L. REV. 459, 460 n.1 (1989). Examples of toxic organics are benzene and trichloroethylene. *Id.*

38. In the context of the Solid Waste Disposal Act, "Domestic sewage" is untreated sanitary wastes that pass through a sewer system. 40 C.F.R. § 261.4(a)(1)(ii) (1992).

39. Although used frequently, municipal runoff is not defined by statute or regulation.

discharge in addition to the domestic and municipal waste streams.[40] As a result, the introduction of toxic pollutants from the industrial waste streams may interfere with, or "pass through," the POTW's function.[41] The interference may cause the waste to either enter navigable waters without sufficient treatment or to contaminate the POTW sludge and cause problems with its disposal.[42]

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40. The regulations appear to use "municipal runoff" in its common sense meaning. *See* Gold, *supra* note 37, at 462-64. Generally, POTWs are equipped to remove conventional pollutants such as biochemical oxygen demand, total suspended solids, pH, fecal coliform, and oil and grease. *Id.* at 462 n.12 (citing 40 C.F.R. § 401.16 (1993) (list of conventional pollutants)). Toxic pollutants require different treatment from conventional pollutants, and therefore, most POTWs are not equipped to adequately treat toxic wastestreams. *Id.* at 462.

41. EPA defines "interference" as:

> a Discharge which, alone or in conjunction with a discharge or discharges from other sources, both:
> (1) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
> (2) Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act . . ., the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

40 C.F.R. § 403.3(i) (1993). In addition, the introduction of the following pollutants into POTWs are prohibited because of their potential to interfere with the workings of the POTWs:

> (1) Pollutants which create a fire or explosion hazard in the POTW . . .[,]
> (2) Pollutants which will cause corrosive structural damage to the POTW . . .[,]
> (3) Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW . . .[,]
> (4) Any pollutant . . . which will cause Interference with the POTW[,]
> (5) Heat in amounts which will inhibit biological activity in the POTW resulting in Interference . . .[,]
> (6) Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
> (7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems . . . .

Id. § 403.5(b).

42. Sludge is the solid by-product of sewage treatment. It is a concentration of "[v]irtually all of the toxics that do not pass untreated through the POTW . . . . The 'removal' of non-biodegradable toxics, such as metals, from the wastes that flow into the POTW transfers these toxics from the POTW's liquid wastestream to the POTW's solid waste." Natural Resources Defense Council, Inc. v. EPA, 790 F.2d 289, 311 n.2 (3d Cir. 1986), *cert. denied sub nom.* Chicago Ass'n of Commerce & Indus. v. Natural Resources Defense Council, Inc., 479 U.S. 1084 (1987). The contamination of POTW sludge causes many environmental problems. For example, toxic

In response to the concern over indirect discharges, the EPA has implemented two types of pretreatment[43] standards in the General Pretreatment Regulations for Existing and New Sources of Pollution (General Pretreatment Program).[44] First, the prohibitive discharge standard establishes a general prohibition, rather than numerical limits, on any indirect discharge that would "interfere" or "pass through" a POTW.[45] This standard reflects Congress' concern that the pollutants discharged indirectly could either interfere with the operation of the POTW or pass through the POTW's operation and not receive the necessary treatment.[46]

Second, the categorical pretreatment standards establish numerical discharge limits based on categories of industrial sources.[47]

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leachate may contaminate drinking water, and toxics within the sludge may make disposal more expensive and lessen the possibility that the sludge can be used for productive purposes. *Id.* at 311-12. Because of these potential environmental hazards, the Clean Water Act requires that EPA regulate the use and disposal of sludge. *See* 33 U.S.C. § 1345 (1988).

43. EPA defines "pretreatment" as "the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW." 40 C.F.R. § 403.3(q) (1993).

44. 40 C.F.R. § 403 (1993); *see also* 33 U.S.C. § 1317(b)(1) (1988).

45. *See* 43 Fed. Reg. 27,736 at 27,759-60 (1978). For a definition of "interference" *see supra* note 41. "Pass through" is defined as:

> a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation).

40 C.F.R. § 403.3(n) (1993).

46. *See* 33 U.S.C. § 1317(b)(1) (1988) ("Pretreatment standards . . . shall be established to prevent the discharge of any pollutant through [POTWs], which pollutant interferes with, passes through, or otherwise is incompatible with such works.") *See* National Ass'n of Metal Finishers v. EPA, 719 F.2d 624, 641 (3d Cir. 1983) (holding, inter alia, that the definition of "interference" must include a causation requirement), *rev'd on other grounds sub nom.* Chemical Mfrs. Ass'n v. Natural Resources Defense Council, Inc., 470 U.S. 116 (1985). The Administrator redefined "interference" to mean any action which "is a cause of or significantly contributes" to a POTW permit violation. 44 Fed. Reg. 62,260 at 62,265 (1979); 46 Fed. Reg. 9404, 9413 (1981). The 1981 revision defines "significantly contributes" in the context of three numbered categories: (1) discharges in excess of the allowable daily load; (2) discharges wastewater which substantially differs in consistency and nature from the average discharge; and (3) discharging with the knowledge that a POTW violation will occur. 40 C.F.R. § 403.3(i) (1982). *See* Gold, *supra* note 37, at 473-75. Likewise, the term "pass through" has come under considerable scrutiny. *See e.g.*, National Ass'n of Metal Finishers, 719 F.2d at 641 (finding that the term "pass through" was incorrectly promulgated since an opportunity for notice and comment was not provided as required by the Administrative Procedure Act).

47. *See* 43 Fed. Reg. 27,736 at 27,760 (1978).

Categorical pretreatment standards are technology-based standards developed on an industry-to-industry basis.[48] Categorical pretreatment standards do not force industrial sources to use the exact technology used to create the standard.[49] Instead, they require these sources to achieve the effluent limits that such technology has demonstrated to be achievable.[50]

An industrial source can receive removal credits from the POTW only after the POTW revises the indirect discharger's categorical standards to take into account the amount by which the POTW removes pollutants from discharger's waste stream.[51] In revising the categorical standard, the POTW takes into account the amount of toxic pollutants that the POTW can successfully remove and accordingly makes the industrial source's standard less stringent to avoid any unnecessary double treatment.[52] If the POTW can adequately treat part or all of the industrial discharger's pollutants, then, through the removal credit program, the industrial source may be partially relieved of the obligation to pretreat.[53] A POTW planning to revise an industrial source's categorical standards must show that the combined removal by the indirect discharger and the POTW either equals or exceeds the removal achieved by direct dischargers.[54]

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48. Gold, *supra* note 37, at 479 (citing 40 C.F.R. § 403.6). Section 403.6 provides that "[n]ational pretreatment standards specifying quantities or concentrations of pollutants or pollutant properties which may be discharged to a POTW by existing or new industrial users in specific industrial subcategories will be established as separate regulations . . . ." 40 C.F.R. § 403.6 (1987).

49. Gold, *supra* note 37, at 479.

50. *Id.* POTWs must meet effluent limitations defined by the Administrator per section 1314(d)(1). Section 1314(d)(1) requires the Administrator to publish "information, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants, on the degree of effluent reduction attainable through the application of secondary treatment." 33 U.S.C. § 1314(d)(1). These standards differ from best practicable control technology (BPT), 33 U.S.C. § 1311(b)(1)(A), best available technology (BAT), 33 U.S.C. § 1311(b)(2)(A), and best control technology (BCT), 33 U.S.C. § 1311(b)(2)(E).

51. 40 C.F.R. § 403.7(a)(2) (1993).

52. H.R. CONF. REP. NO. 830, 95th Cong., 1st Sess. 87 (1977), *reprinted in* 1977 U.S.C.C.A.N. 4424, 4463.

53. *See* 40 C.F.R. § 403.7(a)(2) (1993).

54. *Id.*; s*ee also* 33 U.S.C. § 1317(b)(1) (1988). The combined treatment must achieve "at least that level of treatment which would be required if the industrial source were making a direct discharge." H.R. CONF. REP. NO. 830, 95th Cong., 1st Sess. 87 (1977), *reprinted in* 1977 U.S.C.C.A.N. 4424, 4462. A direct discharger must comply with the Best Available Technology (BAT) standard. 33 U.S.C. §§ 1311(b)(2)(A), 1314(b)(2)(B). BAT takes into account whether "such elimination is technologically and economically achievable for a category or class of point sources . . . ." *Id.* § 1311(b)(2)(A). BAT also accounts for factors such as "the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-

In addition, before a POTW is able to grant categorical revisions to the discharger's pretreatment standards, reflecting the amount of toxic pollutants it removes, the POTW must meet certain conditions prior to reauthorization.[55] First, the POTW must have an approved pretreatment program permitted under the National Pollutant Discharge Elimination System (NPDES).[56] The Approval Authority must then approve the specific revision.[57] In order to obtain approval for the revision, the POTW must show that it consistently removes a pollutant sufficiently to justify revision of categorical pretreatment standards.[58]

The POTW must also take into account the problems it encounters when there is increased flow due to heavy rainfall or snow. These overflow events are called combined sewer overflows (CSOs).[59]

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water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate." *Id.* § 1314(b)(2)(B).

55. *See* 40 C.F.R. § 403.7(a) (1993).

56. *See* 40 C.F.R. § 403.7(a)(3)(iii) (1993); 33 U.S.C. §§ 1311, 1314(b) (1988). In order for a POTW to revise its NPDES permit, the proposed change must be endorsed by the Approval Authority. The Approval Authority lies with either the head of the state water pollution control agency or the Regional Administrator of the EPA, depending upon whether the state has the authority to administer its own NPDES permit. 40 C.F.R. § 403.3(c) (1993).

57. *See id.* §§ 403.3(c), 403.7(a), (b).

