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ENJOY THE DONUT: A REGULATORY RESPONSE TO *THE WHITE PAPER* ON PREVENTING INVASION OF THE GREAT LAKES BY EXOTIC SPECIES

Sandra B. Zellmer*

"The success of technology-based standards in abating toxic water pollution depends largely on one's predisposition to enjoy the donut or regret the hole."¹

INTRODUCTION

The adverse economic and environmental consequences associated with the invasion and establishment of exotic species have raised significant concerns among the Great Lakes community. In September 1999, the International Joint Commission (IJC) hosted a workshop on exotic policy, drawing upon the expertise of biologists, lawyers and public officials, to consider means of preventing exotic species invasions. The *White Paper on Policies for the Prevention of the Invasion of the Great Lakes by Exotic Organisms*² served as the centerpiece for discussion at the workshop.

The *White Paper* concludes that economic initiatives, such as subsidies or taxation, would be the most viable way to prevent introductions through ballast water, a primary means for invasion by exotic species in the Great Lakes. This article suggests instead that regulation under the Clean Water Act (CWA) is an effective solution, at least with respect to ships traversing United States waters.³ Not only is federal regulation required under the plain language of the CWA, it

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1. Oliver A. Houck, *Clean Water Act and Related Programs*, CA37 ALI-ABA 295, 310 (1996).

2. Eric Reeves, *White Paper on Policies for the Prevention of the Invasion of the Great Lakes by Exotic Organisms* (July 15, 1999). Where possible, cites are also provided to Eric Reeves' revised document published in this symposium issue, *Exotic Politics: An Analysis of The Economics, Law, and Politics of Exotic Invasions of The Great Lakes*, 2 TOL. J. GREAT LAKES' L., SCI. & POL'Y 125 (Fall 1999).

3. As aquatic species do not respect political boundaries, introductions through ballast water on the Canadian side of the border can have serious effects in the United States. This article, however, is limited to an assessment of U.S. domestic law, in particular, the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, as well as the U.S.-Canada Great Lakes Water Quality Agreement.

could most expediently address the invasion of exotics through ballast water discharges.

The U.S. Environmental Protection Agency (EPA), however, has issued a regulatory exclusion for "incidental" ballast water discharges. This exclusion, which has been challenged by a coalition of environmental groups, finds no support in the statute. Under the CWA, contaminated ballast discharges from vessels are prohibited as "discharges of pollutants" from point sources, unless a permit is obtained. Ballast water discharge permits would incorporate effluent limitations reflecting the best technology available, a marked improvement over the status quo. Once a threshold level of treatment is established by the CWA, perhaps economic initiatives could provide additional incentives for compliance and technological innovation.

To put the issues in context, this article will first provide background regarding the effects of exotic species introduced into the Great Lakes through ballast water as well as current legal controls. It will then turn, in Section II, to the relevant sections of the CWA and the federal regulations. Section III explains the advantages of a regulatory permit system, particularly in comparison to economic approaches. Finally, Section IV assesses the practical implications of implementing the CWA permit system to control ballast water discharges.

I. EXOTIC SPECIES DISCHARGED WITH BALLAST WATER: EFFECTS AND CURRENT CONTROL EFFORTS

Exotic species have taken a heavy toll on United States' ecosystems. The *White Paper* and numerous other scientific and legal publications provide detailed assessments of the adverse consequences of exotic species' invasions in the Great Lakes, particularly those resulting from ballast discharges.⁴ To set the stage for the discussion of regulatory options, this article will outline some of the more serious effects.

The rate of invasion by exotic species "poses an increasing global threat to native biodiversity, ranked second only to habitat loss."⁵ Exotic species have made a significant contribution to the decline of indigenous species in the Great Lakes.⁶ The sea lamprey, for example, predatedes directly on native fish, such as

4. See Reeves, *White Paper*, *supra* note 2, at 6-13. See also Interim Rule, Implementation of the National Invasive Species Act of 1996, 64 Fed. Reg. 26672, 26673 (1999) ("aquatic nuisance species invasions through ballast water are now recognized as a serious problem threatening global biological diversity and human health").

5. John J. Ewel, et al., *Deliberate Introductions of Species: Research Needs*, 49 BIOSCIENCE 619, 620 (1999). See 64 Fed. Reg. at 26673. See also David S. Wilcove, et al., *Quantifying Threats to Imperiled Species in the United States*, 48 BIOSCIENCE 607-15 (1998) (stating that exotics pose a serious threat to native species listed as federally endangered or threatened).