58. *See id.* § 403.7(b). The term "consistent removal" means "the average of the lowest 50 percent of the removal measured according to paragraph (b)(2) . . . ." *Id.* Paragraph (b)(2) sets forth the guidelines for acquiring influent and effluent operational data:

> [a] The data shall be representative of yearly and seasonal conditions to which the POTW is subjected for each pollutant for which a discharge limit revision is proposed. [b] The data shall be representative of the quality and quantity of normal effluent and influent flow . . . . [c] The influent and effluent operational data shall be obtained through 24-hour flow-proportional composite samples. . . . [d] Where composite sam-pling is not an appropriate sampling technique, a grab sample(s) shall be taken . . . . [e] The sampling . . . and an analysis of these samples shall be performed in accordance with the techniques prescribed in 40 CFR part 136 and amendments thereto . . . . [f] All data acquired . . . must be submitted to the Approval Authority . . . .

Id. § 403.7(b)(2)(i)-(vi).

59. CSOs are an area frequently targeted in rule revisions. First, the regulations required corrective action and minimization of bypasses. *See* General Pretreatment Regulations, 43 Fed. Reg. 27,736 at 27,749 (1978). Then, the regulation was amended and the POTW was required to reduce the removal credit based on the frequency of overflow, any additional industrial pretreatment, or industrial suspension of discharge. General Pretreatment Regulations, 46 Fed. Reg. 9404, 9444 (1981). Then, in 1984, CSOs were considered too insignificant to factor into the removal credit formula. General Pretreatment Regulations, 49 Fed. Reg. 31,212 at 31,220 (1984). The 1984 Amendment was invalidated per Natural Resources Defense Council, Inc. v. EPA, 790 F.2d 289, 307-09 (3d Cir. 1986), *cert. denied sub nom.* Chicago Ass'n of Commerce & Indus. v. Natural Resources Defense Council, Inc., 479 U.S. 1084 (1987), and the 1981 rule was reinstated. General Pretreatment Regulations, 52 Fed. Reg. 42,435 (1987).

CSOs pose a substantial problem in the Northeast because most POTWs simply are not equipped to handle the additional flow. Therefore, the POTW must compensate for these overflows and must decrease the removal credit award accordingly. Finally, the POTW must demonstrate that the proposed revision will not impede it from meeting the sludge management requirements.[60]

Once the POTW has authority to revise the discharge limits for specific pollutants, the POTW must monitor itself to ensure that the revision of an indirect discharger's numerical discharge limit has not affected the POTW's capability to remove the pollutant in question.[61] In addition, the POTW must report annually to the Approval Authority and demonstrate that the revision still meets the statutory requirements and that it does not contribute to any POTW violation.[62]

III. CHALLENGES TO THE REMOVAL CREDIT PROGRAM

A. Regulatory History

Since the establishment of the removal credit program, EPA has amended it several times.[63] The rule makings focus primarily on three conditions of the program: (1) that credits will only be granted to POTWs that apply for authority to change industrial categorical standards; (2) that a POTW must demonstrate consistent removal before

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60. 40 C.F.R. § 403.7(a)(3)(iv) (1993). The sludge management requirements detailed within this section control the practices of disposal and use of sludge as well as mandate the establishment of acceptable levels of toxics contained within the sludge.

61. *Id.* § 403.7(f)(3).

> Following authorization to give removal credits, a POTW shall continue to monitor and report on (at such intervals as may be specified by the Approval Authority, but in no case less than once per year) the POTW's removal capabilities. A minimum of one representative sample per month during the reporting period is required, and all sampling data must be included in the POTW's compliance report.

Id.

62. *Id.*

63. Pretreatment Standards, 38 Fed. Reg. 30,983 (1973) (promulgated at 40 C.F.R. § 128); General Pretreatment Regulations, 43 Fed. Reg. 27,736 (1978) (promulgated at 40 C.F.R. § 403, replacing § 128); General Pretreatment Regulations, 46 Fed. Reg. 9404 (1981) (revising §§ 125, 403); General Pretreatment Regulations, 49 Fed. Reg. 31,212 (1984) (revising § 403); General Pretreatment Regulations, 51 Fed. Reg. 20,426 (1986) (revising §§ 122, 403); General Pretreatment Regulations, 52 Fed. Reg. 42,434 (1987) (revising § 403 pursuant to the effect of the judicial remand of the 1984 regulation); Solid Waste Disposal Facility Criteria, 56 Fed. Reg. 50,978 (1991) (revising 40 C.F.R. §§ 257, 258); Standards for the Use or Disposal of Sewage Sludge, 58 Fed. Reg. 9248 (1993) (revising 40 C.F.R. §§ 257, 403, 503).

it can issue removal credits; and (3) that a POTW must comply with sludge disposal requirements before it can obtain any credits.[64] In the past, EPA has frequently revised the definition of "consistent removal" and its policy on the significance of CSO to the removal credit program.[65]

B. Court Challenges

The following court challenges have both strengthened and weakened the removal credit program. Courts have upheld the program as properly within the Agency's authority and have found it to be both workable and viable.[66] Courts have also determined the standard for consistent removal, the necessity to account for CSO, the standard for the withdrawal or modification of credits and the importance of sludge regulations.[67] In addition, the courts have decided whether EPA could take any action on removal credit applications prior to the promulgation of sludge requirements[68] and whether the Agency exceeded its authority by promulgating non-numeric sludge regulations.[69] These issues have shaped the current removal credit program.

1. *National Ass'n of Metal Finishers v. EPA*

By bringing court challenges, various citizen groups and industries made a great impact on the removal credit program. The first

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64. EPA PRETREATMENT REPORT, *supra* note 6, at 5-45.

65. *Id.* EPA's successive regulations redefined "consistent removal" from the removal capability that a POTW achieves in 95% of the representative samples, General Pretreatment Regulations, 43 Fed. Reg. 27,736 at 27,743 (1978), to removal that is achieved in 75% of the samples, General Pretreatment Regulations, 46 Fed. Reg. 9404, 9424 (1981), to removal that is achieved in 50% of the samples, General Pretreatment Regulations, 49 Fed. Reg. 31,212 at 31,215 (1984). The 1984 Amendment was invalidated by Natural Resources Defense Council, Inc. v. EPA, 790 F.2d 289, 305 (3d Cir. 1986), *cert. denied sub nom.* Chicago Ass'n of Commerce & Indus. v. Natural Resources Defense Council, Inc., 479 U.S. 1084 (1987), and the 1981 rule was reinstated. 52 Fed. Reg. 42,435 (1987). *See supra* note 61 for a description of CSO revisions.

66. *See* National Ass'n of Metal Finishers v. EPA, 719 F.2d 624 (3d Cir. 1983), *rev'd on other grounds sub nom.* Chemical Mfrs. Ass'n v. Natural Resources Defense Council, Inc., 470 U.S. 116 (1985).

67. *See* Natural Resources Defense Council, Inc. v. EPA, 790 F.2d 289 (3d Cir. 1986), *cert. denied sub nom.* Chicago Ass'n of Commerce & Indus. v. Natural Resources Defense Council, Inc., 479 U.S. 1084 (1987).

68. *See* Chicago Ass'n of Commerce & Indus. v. Thomas, No. 87-C-6353, 1987 WL 19166 (N.D. Ill. Oct. 28, 1987), *amendment denied by* 1987 WL 28274 (N.D. Ill. Dec. 11, 1987), *aff'd,* 873 F.2d 1025 (7th Cir. 1989).

69. *See* Sierra Club v. EPA, 992 F.2d 337 (D.C. Cir. 1993).

substantial challenge, *National Ass'n of Metal Finishers v. EPA (NAMF),*[70] questioned several substantive provisions of the General Pretreatment Regulation.

a. EPA Authority to Condition the Grant of Removal Credits

The EPA, pursuant to section 307 of the Clean Water Act promulgated general pretreatment regulations and categorical pretreatment standards for existing electroplating sources.

The petitioners argued that EPA lacked the authority to condition the grant of removal credits on the existence of a local pretreatment program.[71] The Third Circuit found no merit to this contention, stating that the Administrator may impose pretreatment requirements prior to the granting of removal credits.[72] Holding that EPA had the authority to place conditions on the removal credit program, the court cited the statement of Senator Muskie:

> Tying local [removal] credits to local compliance programs not only provides an incentive for local participation, but more importantly, it provides assurance that the removal levels which justified the local credits will be maintained by a publicly-owned treatment works committed to a sound pretreatment program.[73]

In other words, POTWs will be more efficient and more effective if there are incentives to create and maintain comprehensive pretreatment programs.

The court concluded its analysis of this issue by stating, "[s]ince such regulations would not deprive POTWs of the sole ability to grant, and the ultimate power to deny, removal credits . . . the Administrator may express the conditions [such as the existence of a local pretreatment

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70. 719 F.2d 624 (3d Cir. 1983).

71. *Id.* at 647-49.

72. *Id.* at 649. The court found that § 501 of the Act gives the Administrator the authority "to prescribe such regulations as are necessary to carry out his function under this chapter." *Id.* (quoting 33 U.S.C. § 1361(a) (1976)). In conjunction with the legislative history, the Third Circuit found that this provision clearly allows the Administrator to impose conditions on the authorization of removal credits. *Id.*

73. *Id.* at 648 (citing H.R. CONF. REP. NO. 830, *reprinted in* 1977 U.S.C.C.A.N. 4424, 4462 (statement of Sen. Muskie)).

program] on his authorization of removal credits in binding regulations."[74]

b. Whether the Removal Credit Program is "Workable"

Based on then existing sections 403.7(f)(5) and 403.7(b)(3) of the General Pretreatment Regulations, the petitioners contended that the removal credit provision was unworkable.[75] Section 403.7(f)(5) allowed the Administrator to modify or withdraw credits if semiannual data showed that the POTW was no longer capable of its predicted removal.[76] Section 403.7(b)(3) mandated that a POTW unable to prevent toxic overflows must reduce the amount of removal credits according to the hours of overflow.[77] Although agreeing that the lack of predictability might cause the POTWs to implement a pretreatment program as if the removal credit provision did not exist,[78] the court nevertheless found, that the Administrator must be able to modify the removal credit according to the POTW's actual, demonstrated capability to attain the requisite level of treatment.[79] As to the claim concerning section 403.7(b)(3), the court found that reducing removal credits in proportion to overflow might be cumbersome and might lead to granting fewer removal credits.[80] However, such reduction is necessary if, as the statute mandates, removal credits are only to reflect pollutants actually removed by the POTW.[81]

This strengthened the removal credit program by conditioning credits upon the actual pollutants removed and refusing to compromise the integrity of treatment.

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74. *Id.* at 649.

75. *Id.* at 649-50. The petitioners contended that the program was unworkable because POTWs can no longer predict removal in light of modification requirements, and therefore, industrial dischargers will need to install as much control technology as if removal credits had not been granted. *Id.* at 649. In addition, petitioners claimed that the program was unworkable based on the overflow compensation provision of § 403.7(b). *Id.* Petitioners claimed that POTWs would be unable to issue removal credits if they had to account for overflow because they could not estimate overflow. *Id.*

76. 40 C.F.R. § 403.7(f)(5) (1982), *amended by* 49 Fed. Reg. 31,212 (1984) and 52 Fed. Reg. 42,435 (1987) (current version at 40 C.F.R. § 403.7(f)(4) (1993)).

77. *Id.* § 403.7(b)(3) (1982), *repealed by* 52 Fed. Reg. 42,435 (1987).

78. National Ass'n of Metal Finishers, 719 F.2d at 649.

79. *Id.*

80. *Id.*

81. *Id.* The court also noted that "a POTW unable to estimate the time, let alone the amount, of untreated wastewater overflow may not be able to accurately predict the proportion of pollutants which it will remove. Requiring such an estimate thus has a rational basis under the Act." *Id.*

c. The Status of Removal Credits Immediately after *NAMF*

Although it seemed that the Third Circuit's ruling would quash all of the controversy over the removal credit provision, the EPA proposed substantial revisions to the program while litigation was pending.[82] In its proposed revision, the EPA authorized POTWs to grant removal credits based on national removal rates, as opposed to individual removal rates, as long as the POTW was in compliance with secondary treatment requirements or was within a year of being in compliance.[83] In addition, the revision responded to many of the petitioners' concerns. For example, the revision eliminated the requirement that POTWs had to take into account combined sewer overflows when granting removal credits.[84] The requirement that POTWs adhere to national removal rates instead of removal rates based on individual POTWs, which were based on plant-specific data, created additional concerns in the environmental community. This is because removal rates based on plant-specific data would necessarily be more protective of human health and the environment than national removal rates. The environmental community voiced these concerns in the following lawsuit. This major challenge to the removal credit provision, also brought before the Third Circuit resulted in *Natural Resources Defense Council, Inc. v. EPA (NRDC).*[85]

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82. *See* 47 Fed. Reg. 42,698 (1982).

83. *Id.* at 42,699.

84. *Id.*

> To ensure that the POTW's calculation of consistent removal accurately reflected the actual removal achieved, the 1981 amendments provided that the POTW must either take steps to contain overflow or adjust its consistent removal rate to account for overflow. Today's proposal dispenses with these overflow compensation requirements because, in the Agency's view, the overflow adjustment makes a negligible difference in the final removal credit.

Id. at 42,701.

85. 790 F.2d 289 (3d Cir. 1986), *cert. denied sub nom.* Chicago Ass'n of Commerce & Indus. v. Natural Resources Defense Council, Inc., 479 U.S. 1084 (1987). There had also been a challenge to the removal credit provision in the Seventh Circuit. *See* Cerro Copper Products Co. v. Ruckelshaus, 766 F.2d 1060 (7th Cir. 1985). In *Cerro Copper*, petitioner argued, among other issues, that the removal credit provision was an improper implementation of the Clean Water Act. *Id.* at 1069. The issue was whether the requirement that petitioners pretreat their pollutants was valid in light of the soon to be completed regional POTW that would be able to adequately remove these pollutants. *Id.* The court denied jurisdiction because petitioners did not bring the claim within the requisite ninety day statutory period. *Id.* The court did note, however, that "[t]he EPA's removal credit program effectuates Congressional intent to remove pollutants from our Nation's waters and thus . . . the program is a proper implementation of the Clean Water Act." *Id.* at 1070 (citing National Ass'n of Metal Finishers v. EPA, 719 F.2d 624, 646-50 (3d Cir. 1983), *rev'd on*

2. *Natural Resources Defense Council, Inc. v. EPA*

In this case, the court invalidated the EPA's 1984 removal credit rule on several grounds that drastically altered the removal credit scheme. First, EPA's definition of "consistent removal" as "average removal" violated the statutory requirement that removal credits only be granted if total removal (combined removal of the industrial discharger and the POTW) equaled that required of a direct discharger.[86] Second, by ignoring the effect of combined sewer overflow and not reducing the amount of removal credits accordingly, EPA violated the requirement of equal treatment of both direct and indirect dischargers.[87] Third, EPA's standards for modifying and withdrawing removal credits violated the Clean Water Act.[88] Finally, EPA cannot grant removal credits until the disposal and utilization of sludge are regulated pursuant to section 405 of the Clean Water Act.[89] As a result of this case, EPA suspended the removal credit program until 1991.

a. Consistent Removal

In deciding that EPA's definition of consistent removal was invalid,[90] the Third Circuit focused on the legislative history and purpose of the removal credit provision.[91] Congress enacted the removal credit program for two reasons: (1) to ensure that the combined treatment of the POTWs and the indirect industrial dischargers was equal to the treatment required of a direct discharger and (2) to avoid redundant treatment.[92] Consistent removal of pollutants is necessary in order to achieve these two goals.[93] Since EPA's revised rule made it easier for POTWs to grant

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other grounds sub nom. Chemical Mfrs. Ass'n v. Natural Resources Defense Council, Inc., 470 U.S. 116 (1985)).

86. *Natural Resources Defense Council,* 790 F.2d at 298-305.

87. *Id.* at 305-10.

88. *Id.* at 310-11.

89. *Id.* at 311-14.

90. *Id.* at 298-305. EPA's regulations had defined "consistent removal" to mean "removal that is achieved only 50% of the time . . . ." 49 Fed. Reg. 31,212 at 31,215 (1984).

91. *Natural Resource Defense Council*, 790 F.2d at 304.

92. *Id.*

93. *See id.* at 303. The court stated that

> [t]he amount of variability (or inconsistency) in POTW removal is particularly important where the removal credit is great. In this situation, most of the removal required in reaching BAT-equivalent levels of treatment will be performed by the POTW, not by the indirect discharger. Thus, the consistency of performance that the indirect discharger achieves in removing the small

removal credits while decreasing the level of consistency necessary for granting the credits, there was a great likelihood that irreparable damage could have been done to the ecology of the receiving body of water. For these reasons, the court invalidated EPA's 1984 definition of consistent POTW removal.[94]

b. Combined Sewer Overflow (CSO)

The court held that the CSO provision, which did not require the POTW to take into account overflow when issuing removal credits, violated the Clean Water Act in two respects. First, since there is a great amount of variability among POTWs and the events of overflow, basing removal credits on an average rate of overflow is contrary to the statute which mandates that removal credits are to be granted only for actual removal.[95]

Secondly, POTWs must take CSO into consideration when granting removal credits because any rise in the level of pollutants discharged by the combination of indirect dischargers and POTWs is inconsistent with the statutory purpose.[96]

This decision strengthened the integrity of the removal credit program in that POTWs could only grant removal credits based on actual removal.

> share of the toxics that it must remove will be relatively unimportant in comparison to the large amount of reliability in the POTW's performance in removing the largest share for which it is responsible.

Id. The direct discharger is required to implement the Best Available Technology (BAT) to treat its pollutants. 33 U.S.C. § 1311(b)(2)(A) (1988). The combined treatment of the indirect discharger and the POTW must also meet BAT. *See* 33 U.S.C. § 1317; H.R. CONF. REP. NO. 95-830, 95th Cong., 1st Sess. 87 (1977), *reprinted in* 1977 U.S.C.C.A.N. 4424, 4462.

94. *Natural Resources Defense Council,* 790 F.2d at 305.

95. *Id.* at 307-08. The court quoted EPA's preamble to the 1984 rule:

> [t]he Agency has concluded . . . that Congress intended that a removal credit be granted for a particular pollutant only to the extent that a particular POTW can demonstrate that it removes the pollutant. The language of the statute, buttressed by the legislative history, indicates that removal credits are to be based upon case-by-case removal determinations . . . .

Id. at 308 (quoting 49 Fed. Reg. 31,212-13).

96. *See id.* at 308.

c. Withdrawal or Modification of Removal Credits

Under the 1984 rule, EPA allowed a POTW to withdraw a credit only if the POTW's removal rate is "consistently and substantially" below the allowable rate.[97] Prior to the 1984 revision, a POTW could withdraw or modify a removal credit whenever the POTW's removal rate dropped enough so that it no longer fulfilled its statutory duties.[98] By mandating that the removal rate be consistently and substantially below the allowable rate, the 1984 rule did not permit a POTW to withdraw or modify removal credits at any time that it could no longer provide adequate treatment. So, under the 1984 rule, only an egregious violation would trigger the withdrawal or modification of removal credits. The court, finding this change unacceptable, stated that:

> EPA has relaxed both the consistency and the amount of removal of pollutants required of POTWs and indirect dischargers. Under this test, even *grossly inconsistent* removal will not be sufficient cause for withdrawal of a credit; and even removal *substantially below* the required amount will not be sufficient cause for withdrawal of a credit.[99]

d. Sludge Contamination

When the POTW fails to adequately treat all of the toxics within industrial waste streams, these toxics are concentrated in POTW sludge. This toxic concentration poses a problem when the sludge is disposed or used. Therefore, it is desirable to isolate these toxic pollutants in small volume industrial sludges, rather than in larger volume POTW sludge.[100] This can only occur through industrial pretreatment.[101] Since EPA had failed to promulgate sludge regulations, the Third Circuit held that POTWs could not issue removal credits because there were no standards to ensure safe and adequate handling of the potential increase in toxic POTW sludge.[102]

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97. 49 Fed. Reg. 31,212 at 31,224 (1984).