6. See Proposed Water Quality Guidance for the Great Lakes System, 58 Fed. Reg. 20802, 20807 (1993). Native fisheries have also been adversely affected by over-fishing, pollution, and habitat destruction. See *id.*

lake trout, walleye and whitefish.⁷ Other exotic species affect Great Lakes' fisheries by competing for food and habitat, and by introducing disease and parasites.⁸

Exotic species also cause a variety of economic harms. Declining fisheries are but one source of loss. The highly fecund zebra mussel (*Dreissena polymorpha*) is estimated to cost between \$3 to \$5 billion a year nationwide, in large part due to the expenses incurred by power plants to clear and maintain clogged intake pipes.⁹ Total losses caused by fifteen selected nonindigenous aquatic species, including zebra mussel and the purple loosestrife plant (*Lythrum salicaria*), have been estimated at over \$134 billion.¹⁰

Ballast water is one of the primary vectors for the introduction of exotic species into Great Lakes waters.¹¹ Vessels generally pump ballast water into tanks to replace the weight of off-loaded cargo or expended fuel, thereby improving vessel stability in transport.¹² The zebra mussel is perhaps the most well-publicized of the invaders attributed to ballast water discharges. Others include the Eurasian ruffe (*Gymnocephalus cernuus*),¹³ the spiny water flea (*Bythotrephes cederstroemi*), and even human bacterial pathogens such as cholera.¹⁴

The discharge of ballast from commercial ships was virtually unregulated until the early 1990's, when regulations were issued pursuant to the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA)¹⁵, as amended

7. See Great Lakes Fishery Commission, *Sea Lamprey Control*, (visited Dec. 20, 1999) <<http://www.glfc.org/lampcon.htm>>.

8. See Eric Reeves, *Analysis of Laws & Policies Concerning Exotic Invasions of the Great Lakes: A Report to the Michigan Department of Environmental Quality* at 8-9 (Mar. 15, 1999) (on file with author); Glenn Zorpette, *Mussel Mayhem Continued: Apparent Benefits of Zebra Mussel Plague Are Anything But*, 275 SCI. AM. 2: 22-23 (August 1996).

9. See 16 U.S.C. § 4701(4). The zebra mussel attaches to water pipes, thereby restricting water flow for cooling and increasing sedimentation and corrosion, resulting in significant maintenance, plant redesign, and shut-down expenses. See Zorpette, *supra* note 8, at 22-23; OFFICE OF TECHNOLOGY ASSESSMENT, *HARMFUL NON-INDIGENOUS SPECIES IN THE UNITED STATES* 67 (1993).

10. See Sharonne O'Shea & Allegra Cangelosi, *Trojan Horses in Our Harbors: Biological Contamination from Ballast Water Discharge*, 27 U. Tol. L. Rev. 381, 382-85 (1996); OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 9, at 6.

11. NATIONAL RESEARCH COUNCIL MARINE BOARD, *STEMMING THE TIDE: CONTROLLING INTRODUCTIONS OF NONINDIGENOUS SPECIES BY SHIP'S BALLAST WATER* 11 (1996).

12. See *id.* at 22.

13. The Eurasian ruffe, which has become one of the most abundant fish of Lake Superior's harbors, eats the forage of native species. See 142 CONG. REC. H10925 (daily ed. Sept. 24, 1996) (Statement of Rep. Oberstar). If the ruffe is not controlled, the Great Lakes Fishery Commission estimates that it could cause annual losses exceeding \$90 million. See David Eldridge, *Leviathan Lurks: Might The National Invasive Species Act of 1996 Actually Authorize Invasion by Proscribed Species?*, 6 S.C. ENVTL. L.J. 47, 47 n.6 (1997).

14. See International Maritime Organization Ballast Water Control Guidelines, 56 Fed. Reg. 64831, 64831 (Dec. 12, 1991); O'Shea & Cangelosi, *supra* note 10, at 383-84 and n.3, 20-22 (1996) (citing, *inter alia*, Edward L. Mills et al., *Exotic Species in the Great Lakes: A History of Biotic Crises and Anthropogenic Introductions*, 19 J. GREAT LAKES RES. 1, 2-4 (1993)).

15. 16 U.S.C. §§ 4701-4751, as amended by NISA of 1996, 16 U.S.C. §§ 4701-4751.

in 1996 by the National Invasive Species Act (NISA).¹⁶ Under NISA, vessels must exchange their ballast at sea before entering the Great Lakes,¹⁷ but the statute does not specify federal requirements for the "purity" of ballast water released. Instead, Coast Guard regulations set a salinity standard of at least 30 parts per thousand (ppt).¹⁸ Although there is no evidence that 30 ppt salinity acts as an effective biocide, it presumably indicates that an ocean exchange of approximately 85% of water by volume occurred.¹⁹ However, even if 85% were considered an adequate exchange, many foreign flag vessels pipe salt water into their ballast tanks before they leave their home port and they may enter Great Lakes waters with a salinity factor equal or higher than 35.3 ppt, the ocean's salinity.²⁰ In addition, evaporative losses during a trans-Atlantic voyage tend to increase salinity in the tank.²¹ Given these variables, the salinity test provides no guarantee that an adequate ocean exchange occurred.

There are broad-sweeping exemptions in NISA which further undermine the exchange requirements. First, exchange can be avoided on the grounds of ship safety, left almost entirely to the captain's discretion.²² Safety reasons can include "vessel architectural design" or "other extraordinary circumstances."²³ Accordingly, a captain who sails a poorly designed ship, or, arguably, even a ship with an inexperienced crew or one sailing under a tight schedule, can avoid ballast exchange. Ships that fail to accomplish an exchange outside of the exclusive economic zone must employ another method of ballast water management before entering the Great Lakes,²⁴ or request the Coast Guard's permission to exchange ballast water in an alternative designated area.²⁵

Further, NISA does not require the treatment of residual sediments and slop in the tanks of ships fully loaded with cargo, also known as "no ballast on board", or NOBOB, vessels.²⁶ While fully loaded, the residue in a ship's ballast water tanks is unpumpable;²⁷ yet, residual sediments and slop can support aquatic life forms, which subsequently will be mixed with ballast water pumped into the tanks.

16. 16 U.S.C. §§ 4701-4751. See O'Shea & Cangelosi, *supra* note 10, at 383.

17. 16 U.S.C. § 4711. Although this article is limited to United States law and policy, the Canadian Shipping Act provides an interesting comparison. Instead of specific prohibitions and exceptions regarding ballast water exchange, that Act, as amended in 1998, simply provides that "[t]he Governor in Council may make regulations respecting the control and management of ballast water." R.S.C., RS-9, § 657.1. Unlike NISA, it appears that this Act allows the adoption of control measures beyond mere ballast exchange. See Reeves, *supra* note 8, at 67.

18. 33 C.F.R. § 151.1510(a)(1).

19. See Reeves, *supra* note 8, at 57.

20. See *id.*

21. See *id.*

22. See 16 U.S.C. § 4711(k)(1).

23. See 16 U.S.C. § 4711(k)(1).

24. See 33 C.F.R. § 151.1510.

25. See 16 U.S.C. § 4711(k)(2)(A),(B); 33 C.F.R. § 151.1514. The exemption sweeps even more broadly for ships traversing U.S. waters other than the Great Lakes. These ships may avoid exchange on safety grounds and proceed to discharge water "in any harbor." *Id.*

26. See Reeves, *supra* note 8, at 54-55.

27. See *id.* at 54.

As a result, NISA is largely ineffective for preventing exotic species invasions.

II. THE CWA'S APPLICATION TO BALLAST WATER DISCHARGES FROM VESSELS

The CWA prohibits the "discharge of any pollutant by any person," unless a National Pollution Discharge Elimination System (NPDES) permit is obtained.²⁸ The "discharge of a pollutant" is defined, in relevant part, as "any addition of any pollutant to navigable waters from any point source."²⁹ Navigable waters include all surface waters of the United States, including lakes, rivers and streams, wetlands, and the territorial seas, extending seaward from the coast for a distance of three miles.³⁰