98. *See* 46 Fed. Reg. 9404, 9439-40 (1981).

99. *Natural Resources Defense Council,* 790 F.2d at 311 (emphasis in original).

100. *See* 46 Fed. Reg. 9404, 9410 (1981).

101. *Natural Resources Defense Council,* 790 F.2d at 312.

102. *Id.* at 314. Because EPA had failed to meet "the statute's command for a comprehensive framework to regulate the disposal and utilization of sludge," it could not, "in the

e. The Status of Removal Credits Immediately after *NRDC*

As a result of this case, there was a judicial ban precluding or nullifying the issuance or use of removal credits until EPA promulgated the requisite sludge regulations.[103] In response, Congress stayed the Third Circuit's decision with respect to the availability of removal credits until the issuance of sludge regulations.[104] Similarly, Congress stayed the decision with respect to removal credits granted prior to the promulgation of such regulations until after August 31, 1987.[105]

The EPA reinstated the 1981 regulations as the rules that would govern the granting of removal credits once sludge regulations were promulgated.[106] The 1981 regulations would replace only those 1984 rules which the court invalidated in *NRDC*.[107] Since *NRDC,* several lawsuits sought to compel EPA to begin processing applications for removal credits and to promulgate sludge use and disposal regulations.[108]

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absence of the section 405 regulations, authorize the issuance of removal credits under section 307(b)(1)." *Id.*

103. *See id.*

104. Water Quality Act of 1987, Pub. L. No. 100-4, § 406(e), 101 Stat. 7, 74 (1987). Congress declared that:

> [The decision] is stayed until August 31, 1987, with respect to—
> (1) those publicly owned treatment works the owner or operator of which received authority to revise pretreatment requirements under section 307(b)(1) [33 U.S.C. § 1317(b)(1)] before the date of the enactment of this section [Feb. 4, 1987], and
> (2) those publicly owned treatment works the owner or operator of which has submitted an application for authority to revise pretreatment requirements under such section 307(b)(1) [33 U.S.C. § 1317(b)(1)] which application is pending on such date of enactment [Feb. 4, 1987] and is approved before August 31, 1987.
> The Administrator shall not authorize any other removal credits under such Act until the Administrator issue the regulations required by paragraph (2)(A)(ii) of section 405(d) of such Act, as amended by subsection (a) of this section [33 U.S.C. § 1345(d)(2)(A)(ii)].

Id.

105. *Id.*

106. *See* General Pretreatment Regulations, 52 Fed. Reg. 42,435 at 42,436 (1987).

107. *Id.*

108. *See, e.g.,* Chicago Ass'n of Commerce & Indus. v. Thomas, No. 87-C-6353, 1987 WL 19166 (N.D. Ill. Oct. 28, 1987) (holding that EPA can not begin processing an application for removal credits until it first promulgates sludge regulations), *amendment denied by* 1987 WL 28274 (N.D. Ill. Dec. 11, 1987), *aff'd,* 873 F.2d 1025 (7th Cir. 1989); LTV Steel Co. v. Thomas, No. 88-C-2130, 1988 WL 121576 (N.D. Ill. Nov. 9, 1988) (dismissing plaintiff's claims that the Administrator is in violation of the CWA for failing to promulgate sludge requirements, that the Administrator should be required to review an application for removal credits and that plaintiff need

not install proper pollution control devices in its facility); Armco, Inc. v. EPA, 869 F.2d 975 (6th Cir. 1989) (finding that EPA could not issue removal credits until it promulgates sludge regulations and that even if plaintiff had filed the action timely, the stay on issuing removal credits does not deny the plaintiff corporation a vested and equitable right). In *Chicago Ass'n of Comm. & Industry v. Thomas*, the district court ordered EPA to "comply with its own regulations . . . [but refused to] order the EPA to undertake any extraordinary measures to act on the application." Chicago Ass'n of Commerce v. Thomas, No. 87-C-6353, 1987 WL 19166, at *5 (N.D. Ill. Oct. 28, 1987). The court held that, "the EPA's regulations do not require it to begin processing the application until the [POTW] can state that it does not violate the sludge requirements. So long as the sludge requirements remain non existent, the EPA need not 'act' on the [POTW's] application." *Id*.

On appeal, appellants argued that (1) the POTW in question should not have been able to grant removal credits since the August 31, 1987 deadline had passed, and (2) that EPA should have at least begun processing the POTW's application to issue credits even if the Agency had not yet promulgated sludge regulations. Chicago Ass'n of Commerce & Indus. v. EPA, 873 F.2d 1025, 1030 (7th Cir. 1989). The plaintiffs supported their first argument by focusing on a strained interpretation of the "stay" provision in the Water Quality Act amendment. They asserted that the stay did not include credits which had not received authorization before the 1987 deadline. *Id*. at 1031-32. The plaintiff's second argument, that EPA should begin processing the application for removal credits prior to the promulgation of sludge regulations, was based on their desire to obtain expedited treatment since the sludge requirements were issued. While the court voted that the plaintiffs were in a "Catch-22" situation, corporate plaintiffs cannot be in a position to receive expedited treatment until EPA issues sludge regulations. *Id*. at 1032. Holding that EPA cannot authorize a POTW to grant any removal credits until sludge regulations exist, the court stated that:

> [t]he reason that Congress felt that a stay was needed for these POTWs was clearly that it believed that the POTWs could not continue to grant removal credits *during the interim period* in the absence of such a stay. Why? Because the grant of any removal credit under section 1317(b)(1) is expressly conditioned on compliance with sludge standards, and no POTW can comply with the standards until they have been promulgated. *Id*. (emphasis in original).

The only remaining recourse for the appellants was a suit seeking to compel EPA to actually perform its nondiscretionary duty and promulgate sludge standards. *Id*. However, such a suit had already been filed in an Illinois district court. *Id*. (citing LTV Steel Co. v. Thomas, No. 88-C-2130, 1988 WL 121576 (N.D. Ill. Nov. 9, 1988)). This case was later dismissed because of plaintiff's failure to give EPA the required sixty days notice. *Id*. at *3. "No action may be commenced . . . prior to sixty days after plaintiff has given notice of such action to the Administrator. . . ." 33 U.S.C. § 1365(b)(2) (1988).

Therefore, although the court recognizes this "Catch-22" situation action cannot be taken until the EPA promulgates sludge regulations, and fills the "regulatory vacuum." *Chicago Ass'n of Commerce & Indus.*, 873 F.2d at 1032. This is, as the court notes, a "Catch-22" situation because there really is no escape for plaintiff's dilemma. The plaintiffs want to ensure quick and expedient processing of their applications for removal credits once the sludge regulations are promulgated. Yet, the plaintiffs cannot ensure expedient treatment because EPA cannot begin reviewing plaintiffs' applications until after it promulgates sludge regulations. *See* Barry Kellman, *The Seventh Circuit on Environmental Regulation of Business*, 65 CHI.-KENT L. REV. 757, 792 (1989). This frustration is, unfortunately, one often felt in connection with environmental legislation. *Id*. at 793.

> What happens when that agency [EPA], either because of political hostility to environmental regulation or incompetence, fails to make such decisions? A bad decision may be judicially reviewed; a failure to decide leaves the court

3. Statutory and Regulatory Responses

Since *NRDC* and EPA's 1987 notice reinstating the 1981 removal credit regulations, EPA has promulgated two sets of sludge regulations. The first, entitled Solid Waste Disposal Facility Criteria, establishes management practices for non-hazardous waste landfills.[109] The second, Standards for the Use or Disposal of Sewage Sludge, applies to more specific disposal and usage practices such as land application, incineration and surface disposal.[110]

The Solid Waste Disposal Facility Criteria fulfills EPA's requirement under the Clean Water Act to establish standards for sludge that is co-disposed with municipal solid wastes in municipal landfills.[111] Once these regulations were promulgated, a POTW could obtain the authority to grant removal credits if it disposed of its sludge in a municipal solid waste landfill that met the criteria set forth in the 1991 rule.[112] The sludge disposal regulations differ depending upon which method a POTW chooses to dispose of its sewage sludge.[113] The EPA then promulgated a separate regulation to establish standards for sludge that is disposed of in monofills, landfills in which only sewage sludge is disposed.[114] Neither the sludge disposal regulations for co-disposal nor the regulations for monofill disposal became effective until 1993.[115]

> without activity since no court is likely to take upon itself the task of administering the removal credits program. Undeniably, therefore, the best way to frustrate accomplishment of the goals of the Clean Air and Clean Water Acts is for EPA to simply procrastinate.

Id.

109. 56 Fed. Reg. 50,978 (1991) (to be codified at 40 C.F.R. §§ 257, 258).

110. 58 Fed. Reg. 9248 (1993) (codified at 40 C.F.R. §§ 257, 403, 503).

111. *See* 56 Fed. Reg. 50,978 at 50,979 (1991).

112. *See id.* at 50,998. The 1991 rule promulgates revised minimum federal criteria for municipal solid waste landfills such as "location restrictions, facility design and operating criteria, ground-water monitoring requirements, corrective action requirements, financial assurance requirements, and closure and post-closure care requirements . . . . [And it] establishes differing requirements for existing and new units (e.g., existing units are not required to remove wastes in order to install liners)." *Id.* at 50,978.