Pollutants are added to United States waters from a point source when ballast water containing exotic species is pumped from vessels. Yet, the Environmental Protection Agency (EPA), by regulation, excludes ballast water discharges from the NPDES program: "The following discharges do not require NPDES permits: (a) Any discharge of sewage from vessels, effluent from properly functioning marine engines, laundry, shower, and galley sink wastes, or any other discharge incidental to the normal operation of a vessel."³¹ The Pacific Environmental Advocacy Center and other groups petitioned EPA for the repeal of its regulation in January 1999.³² In response, EPA acknowledged that ballast water could be covered by CWA's prohibition on point source discharges, and stated that it would prepare a report to "explore options" for regulating ballast water by September 1, 1999.³³ However, no official report or proposed rule has been issued to date. Once EPA makes a final determination, it could be subject to a citizen suit under the CWA.³⁴

28. CWA § 301(a), 33 U.S.C. § 1311(a).

29. CWA § 502(12), 33 U.S.C. § 1362(12).

30. CWA § 502(7)-(8), 33 U.S.C. § 1362(7)-(8). *See United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121 (1985) (upholding the regulatory definition of navigable waters).

31. 40 C.F.R. § 122.3(a).

32. Letter from Pacific Environmental Advocacy (PEAC) to Carol Browner (Jan. 13, 1999) (on file with author).

33. Letter from Asst. Administrator Charles Fox to Craig N. Johnston, PEAC (Apr. 6, 1999) (on file with author).

34. *See* CWA § 505(a)(2), 33 U.S.C. § 1365(a)(2) ("any citizen may commence a civil action... against the Administrator [of EPA] where there is alleged a failure . . . to perform any act or duty under this chapter which is not discretionary with the Administrator."); *Natural Resources Defense Council v. Costle*, 568 F.2d 1369 (D.C. Cir. 1977) (requiring EPA to regulate agricultural return flows as point sources). *See also* Section III.D., *infra* (discussing citizen suits).

A. *Exotic species are pollutants*

The language of the statute, as well as its objectives and its legislative history, support the inclusion of exotic "pollutants" into the regulatory program.³⁵ The term pollutant, as used in the CWA, means heat and a variety of substances, such as garbage, solid waste, sewage, chemical wastes, and, most importantly here, biological materials.³⁶ Although the definition of pollutant in the CWA is not so broadly phrased as to be considered all-inclusive,³⁷ courts have construed it to encompass substances not specifically enumerated but subsumed under the listed, more general terms.³⁸ Thus, fish and other organisms – alive, in various life stages, or dead – are included under the term "biological materials," and are therefore pollutants under the CWA.³⁹ By way of analogy, pathogens in sewage treatment plant effluent are undoubtedly biological pollutants, which may not be discharged in navigable waters without a permit.⁴⁰

Courts have, however, deferred to EPA's determination that NPDES permits are not required when fish and fish parts are moved through a waterbody via dams, because there is no "addition" of pollutants from dams; the fish do not come from the "outside world" but instead originate within the same ecosystem.⁴¹ Similarly, EPA's decision that the transfer of cold water from an impounded reservoir through a dam to the receiving stream or river is not an "addition" of a pollutant has been upheld.⁴² By contrast, seafood processing plants that remove fish and then process and discharge the fish wastes into receiving waters of the

35. See David Whalen, *The Control of Aquatic Nuisance Nonindigenous Species*, 5 ENVTL. LAW. 65, WL *10-12, 26-27 (1998) (reviewing legislative history of the CWA and determining that the definition of pollutants should include living aquatic invasive species); Reeves, *White Paper*, *supra* note 2, at 6 (agreeing that exotic species are pollutants, as a matter of law, economics and common sense). See also David Eldridge, *supra* note 13, at 49.

36. CWA § 502(6), 33 U.S.C. § 1362(6).

37. See Nat'l Wildlife Fed'n v. Gorsuch, 693 F.2d 156, 175-76 (D.C. Cir. 1982) (finding in dicta that cold, unlike heat, is a water condition; because cold is not specifically listed, while heat is, cold is not necessarily a pollutant).

38. See United States v. Hamel, 551 F.2d 107 (6th Cir. 1977) (affirming the district court's decision that petroleum products are included under the broad term "chemical waste," even though Congress did not list oil and oil products by name within the definition of pollutant). See also Hudson River Fishermen's Ass'n v. City of New York, 751 F. Supp. 1088, 1101 (S.D.N.Y. 1990) (holding that chlorine, when discharged into navigable waters, is regarded as a pollutant, though intended for a beneficial use), *aff'd*, 940 F.2d 649 (2d Cir. 1991).

39. See Nat'l Wildlife Fed'n v. Consumers Power Co., 862 F.2d 580 (6th Cir. 1988). See also United States v. Dubois, 102 F.3d 1273, 1296-97 & n.29 (1st Cir. 1996) (finding that movement of organisms in river water to a pond is an addition of pollutants; although defendant's snowmaking did not itself contribute new pollutants, it was undisputed that the river contained at least some pollutants not found in the pond, including the parasitic *giardia lamblia*); Ass'n of Pacific Fisheries v. EPA, 615 F.2d 794, 807 n.7 & 815 (9th Cir. 1980) (concluding that fish wastes discharged from seafood processors are pollutants).

40. See U.S. v. Frezell, 461 F. Supp. 266, 269-70 (E.D. Pa. 1978) (holding that bacteria in compost runoff is a biological material and therefore a pollutant), *aff'd*, 602 F.2d 1123 (3d Cir. 1979), *cert. denied*, 444 U.S. 1074 (1980).

41. See *Consumers Power*, 693 F.2d at 584-86.

42. See *Gorsuch*, 693 F.2d at 156.

United States are adding pollutants.⁴³

The EPA has recognized that exotic species are pollutants in a variety of other contexts. For example, in proposing Total Maximum Daily Load (TMDL) regulations for drinking water contaminants, EPA stated that "all microbial contaminants that may be discharged to waters of the U.S. (e.g., bacteria, viruses and other organisms) fall under the term 'biological materials.'"⁴⁴ In addition, EPA implicitly acknowledged that invasive species contribute to water quality impairment when it approved California's list of 472 impaired waters, including those listed as impaired because of the presence of invasive species.⁴⁵

B. *Vessels are point sources*

Vessels which discharge ballast water into waters of the United States are expressly included in the CWA's definition of a "point source." The term is defined broadly as "any discernible, confined and discrete conveyance, including but not limited to any pipe . . . or vessel or other floating craft, from which pollutants are or may be discharged."⁴⁶ The definitional section excludes only "agricultural stormwater discharges and return flows from irrigated agriculture."⁴⁷

Although agency interpretations of a statute under its administration are generally given deference, interpretations which fly in the face of explicit mandates of the statute, such as EPA's regulatory exclusion of ballast, must be set

43. See 40 C.F.R. Part 408; *Pacific Fisheries*, 615 F.2d at 801. Similarly, the discharge of dredged-up sediments and debris, although indigenous materials at their place of origin, adds pollutants when introduced to another area. See *United States v. M.C.C. of Florida, Inc.*, 772 F.2d 1501, 1506 (11th Cir. 1985), *vacated on other grounds*, 481 U.S. 1034 (1985), *reh'g on other grounds*, 863 F.2d 802 (1989); *United States v. Banks* (S.D. Fla. 1995); *United States v. Zaner* (N.D. Cal. 1991).

44. Proposed Revisions to the Water Quality Planning and Management Regulation, 64 Fed. Reg. 46012, 46017 (1999). See CWA § 303(d), 33 U.S.C. § 1313(d) (requiring the identification of impaired waters and establishment of TMDLs); discussion at Section III.C *infra* (discussing TMDL program).

45. See 63 Fed. Reg. 59556 (1998); Brent Foster, *Pollutants Without Half-lives: The Role of Federal Environmental Laws in Controlling Ballast Water Discharges of Exotic Species*, 30 ENVTL. L. at 18 (2000). See also L. Blaney & T. Kemp, WATER RESOURCES CONTROL BOARD, 15-SUM CAL. REG. L. REP. 149, 150 (noting that an objective of California's Plan is to reduce the impacts of introduced species on native species in the San Francisco Bay/Delta Estuary).

46. CWA § 502(14), 33 U.S.C. § 1362(14) (emphasis added).

47. *Id.* In addition, a limited exemption for stormwater runoff from mining activities is found outside of the definitional section. See CWA § 402(l)(2), 33 U.S.C. § 1342(l)(2).

aside.⁴⁸ "[T]echnological or administrative infeasibility of [uniform national effluent] limitations may result in adjustments in the permit programs . . . but it does not authorize the Administrator to exclude the relevant point source from the NPDES program."⁴⁹

Not only is the regulation inconsistent with the plain language of the CWA's "point source" definition, it undermines the CWA's straightforward and ambitious objectives.⁵⁰ The CWA is intended to restore and maintain the chemical, physical, and *biological* integrity of waters of the United States,⁵¹ and to ensure water quality supports fisheries and other designated uses, such as recreation.⁵² There is no dispute that invasive species, no less than other pollutants, have had tremendous effects on Great Lakes' water quality and native biodiversity.