113. There are many ways to dispose of sludge such as the application of sludge to agricultural and non-agricultural lands, the distribution and marketing (the sale or giving away of sludge for use in home gardens), the disposal in municipal landfills, the disposal in sludge-only landfills, and the use of surface disposal sites, incineration or ocean disposal. *See* 58 Fed. Reg. 9248, 9253 (1993).

114. 58 Fed. Reg. 9248 (1993) (codified at 40 C.F.R. §§ 257, 403, 503) (1993).

115. The effective date for the regulations governing co-disposal was October 9, 1993. 56 Fed. Reg. 50,978 (1991) (codified at 40 C.F.R. §§ 257, 258). The effective date for monofill disposal was March 22, 1993. 58 Fed. Reg. 9248 (1993) (codified at 40 C.F.R. §§ 257, 403, 503).

4. The Final Court Challenge

The most recent court challenge to the removal credit provision occurred after EPA promulgated standards for sludge use and disposal.[116] In *Sierra Club v. EPA,* the petitioners argued that the Agency's refusal to promulgate numeric limits in setting sludge standards violated section 405 of the Clean Water Act.[117] Pursuant to section 405 of CWA, the Administrator of the EPA is required to establish numerical limitations for toxins in co-disposed sludge.[118] Numerical limitations are intended to provide safe concentrations of each toxic substance within sewage sludge thereby aiding in the safe use of the sludge. However, if the Administrator finds that it is not feasible to establish such numerical limitations, the Agency may substitute "a design, equipment, management practice, or operational standard, or combination thereof which in the Administrator's judgment is adequate to protect public health and the environment . . . ." The EPA concluded that numerical limitations were not feasible and relied on the design and operation of municipal solid waste bend fills to protect human health and the environment.[119] Petitioners contest EPA's decision not to establish numerical limitation on the grounds that the Agency should have applied the numerical limitations it established to govern all uses of sewage sludge other than co-disposal to also govern the uses of co-disposed sludge. Holding that EPA's reasons for its failure to set numeric limits were valid, the court found no merit to the petitioner's argument.[120] Although the court acknowledged that the failure to promulgate numerical limitations might be problematic, it concluded that "if it is a problem, [it] is inherent in the legislation."[121]

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116. Sierra Club v. EPA, 992 F.2d 337 (D.C. Cir. 1993).

117. *Id.* at 340-41.

118. 33 U.S.C. § 1345(d)(2) (1988).

119. *Sierra Club,* 992 F.2d 337, 340 (D.C. Cir. 1993).

120. Solid Waste Disposal Facility Criteria, 56 Fed. Reg. 50,978 at 50,997 (1991) (codified at 40 C.F.R. §§ 257, 258). "While EPA decided that numerical limitations for co-disposed sewage sludge were not feasible, the Agency determined that the design standards . . . were adequate to protect human health and the environment. The design and engineering standards will prevent the migration of harmful pollutants from the waste leachate. Further, the rule prescribes measures in the event of migration of pollutants. In these circumstances, EPA concluded that these requirements met the protection standard of section 405." *Id.* The court accepted the Agency's assertion that numerical limits were not feasible because of scientific gaps in both the effects of chemical reaction between sewage sludge and solid waste and the chemical composition of landfills. *Sierra Club*, 992 F.2d at 340-41.

121. *Sierra Club*, 992 F.2d at 342.

Although the D.C. Circuit recognized that potential problems exist within the promulgated sludge regulations, the court refused to remedy the regulations. It remains to be seen whether the sludge regulations will be upheld when challenged on an as-applied basis rather than on a prima facie basis. Perhaps the future of the removal credit program will mimic the past and will depend upon the promulgation of adequate sludge regulations.

IV. PROGRAM IMPLEMENTATION: PAST AND FUTURE

A. Introduction

When the *NRDC* decision suspended the removal credit program in 1986, twelve POTWs had EPA approval to grant removal credits.[122] Another fifteen POTWs had applications pending.[123] As of 1986, POTWs had issued removal credits for sixteen pollutants, and approximately 150 industrial indirect dischargers were involved in the program.[124] The status of removal credits has not dramatically changed since EPA's issuance of sewage sludge regulations. No POTW has issued removal credits since the program was suspended.[125] There is one removal credit application pending, but to date there has been no decision on this application.[126]

The lack of interest in removal credits is not surprising. EPA did not expect there to be a resurgence of interest once sludge regulations were promulgated.[127] Although the program originally seemed economically beneficial and environmentally promising, the current status and history of the removal credit provision tell a different story. As discussed, a multitude of problems has plagued the program since its inception. Implementing the program may be a process too complex and too difficult for the program to live up to its expectations. These problems result predominately from POTW noncompliance, from the

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122. EPA PRETREATMENT REPORT, *supra* note 6, at ES-7.

123. *Id.* Similarly, no decisions could be made regarding these fifteen applications until EPA promulgated sludge regulations.

124. *Id.*

125. Telephone Interview with Mark Charles, *supra* note 6.

126. *Id.*

127. EPA PRETREATMENT REPORT, *supra* note 6, at 9-4. "Future POTW interest in removal credits, once they are available again, is expected to be low; however, increased regulation of organic pollutants in recently promulgated and forthcoming guidelines may renew interest in removal credits for some organic compounds." *Id.*

overwhelming number of variables that a POTW must consider before it grants the credits and from the failure of economic incentives to encourage industry to cooperate with the POTWs and facilitate their operation and maintenance.[128]

B. POTW Noncompliance

Since only a POTW that has an approved pretreatment program can issue removal credits, the POTW must consistently remove pollutants and meet EPA's standards prior to granting removal credits to an indirect discharger.[129] If a POTW is noncompliant and cannot meet the requisite standards, then it will be unable to grant removal credits. So, in essence, the removal credit program's success is predicated on POTW compliance. Currently, about thirty percent of all POTWs are in reportable noncompliance.[130] Reportable noncompliance is determined by evaluation of the following criteria: "(1) control mechanisms; (2) inspection and sampling; (3) POTW enforcement; (4) POTW reporting to the approval authority; and (5) various other requirements."[131] Noncompliance is a result of many different factors such as inadequate funding, inefficient POTW design, underpaid and underqualified POTW personnel, enforcement problems and the low priority of sewage disposal in communities.[132]

1. Inadequate Funding

To facilitate compliance with treatment standards, Title II of the Clean Water Act authorizes federal grants for the construction of POTWs.[133] The federal grant program assists local communities in the

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128. *See supra* part I.

129. *See supra* parts I and II.

130. Telephone Interview with Mark Charles, *supra* note 6.

131. EPA PRETREATMENT REPORT, *supra* note 6, at 9-4.

132. *See* Note, *Regulation of Noncompliant Publicly Owned Treatment Works Under the Clean Water Act,* 10 WM. MITCHELL L. REV. 901, 911-15 (1984) [hereinafter POTW Note].

133. *See* 33 U.S.C. §§ 1251(a)(4), 1281(g)(1) (1988 & Supp. II 1990). Section 1251(a)(4) provides that "[i]t is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works."

Section 1281(g)(1) provides that

> The Administrator is authorized to make grants to any State, municipality, or intermunicipal or interstate agency for the construction of publicly owned treatment works . . . . [G]rants under this subchapter shall be made only for projects for secondary treatment or more stringent treatment, or any cost effective alternative thereto . . . .

construction of POTWs. Unfortunately, despite the federal government's financial commitment, the available funding was inadequate to construct all necessary treatment works.[134] Congress underestimated the cost of attaining adequate secondary treatment requirements.[135] Although Congress has traditionally allocated four billion dollars a year in grants for POTW construction, the money required to meet water quality standards has consistently been well over the four billion dollar mark.[136] Therefore, as Congress keeps decreasing the funds it allocates to the construction grant program, the price of attaining water quality standards keeps rising.

Another problem with federal funding is that available funds are often poorly distributed.[137] This occurs because grants are not issued on a need basis, but are awarded on a priority basis where top priority goes to those communities that will achieve the highest degree of pollution reduction per dollar.[138]

In addition to inadequate funding, grant program delays have contributed to POTW noncompliance.[139] The availability of funds has an enormous impact on noncompliance because the POTWs are encouraged

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134. POTW Note, *supra* note 132, at 906. The Senate realized the inadequacy of funding as early as 1972: "[t]he lack of adequate funding of grants to assist States and localities in constructing sewage treatment plants is causing critical problems." S. REP. NO. 414, 92nd Cong., 2nd Sess. (1972), *reprinted in* 1972 U.S.C.C.A.N. 3668, 3682.

135. *See* Kurt M. Hunciker, *The Clean Water Act of 1977—Modification of the Municipal Program,* 2 HARV. ENVTL. L. REV. 127, 129 (1977); *see Implementation of the Federal Water Pollution Control Act (Concerning the Performance of the Municipal Wastewater Treatment Construction Grants Program): Hearings Before the Subcomm. on Investigations and Oversight of the House Comm. on Public Works and Transportation,* 97th Cong., 1st Sess. 1742 (1981) [hereinafter *POTW Construction Grants Program Hearing*].

136. POTW Note, *supra* note 132, at 906-07.

137. *See* Marcia R. Gelpe, *Pollution Control Laws Against Public Facilities,* 13 HARV. ENVTL. L. REV. 69, 75-76 (1989).