Moreover, neither the legislative nor the regulatory history supports the exclusion of ballast water discharges. The legislative history of the CWA specifies that *all* discharges to waters of the United States, the contiguous zone and the ocean "were to be regulated by EPA under one Act or the other."⁵³ The Committee on Public Works and Commerce intended "complete and integrated regulation of the disposal of pollutants *into all waters and over all sources of pollutants subject to its jurisdiction.*"⁵⁴

48. See *Natural Resource Defense Council, Inc. v. Costle*, 568 F.2d 1369 (D.C. Cir. 1977) (invalidating EPA's exclusion for agricultural return flows as inconsistent with the plain language of section 502(14); Congress later amended that provision to explicitly exclude return flows); *Chevron USA, Inc. v. Natural Resources Defense Council, Inc.* 467 U.S. 837 (1984) (holding that courts reviewing statutory interpretations by agencies should first determine whether the statute is ambiguous; if it is not, the court may not defer to the agency, but must give effect to the plain meaning of the statute). See also *Chevron v. Hammond*, 726 F.2d 483, 488 (9th Cir. 1984) (upholding Alaska's application of the permit system to oil-tainted ballast water discharged from vessels, noting that the CWA provided only limited exemptions to the otherwise comprehensive NPDES program).

49. *Costle*, 568 F.2d at 1379.

50. See *Hammond*, 726 F.2d at 493 (finding that CWA's objectives support Alaska's application of the NPDES program to ballast water).

51. CWA § 101(a), 33 U.S.C. § 1251(a) (emphasis added).

52. CWA § 101(a)(2), 33 U.S.C. § 1251(a)(2).

53. See 44 Fed. Reg. 32859 (1979) (citing SENATE COMMITTEE ON PUBLIC WORKS, 93d Cong., 1st Sess. (1973) at 1492 (referencing the CWA and the Marine Sanctuaries Act, 16 U.S.C. § 1431, *et seq.*)). The Ocean Dumping Act (ODA) compliments the CWA with regard to emissions outside of the CWA's jurisdiction, as it prohibits vessels registered in the United States or flying a United States flag from transporting "any material for the purpose of dumping it into ocean waters." 33 U.S.C. § 1411(a)(2). The ODA also prohibits any person from dumping "any material transported from a location outside the United States" into United States territorial seas, or the U.S. contiguous zone if it may affect U.S. territorial seas or territory, unless a permit is obtained. 33 U.S.C. § 1411(b). The United States claims a contiguous zone of twelve miles from its baseline. See, e.g., 33 U.S.C. § 1402(b); 19 U.S.C. § 1401(j). See also Pres. Proclamation No. 5928 (Dec. 27, 1988); 54 Fed. Reg. 777 (1989). In addition, nations may generally exercise jurisdiction over foreign flag vessels that violate its customs, fiscal, immigration, or sanitary laws if the vessels are traveling within their contiguous zone. See United Nations Convention on the Law of the Sea, art. 33, 21 I.L.M. 1261 (Dec. 10, 1982).

54. 44 Fed. Reg. 32859, (citing SENATE COMMITTEE ON PUBLIC WORKS, 93d Cong., 1st Sess. (1973) at 1492 (emphasis added)).

The regulatory history of section 122.3 indicates that EPA may not have intended ballast water discharges to be excluded when the regulation was first issued in 1973. The provision as originally proposed in the federal register excluded only "discharges from properly functioning marine engines."⁵⁵ The final provision was extended to "discharges incidental to the normal operation of a vessel," but it did not cover trash discarded overboard or discharges from vessels acting in a capacity other than transportation, "such as when a vessel is being used as a storage facility or a cannery."⁵⁶ EPA's explanation indicates that the exclusion for incidental discharges was meant to apply to recreational boats, not commercial vessels: "This type of discharge generally causes little pollution and the exclusion of vessel wastes from the permit requirements will reduce administrative costs dramatically."⁵⁷

Other provisions of the CWA provide support for treating ballast discharges as point sources subject to the NPDES program. First, statutory amendments enacted in 1996 exclude incidental discharges from military vessels from the definition of pollutant.⁵⁸ Although Congress expressly noted that "[v]essels are point sources of pollution" under the CWA,⁵⁹ it believed that an alternative program was desirable for the military, given the operational problems experienced by the Navy when various coastal states attempted to impose inconsistent regulatory requirements or inspection programs on naval vessels.⁶⁰ Thus, instead of obtaining NPDES permits to discharge their ballast water, military vessels must comply with another new provision, section 312(n),⁶¹ which requires on-board marine pollution control devices if such devices are reasonable and practicable.⁶² This exclusion provides at least some evidence that Congress intended for incidental discharges, like ballast water, from non-military vessels to be included in the NPDES program. Generally, an explicit exclusion of one activity negates an implied exclusion of another type of

55. 38 Fed. Reg. 1363-1364 (1973). See Daniel E. O'Toole, *Regulation of Navy Ship Discharges Under the Clean Water Act: Have Too Many Chefs Spoiled the Broth?*, 19 WM. & MARY ENVTL. L. & POL'Y REV. 1, 12-13 (1994) (discussing history of EPA's ballast water exemption).

56. 40 C.F.R. § 125.4(c), See 38 Fed. Reg. 13528, 13530 (1973). See also 44 Fed. Reg. 32859 (1979) (stating that, although the CWA does not define "vessels or other floating craft, it appears that those terms refer to transportation vessels").

57. 38 Fed. Reg. 13,528 (1973). Similarly, the legislative history of the CWA indicates that Congress believed that permitting for millions of recreational boats would have been an "unreasonable expenditure of administrative effort" as well as an "unreasonable burden on the individual boat owners." See O'Toole, *supra* note 55, at 12-13 (citing 118 CONG. REC. 16,875-76 (1972)).

58. See Uniform National Discharge Standards for Armed Forces Vessels Act, CWA § 502(6), 33 U.S.C. § 1362(6).

59. S. REP. NO. 113, 104th Cong., 1st Sess. (S. REP. NO. 104-113), at 1.

60. S. REP. NO. 104-113, at 1, 7.

61. CWA § 312(n), 33 U.S.C. § 1322(n); See 40 C.F.R. Part 1700.

62. See CWA § 312 (n)(1),(2), 33 U.S.C. § 1322(n)(1), (2). See also discussion, *infra*, at IV.B.

activity.⁶³

The subsequent enactment of a statutory exclusion for military vessels could, however, cut the other way. Arguably, the fact that Congress had notice that EPA was, by regulation, excluding ballast discharges from NPDES coverage, and amended the relevant provisions of the CWA with respect to military discharges only, indicates congressional approval of EPA's regulation.⁶⁴

Yet, post-enactment developments like the exclusion for military vessels cannot properly be described as legislative history, and therefore, cannot be given the weight of contemporaneous legislative reports or statements.⁶⁵ "[T]he views of a subsequent Congress form a hazardous basis for inferring the intent of an earlier one."⁶⁶

A reviewing court would likely find that the definitional provisions of CWA section 502, along with the general prohibition of section 301,⁶⁷ are clear and unambiguous, and give post-enactment legislative history little, if any, weight.⁶⁸ If the statute is plain on its face, courts need not resort to legislative history for

63. See *Andrus v. Glover Constr. Co.*, 446 U.S. 608, 618 (1980); *League to Save Lake Tahoe, Inc. v. Trounaday*, 598 F.2d 1164, 1171 (9th Cir.), cert. denied, 44 U.S. 943 (1979). See also *City of Chicago v. Env'tl. Defense Fund*, 511 U.S. 328, 338 (1994) (in refusing to imply exemption from hazardous waste regulation of the Resource Conservation and Recovery Act (RCRA), Court noted that Congress had provided a complete exemption in a separate section of RCRA by utilizing a comprehensive list of relevant activities, and therefore "knew how to draft a waste stream exemption in RCRA when it wanted to."). See also *Hammond*, 726 F.2d at 488 (noting that CWA's explicit exclusion for certain types of discharges supported inclusion of ballast water in the NPDES program).