138. *Id.* at 75. Large communities with more industry and discharge often receives funds before smaller communities. Although the large communities do have a larger volume of discharge, they are better equipped to fund themselves through municipal taxes than are smaller communities simply because of the size of the communities. Therefore, the distribution of funds should not be solely based on the volume of discharge. *Id.*

139. *See id.* at 76-77; POTW Note, *supra* note 132, at 909-11. Grant delays made treatment deadlines unattainable and increased construction costs. *Id.* Thus, from the inception of the removal credit program, POTWs were fighting a losing battle in terms of meeting regulatory deadlines and minimizing costs. If more funds had to be channeled into the construction of the facility, then less funds were available for the maintenance and operation of the facility. If less funds were available to ensure adequate treatment, then there was a greater likelihood that POTWs would not achieve quality treatment. *See id.*

to wait for federal funds rather than to solve any problems themselves.[140] In addition, grant delays increase project costs, making noncompliance more likely because of the limited federal funds.[141] Although there are alternative means for obtaining funds for POTW construction, low visibility of POTWs and lack of public awareness of the importance of good sewage treatment make it difficult for the facilities to successfully compete for revenues against highly-visible, popular programs.[142]

2. Ill-Equipped POTWs

POTW's cannot attain compliance if they are poorly designed and cannot effectively treat sewage.[143] EPA needs to be more aware of community needs and more realistic about the community's capability to design and construct a cost-efficient POTW.[144]

In addition to reevaluating the needs and expertise of communities, EPA needs to reevaluate the operation and management of POTWs. "[S]tudies repeatedly indicate that noncompliance with present water quality standards is largely due to substandard [operation and maintenance] of expensive POTWs."[145] Neither an increase in federal funding nor better designed facilities will stop noncompliance if the POTWs are unable to operate properly.[146]

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140. Gelpe, *supra* note 137, at 76-77.

141. *See* POTW Note, *supra* note 132, at 911.

142. *See generally* POTW Note, *supra* note 132.

143. These design problems were apparent as early as the late 1970s. When designed, many POTWs did not adequately account for population growth or sewer-induced growth. Therefore, while many facilities were "overdesigned" for the current uses, they were underdesigned for future use. In addition, other facilities were underdesigned to begin with. *See* POTW Note, *supra* note 132, at 911-13. "Since the program's inception . . . the EPA has squandered precious appropriations by financing overly expensive, needlessly sophisticated, and environmentally suspect POTWs which are wholly inconsistent with community needs." *Id.* at 912.

144. *See id.* at 912-13; *POTW Construction Grants Program Hearing*, *supra* note 135, at 9. It was estimated, as early as 1981, that between ten and twenty percent of POTWs are poorly designed. H.R. REP. NO. 30, 97th Cong., 1st Sess. 15-16 (1981).

145. POTW Note, *supra* note 132, at 913 (citing *POTW Construction Grants Program Hearing*, *supra* note 135, at 9).

146. As noted by the Senate in the early years of the removal credit program, "[t]he Federal water pollution control program suffers from a lack of information concerning dischargers, amounts and kinds of pollution, abatement measures taken, and compliance . . . . [It] also suffers from a lack of adequate research and demonstration beyond the traditional methods used in municipal treatment plants." S. REP. NO. 414, 92nd Cong., 2d Sess. (1972), *reprinted in* 1972 U.S.C.C.A.N. 3668, 3673.

3. Enforcement Problems

When a public facility is in violation of the Clean Water Act, EPA has no effective means by which it can make the POTW comply.[147] Injunctions and the threat of shutting down the facility are neither practical nor helpful.[148] Although sanctions and administrative compliance orders can also be issued for noncompliance, they are often just as ineffective.[149] Even if EPA imposed civil penalties or sanctions, the taxpayers within the community and not those truly responsible for noncompliance would ultimately pay those fines.[150]

4. Sewage Treatment as a Low Priority

Another general cause of POTW noncompliance is that communities fail to consider sewage disposal to be an important issue.[151] "Damage to water quality is not a visible phenomenon, and its effects may not be immediately felt by the public . . . . [T]he people in a community do not create pressure for good sewage treatment unless their toilets stop working."[152] An understanding of the importance of sewage

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147. The EPA's water pollution control programs have consistently been plagued with enforcement problems. Even when water pollution control focused primarily on water quality standards rather than effluent limitations, EPA had a lack of enforcement. *See id.* at 3672.

148. *See* Gelpe, *supra* note 137, at 78.

> The lack of a shutdown option is rare for private facilities but typical with public facilities. They provide essential public services not provided by the public sector. Shutdowns are impractical in most communities; you can't stop people from flushing toilets, and the sewage must go somewhere. Usually, the only short term alternative to the existing treatment system is discharging raw sewage.

Id.

149. *See id.* at 79; *see also* POTW Note, *supra* note 132, at 523-25; Gold, *supra* note 137, at 523-25 (discussing sanctions and administrative compliance orders). A prime example of this is a recent lawsuit filed by EPA against Louisiana and the New Orleans Sewerage and Water Board (S&WB). The S&WB is being fined for 1178 environmental violations that fall within three types: (1) the release of inadequately treated waste during rainfall (CSO problems); (2) the release of sewage into drainage canals emptying into Lake Pontchartrain due to broken sewer pipes; and (3) improper operation of the POTW. Mark Schleifstein, *S&WB is Sued, May be Fined for River Sewage,* TIMES-PICAYUNE, Oct. 1, 1993, at B1. The parties tried to reach a settlement, but monetary fines are seen as the only solution. *Id.* According to the acting EPA Regional Administrator Joe Winkle, "[t]hese kinds of discharges pollute our waterways, and we must do everything we can to stop them, including aggressive enforcement actions like these." *Id.*

150. POTW Note, *supra* note 132, at 926.

151. *See* Gelpe, *supra* note 137, at 74-75.

152. *Id.* at 75.

treatment and an increase in public awareness can potentially decrease noncompliance.

C. *Complexity of Factors*

When granting removal credits, a POTW must take an overwhelming number of factors into consideration.[153] The complexity of the program is in itself an impediment to its success. With lack of funding, poorly designed facilities, poorly distributed funds and lack of any true enforcement, it is already difficult for POTWs to operate and successfully treat domestic sewage.[154] Under the removal credit programs, POTWs would have to adequately treat industrial discharge as well as treat domestic sewage and comply with CWA requirements. POTWs would also have to take into account combined sewer overflow, ensuring that none of the toxic pollutants from indirect discharges are interfering with or passing through the entire process. Factoring all of these variables into the calculation, it is no wonder that the removal credit program has encountered so many difficulties.

D. *The Failure of Economic Incentives*

In theory, the removal credit program was instituted "to avoid treatment for treatment's sake."[155] It makes sense theoretically that pretreatment of pollutants may not be necessary if POTWs adequately treat the pollutants.[156] The removal credit program makes even more sense in that it encourages industries to help finance the development and use of the POTWs. Because industries may reap the benefits of an over compliant POTW, industrial sources have an incentive to develop efficient POTW technology.[157] In reality, however, this incentive is not

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153. *See supra* part I.

154. *See supra* part II.B.

155. 123 CONG. REC. 38,966 (1977); *see also* SENATE COMM. ON ENVIRONMENT AND PUBLIC WORKS, 95TH CONG., 2D SESS., A LEGISLATIVE HISTORY OF THE CLEAN WATER ACT OF 1977, 343 (Comm. Print 1978).

156. *See id.* at 462.

157. *See* Barry Kellman, *The Seventh Circuit on Environmental Regulation of Business*, 65 CHI.-KENT L. REV. 757, 791 (1989).

> The POTW, once in operation, serves not only contributing facilities but everyone in the region as well. Therefore, it is to the advantage of both industry and the environment to spend capital for the control technology collectively on a single regional POTW . . . . The "removal credits" provide an incentive for private industry to contribute to the large capital costs of

enough to propel the removal credit program from a theoretically available program to a realistically viable program.

V. ENVIRONMENTAL REGULATION AND ECONOMIC INCENTIVE

A. Introduction: A Background to Economic Regulations

Within the past twenty years environmental policy has moved away from conventional regulation.[158] When the environmental movement was first born, command-and-control approaches dominated the regulatory scene.[159] Command-and-control regulations often set lofty goals and institute strict technology and performance standards that are often very inflexible and that tend to pursue environmental protection regardless of cost.[160] The Clean Water Act is an example of such regulation. The CWA seeks "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective . . . it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985."[161] The Act

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> constructing a POTW on the expectation that those industries can attain compliance for less total outlay than if each facility installed its own control devices. Furthermore, the program prevents redundant treatment; without it, industry would face duplicative costs for wastewater treatment.

Id.

158. Environmental statutes such as the Toxic Substances Control Act (TSCA), 15 U.S.C. §§ 2601-2671 (1988), the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901-6992k (1988 & Supp. II 1990) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601-9675 (1988), mark a departure from strict command-and-control regulations. TSCA, RCRA and CERCLA incorporate components of risk balancing (environmental cost-benefit analysis) within their statutory schemes. In addition, traditional command-and-control statutes have incorporated elements of incentive-based approaches within their more traditional statutory schemes (e.g., the ERC provision in the Clean Air Act). *See generally* Bartfeld, *supra* note 9; Breger, *supra* note 7; Hahn & Stavins, *supra* note 7.

159. The command-and-control approach is apparent in both the Clean Air Act, 42 U.S.C. §§ 7401-7671q (1988 & Supp. IV 1991), and Clean Water Act, 33 U.S.C. §§ 1251-1387 (1988 & Supp. IV 1991). Both statutes impose specific, uniform controls on permissible emissions limits or effluent discharges. *See, e.g.,* 42 U.S.C. § 7411(a)(1)(C); 33 U.S.C. § 1316(a)(1).

160. Best Available Technology is an example of such performance standard. Performance standards pervade many environmental statutes, such as CAA and CWA. 42 U.S.C. § 7411(a)(1)(C); 33 U.S.C. § 1316(a)(1). BAT attempts to produce technological innovation to insure that pollution can be abated. Unfortunately, there are many drawbacks to the BAT approach. For example, BAT may decrease industry incentives to innovate, since if a technological innovation is developed, industries will have to expend money to incorporate the innovation into their pollution control systems. In addition, BAT standards do not take into consideration smaller polluters that cannot afford expensive pollution control innovation. *See generally* Cass Sunstein, *Paradoxes of the Regulatory State,* 57 U. CHI. L. REV. 407 (1990).

161. 33 U.S.C. § 1251(a)(1).

tried to accomplish this unattainable goal through the imposition of such technology-forcing standards as Best Available Technology (BAT).[162]

Unfortunately, while uniform technology-based and performance standards may seem effective, they are often economically unsound. Command-and-control regulations often can only achieve their lofty goals at a high price.[163] This happens because the regulations are blind to considerations such as varying costs of attaining the requisite pollution control among different polluters.[164] In addition, technology-forcing standards can often slow or deter the development of pollution control technology.[165]

Command-and-control regulations can also be self-defeating in that overregulation produces under-regulation.[166] This paradox occurs because the lofty goals of command-and-control regulations typically prohibit any balancing of interests or trade-off. Although the importance of environmental protection should ideally outweigh all other costs, realistically, this mentality is unfortunately counterproductive. By over regulating, regulators are less inclined to act and enforce the regulations due to unachievable goals and political opposition, especially from industrial polluters.[167]

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162. *Id.* § 1311(b)(2)(A).

163. For example, technology-based standards do not achieve an effective allocation of the cost of pollution control. Smaller or older polluting facilities often do not have the necessary resources to achieve the requisite control technology. Yet under the conventional command-and-control approach, these facilities must often use unduly expensive control technology in order to meet the requisite pollution standard. *See* Hahn & Stavins, *supra* note 7, at 6; *see generally* T.H. TIETENBERG, EMISSIONS TRADING: AN EXERCISE IN REFORMING POLLUTION POLICY (1985); Breger et al., *supra* note 7.

164. *See* Hahn & Stavins, *supra* note 7, at 6.

165. *See* Sunstein, *supra* note 160, at 417-18.

> The BAT approach, however, can defeat its own purposes and thus produce a regulatory paradox . . . . Perversely, requiring adoption of the BAT eliminates the incentive to innovate at all, and indeed creates disincentives for innovation by imposing an economic punishment on innovators. Under the BAT approach, polluting industries have no financial interest in the development of better pollution control technology that imposes higher production costs. Indeed, the opposite is true. The BAT approach encourages industry to seek any means to delay and deter new regulation.

Id. at 420.

166. *Id.* at 413. In other words, by imposing inflexible, lofty standards, Congress has produced inertia rather than aggressive environmental change. "This surprising outcome arises when Congress mandates overly stringent controls, so that administrators will not issue regulations at all, or will refuse to enforce whatever regulations they or Congress have issued." *Id.*

167. *See id.* at 415-16; *see also* TIETENBERG, *supra* note 163, at 15-16.

In response to the shortcomings of command-and-control regulations, policymakers and legislators have turned to economic incentives to aid in environmental protection.[168] Gone are the "heady salad days"[169] of environmentalism and the deep distrust of economic thinking.[170] In reality, economic regulations provide polluters with incentives to develop technology that will result in a cleaner environment. In addition, incentive-based regulations tap into the competitive capitalist market by encouraging polluters to monitor each other and by encouraging polluters to invest in research and development so they can compete more effectively in the marketplace.[171] Another important benefit of incentive-based regulations is that they focus more on the policies rather than on technology or performance standards. Therefore, these regulations eliminate from the environmental debate the complex, technical jargon that often impedes the understanding of environmental issues.[172]

There are currently five major categories of incentive-based regulations being used to protect the environment: (1) pollution charges;

> The fundamental problem with the command-and-control approach is a mismatch between capabilities and responsibilities. Those with the incentive to allocate the control responsibility cost effectively, the control authorities, have too little information available to them to accomplish this objective. Those with the best information on the cost-effective choices, the plant managers, have no incentive either to voluntarily accept their cost-effective responsibility or to transmit unbiased cost information to the control authority so it can make a cost-effective assignment. Plant managers have an incentive to accept as little control responsibility as possible in order to maintain or strengthen their competitive positions.

Id.

168. *See infra* part V.B.

169. Breger et al., *supra* note 7, at 464. The ERC program is such an example. The industries that can afford to invest in research and development will do so in hopes to decrease their emissions so they can sell their right to pollute to other industries that do not have the money to invest in more effective pollution control technology.

170. *See id.* at 464.

> There has been some degree of ideological and intellectual opposition to the use of market incentives . . . . "the market produced the problem, how can it solve it?" Nobody really has the moral high ground here . . . . [I]t is a pragmatic issue about what sort of policy, institutions, and tools are best suited to achieving our environmental quality goals.

Id. at 469-70.

171. *See* Hahn & Stavins, *supra* note 7, at 13; *see also* Breger et al., *supra* note 7, at 469-70.

172. *See* Hahn & Stavins, *supra* note 7, at 13-14 (citing Ackerman & Stewart, *Reforming Environmental Law,* 37 STAN. L. REV. 1333, 1346 (1985)).

(2) market barrier reductions; (3) government subsidy elimination; (4) deposit-refund systems; and (5) marketable permits.[173]

B. Current Programs Using Economic Incentives

Perhaps the most successful implementation of market-based incentives has been in terms of marketable permits and the emission reduction credit (ERC) program.[174] Reductions from either stationary, area, or mobile sources create ERCs.[175] When one of these sources reduces its emissions beyond the requisite level, it may sell the additional amount that it can lawfully pollute to polluters that are polluting above the requisite level.[176] The ERC program contains a built in safety check to ensure that emissions trading does not violate the Clean Air Act.[177] Only pollution reductions which are permanent, surplus and quantifiable can qualify as ERCs and be used in emissions trading.[178]

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173. *See id.* at 7.

174. *See* Chevron USA, Inc. v. Natural Resources Defense Council, Inc., 467 U.S. 837, 847-48 (1984) (discussing EPA's implementation of emissions trading); *see generally* Emissions Trading Policy Statement: General Principles for Creation, Banking, and Use of Emission Reduction Credits, 51 Fed. Reg. 43,814 (1986).

175. *See* 51 Fed. Reg. 43,814 at 43,831 (1986). A stationary source is "any building, structure, facility, or installation which emits or may emit any air pollutant." 42 U.S.C. § 7411(a)(3) (Supp. III 1991). An area source is "any small residential, governmental, commercial, or industrial source." TIETENBERG, *supra* note 163, at 212. A mobile source includes all emissions from moving sources such as motor vehicle emission. *See generally* 42 U.S.C. § 7521 (1988).

176. *See* TIETENBERG, *supra* note 163, at 7-9.

> The [emissions trading] program is implemented by means of four separate policies, linked by a common element known as the emission reduction credit. The emission reduction credit is the currency used in trading among emission points, while the offset, bubble, emissions banking, and netting policies govern how the currency can be spent.

Id. at 7.

177. *See* 51 Fed. Reg. 43,814 at 43,831 (1986).

178. *Id.* The success of the ERC program is debatable. Generally, the program is thought to be successful, but not as successful as Congress and EPA had hoped. This disappointment can be traced to administrative and bureaucratic obstacles. Daniel J. Dudek & John Palmisano, *Emissions Trading: Why is this Thoroughbred Hobbled?,* 13 COLUM. J. ENVTL. L. 217, 217-18 (1988).

> There is no dispute . . . regarding the certainty of cost savings due to emissions trading. There may be some dispute over the exact size of the cost savings. Yet by any measure, the cost savings to date are impressive . . . . [T]he aggregate saving from emissions trading is surely in excess of $500,000,000.

Id. at 233. Another article suggests that:

> The performance evaluation of emissions trading activities reveals a mixed bag of accomplishments and disappointments. The program has clearly afforded many firms flexibility in meeting emission limits. This flexibility has resulted

The ERC program provides a strong incentive for polluters to invest funds in research and development so they can reduce their emissions beyond the mandated level and sell the right to pollute to other polluters.[179] Also, unlike performance or technology standards, the ERC program is cost-effective.[180] If it is cheaper for an industry to buy ERCs than to invest in pollution technology, the program provides flexibility so that "[s]elf-interest . . . coincides with cost effectiveness."[181]

Several other market-incentive environmental regulations have been successful in encouraging development of environmentally protective technology. Such other programs include lead trading,[182] point-nonpoint source trading,[183] and voluntary water exchanges.[184]

> in significant aggregate cost savings—in the billions of dollars—without significantly affecting environmental quality. However, these cost savings have been realized almost entirely from internal trading. They fall far short of the potential savings that could be realized if there were more external trading.

Robert W. Hahn & Gordon L. Hester, *Marketable Permits: Lessons for Theory and Practice,* 16 ECOLOGY L.Q. 361, 375-76 (1989). In addition, it has been shown that "although the economic gains from the program have been substantial, they have fallen far short of their potential . . . [and] environmental quality appears to be largely unaffected by the use of emissions trading." Robert W. Hahn & Gordon L. Hester, *Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program,* 6 YALE J. ON REG. 109, 110 (1989).

179. *See id.* at 110 n.5.

180. *See* TIETENBERG, *supra* note 163, at 16.

181. *Id.*

> The reason emission reduction credits can result in a cost-effective allocation is quite straightforward. Plants have very different costs of controlling emissions. When credits are transferable, those plants that can control most cheaply find it in their interest to control a higher percentage of their emissions because they can sell the excess. Buyers for these reductions can be found whenever it is cheaper to buy emission reduction credits for use at a particular plant than to install more control equipment. Whenever an allocation of control responsibility is not cost effective, further opportunities for trade exist. When all such opportunities have been fully exploited, the allocation is cost effective . . . . By exploiting the flexibility inherent in emissions trading to lower their own costs, within the boundaries established by the control authority, individual sources lower the total costs incurred by all sources collectively.

Id.

182. *See* 40 C.F.R. § 80.20(d) (1993); Control of Lead Additives in Gasoline, 38 Fed. Reg. 33,733 (1973). *See* Hahn & Stavins, *supra* note 7, at 17. Lead trading involved the inter-refinery trading of credits. If a refiner manufactured gasoline with a lead content that was lower than the prescribed standard, then that refiner would be issued credits. These credits then could be traded. The program was designed to give refiners the necessary flexibility at a time when the lead content in gasoline was dramatically reduced. Overall, the program was successful in meeting its goals. *Id.*

183. *See generally* Bartfeld, *supra* note 9. Point-nonpoint source trading provides point sources with incentives to fund nonpoint source pollution control, in order to meet requisite water

Such economic incentives, however, do not provide solutions to every problem. For example, market-oriented approaches work best when there is a national pollution problem and command-and-control regulations are most effective with regional or local pollution problems.[185] Therefore, regulators should never disregard incentive-based regulations.

C. A Framework for Implementing Economic Incentives

The lessons learned from successful market-incentive programs can be used to develop a workable removal credit program. For example, eight basic guidelines govern the effectiveness and success of transferable rights programs.[186] The guidelines are as follows: (1) legal authority to institute and enforce the program must exist within the administering agency; (2) the agency must have the technical capability to effectuate the program; (3) "the program must be *evasion proof*. A single body should have exclusive control over all use of the resource in the region, and use of the transferable rights should be the only way to exceed the resource use limits that otherwise apply;"[187] (4) the objectives of the program must be clearly identified; (5) the impact of the pollutant at issue should have some regional significance; (6) the resource problem must have economic value; (7) there must be a system to govern the transfer of

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quality standards within a given watershed. *See id.* at 46, 60-61. Point sources can channel money into nonpoint source controls instead of into expensive treatment upgrades. *Id.* This program has not yet been implemented. Therefore, it remains to be seen whether point-nonpoint source trading can provide a cheaper way to improve water quality. *See id.* at 82-86, 103. *See also* Hahn & Stavins, *supra* note 7, at 18.

184. Hahn & Stavins, *supra* note 7, at 18-19. Voluntary water exchanges occur between areas experiencing water supply problems and areas which have an abundance of water. The program provides incentives for water conservation since market forces may dramatically increase the price of water. Currently, there is one approved water swap in Southern California and several other states such as Arizona, Colorado, Nevada, New Mexico and Utah have expressed interest in the program. *Id.* at 19.

185. *See* Hahn & Stavins, *supra* note 7, at 14-15.

> No single approach will be ideal for all problems. The real challenge is to identify the right policy for each specific situation. The best set of policies will typically involve a mix of market and more conventional regulatory processes. Design and implementation of improved policies will require policymakers to adapt, rather than abandon, present programs. Previous experience with the use of market-based incentives in the U.S. and in other industrialized nations offers useful guidance.

Id. at 15.

186. Tripp & Dudek, *supra* note 16, at 374-77.

187. *Id.* at 375.

rights; and (8) the transfer of these rights must occur with only a minimal transaction cost.[188]

Although the removal credits program is not a strict transferable rights program, there are such elements within the program intended to function similarly to economic incentives. For example, the program does attempt to use economic incentives by encouraging industry contribution to POTWs.[189] However, as demonstrated from the history of removal credits, the program has not been very successful. Part of its failure, as previously discussed, can be contributed to the many reasons for POTW noncompliance.[190] However, the removal credit program's failure is also due to inadequate application of economic incentives and overreliance on the traditional command-and-control approach. In light of the eight guidelines previously discussed, and the history of the program, the success of the removal credit program, as currently implemented, is questionable.[191] For example, it seems as though the second, sixth and seventh elements of these guidelines are missing.[192] The technical capability to design and implement the removal credit program might exist, but it is not effectively being used. The POTWs failure to function properly is itself an impediment to the removal credit program. In addition, the incentives that are used are not set up as effectively as possible. For example, the program fails to provide a great enough incentive for industry to invest in POTW operation and maintenance. Possibly with more attention given to market-based approaches, industries can be given such incentives. While it is

188. *Id.* at 374-77.

189. *See infra* notes 196-98 and accompanying text. The program has failed to create a great enough incentive to compel industries to invest in POTW control technology. Perhaps this is because industries question whether the removal credit program is workable. *See, e.g.,* National Ass'n of Metal Finishers v. EPA, 719 F.2d 624, 649 (3d Cir. 1983), *rev'd on other grounds sub nom.* Chemical Mfrs. Ass'n v. Natural Resources Defense Council, Inc., 470 U.S. 116 (1985). Therefore, industries are reluctant to invest in a project that might fail. In addition, perhaps the trouble-ridden history of the removal credit program deters industrial investment.

190. *See supra* part IV.B.

191. Removal credits are "theoretically available," but whether they can legally be made available is unknown. Telephone Interview with David Sandalow, Environmental Protection Agency, Office of General Counsel, Office of Water (Feb. 8, 1994).

192. As noted previously, it is uncertain whether POTWs have the technological capabilities or funds to achieve these capabilities. (Factor #2). In addition, it is also uncertain whether EPA can implement the removal credit program in a cost-effective manner. (Factor #6). Furthermore, the system governing the removal credit program has not had a particularly positive history and may have a dubious future. Specifically, the removal credit program might again be suspended if EPA's sludge requirements are found inadequate. (Factor #7). *See* Sierra Club v. EPA, 992 F.2d 337, 342 (D.C. Cir. 1993).

inappropriate to suggest that Congress implemented the removal credit program in the same manner as the ERC program, perhaps the removal credit program should adopt some elements from the transferable rights programs in order to function more effectively.

VI. ALTERNATIVE APPROACHES TO THE REMOVAL CREDIT PROGRAM

A public policy argument against the current removal credit program centers around the allocation of costs. Industries that are granted removal credits are relieved of the responsibility of pretreating for certain pollutants as long as the POTW can adequately treat the pollutant.[193] Although the program is more complex than this sketch, certain checks and pre-requisites exist which could save money for industrial dischargers who receive removal credits.[194] As long as the POTWs sufficiently treat industrial discharges, indirect dischargers do not have to install expensive treatment technology which would otherwise be required. Therefore, when the POTW grants removal credits to an indirect discharger, the POTW, rather than the industry itself, treats the discharge for industrial toxics. Even though the POTW will treat for these toxic pollutants whether or not industrial dischargers receive removal credits, the granting of credits still relieves indirect dischargers from substantial obligations. It seems ineffective and inappropriate for public facilities operating on funds collected through municipal taxes[195] to have to treat toxic pollutants generated by industries while the industries themselves have no responsibilities to the wastes that they generate.[196] POTWs are more expensive to run than are pretreatment

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193. *See supra* notes 49-52 and accompanying text.

194. *See* Gold, *supra* note 37, at 501-02.

195. While originally POTW construction costs and operational costs were met with federally funded monies from the Construction Grant Program, the program has been phased out and replaced by the State Revolving Fund Program. Now most of the POTW costs are met from funds obtained by municipal taxes. Telephone Interview with David Sandalow, *supra* note 6.

196. Part of this harm is caused by what economists describe as "externalities." This harm is caused because environmental resources such as clean water are unpriced and, therefore, remain outside the market. The use of these resources is not accurately reflected in the market. The harm arises since "the burden of the resources consumed falls on society at large, not just on the user who actually consumes them." FREDERICK R. ANDERSON ET AL., ENVIRONMENTAL IMPROVEMENT THROUGH ECONOMIC INCENTIVES 3-4 (1977). Generally, the notion that the polluter must pay for the social costs of his harmful activity is espoused by environmentalists. But, it has been suggested that

> it is wrong to think in terms of one party causing harm to another. . . . [T]he problem is bilateral rather than unilateral because externalities arise when two parties, whose resource users are incompatible with each other, compete for the

programs within the industries themselves.[197] So, from the viewpoint of municipalities, the removal credit program is very ineffective and inefficient.

One solution may be to mandate that indirect dischargers which receive removal credits reimburse the POTWs for a percentage of the savings they receive. Perhaps industrial sources that invest in POTW technology could receive more credits than other sources, assuming of course that the POTW's effluent discharges do not violate the Clean Water Act.

If POTWs functioned properly, the removal credit program could be a success. In order to assist POTWs, industry must have a greater incentive to cooperate with and invest in the POTWs. Although it already is to the advantage of industry to ensure that POTWs comply with the Clean Water Act so removal credits can be granted, the existing incentive needs to be stronger so that the removal credit program can be a working reality.

VII. CONCLUSION

There can be little argument that the removal credit program has not achieved the success that regulators had hoped for. Initially, the problem seemed to be one of fine-tuning definitions and requirements that POTWs and indirect dischargers needed to meet. After *NRDC,* however, it became apparent that the removal credit program was ridden with problems that were difficult to correct. As a result, removal credits were made unavailable until the errors were remedied. Finally, EPA issued the last corrective guideline, the sludge use and disposal regulations, and it seemed as though removal credits would be a working reality. Unfortunately, this has not happened.

A major step towards the realization of the program would be POTW compliance with Clean Water Act effluent limits. In order for this to occur, additional funds and resources are necessary. Sewage treatment must become a higher priority to communities. Industries must have an incentive to assist POTWs in attaining the requisite effluent standards.

> right to use the same resource. . . . [C]ompeting parties are likely to negotiate an efficient allocation of resources, if expensive litigation can be avoided.

FREDERICK R. ANDERSON ET AL., ENVIRONMENTAL PROTECTION: LAW AND POLICY 36 (1990) (citing Ronald Coase, *The Problem of Social Cost,* 3 J.L. & ECON. 1 (1960)).

197. *See* Kellman, *supra* note 108, at 791.

Economic incentives, in addition to more traditional command-and-control regulations, might enable regulators and municipalities to achieve this goal. The lessons of past environmental experiences with economic-based regulations can be used as a tool for fixing the removal credit program.

KAREN M. RIMMELE