64. "[T]he congressional failure to revise or repeal the agency's interpretation is persuasive evidence that the interpretation is the one intended by Congress." *Geldermann, Inc. v. Commodity Futures Trading Comm'n*, 836 F.2d 310, 316 (7th Cir.1987) (quoting *NLRB v. Bell Aerospace Co.*, 416 U.S. 267, 274-75 (1974)).

65. See *Redlark v. Comm'r of Internal Revenue*, 141 F.3d 936, 941 (9th Cir. 1998).

66. *Consumer Product Safety Comm'n v. GTE Sylvania, Inc.*, 447 U.S. 102, 117-19 (1980) (footnote omitted) (citing *United States v. Philadelphia Nat'l Bank*, 374 U.S. 321, 348-49 (1963) and *United States v. Price*, 361 U.S. 304, 313 (1960)); See *North Haven Bd. of Educ. v. Bell*, 456 U.S. 512 (1982) (post hoc congressional actions may be viewed as instructive as to the reasonableness of an agency's interpretation.); See *Apex Hosiery Co. v. Leader*, 310 U.S. 469, 487-89 (1940) (once an agency's statutory construction has been "fully brought to the attention of the public and the Congress," and Congress has not sought to alter it although it has amended the statute in other respects, a court may presume that the agency has correctly discerned the legislature's intent.).

67. CWA §§ 301(a), 502(6), (14), 33 U.S.C. §§ 1311(a), 1362(6), (14).

68. See *W. Va. Univ. Hosps., Inc. v. Casey*, 499 U.S. 83, 98-99 (1991) ("Where a statute contains a phrase that is unambiguous—that has a clearly accepted meaning in both legislative and judicial practice—we do not permit it to be expanded or contracted by the statements of individual legislators or committees during the course of the enactment process."); *United States v. Ron Pair Enterprises, Inc.*, 489 U.S. 235, 241 (1989) ("[W]here, as here, the statute's language is plain, 'the sole function of the court is to enforce it according to its terms.'" (quoting *Caminetti v. United States*, 242 U.S. 470, 485 (1917))); *Chevron*, 467 U.S. at 842-43 (if the statute is unambiguous on its face, the court must simply effectuate its terms instead of deferring to an agency's interpretation).

confirmation, but must give the language of the statute "its natural meaning."⁶⁹ While EPA does have some power to define technical terms like "point source" and "pollutant",⁷⁰ broad-sweeping categorical exemptions like the one for ballast discharges from commercial vessels would likely be rejected as inconsistent with the plain language of the CWA.⁷¹

A second provision of the CWA provides additional support for including ballast water discharges in the NPDES program. The CWA's definition of a "discharge of a pollutant" expressly includes discharges to the contiguous zone or the ocean "from any point source other than a vessel or floating craft."⁷² The contiguous zone is the area from three to twelve miles out to sea.⁷³ "Navigable waters" include the territorial seas, which extend seaward three miles, but not the contiguous zone.⁷⁴ Accordingly, vessels that discharge any pollutant to the territorial seas are in fact discharging pollutants from point sources.

Other statutes and executive materials support this interpretation of the CWA. NISA, enacted after the CWA, provides for the application of the CWA to ballast discharges by stating that it does "not affect or supercede any requirements or prohibitions pertaining to the discharge of ballast" under the CWA.⁷⁵ The plain language of this broadly worded savings clause confirms that the CWA may be applied to ballast water discharges in United States waters.⁷⁶

Finally, as a matter of federal policy, Executive Order 13112 directs EPA and other agencies to "use existing programs and authorities to prevent introduction of invasive species."⁷⁷ EPA not only has the authority and even the mandate to regulate ballast under CWA section 402, but executive policy states it should do so as a matter of federal prerogative.

The EPA has experience and technical expertise in controlling pollution –

69. *Morales v. Trans World Airlines, Inc.*, 504 U.S. 374, 386 n.2 (1992). See *Chevron*, 467 U.S. at 842-83; *Harrison v. PPG Industries, Inc.*, 446 U.S. 578, 591-592 (1980). The statute itself, not committee reports or other legislative statements, provides the "authoritative expression" of the law. See *Envil. Defense Fund*, 511 U.S. at 337 (holding that ash generated by resource recovery facility's incineration of municipal solid waste was subject to RCRA regulatory scheme governing hazardous waste pursuant to plain language of Section 3001(i), 42 U.S.C. § 6921(i)).

70. See *Gorsuch*, 693 F.2d at 167.

71. See *Costle*, 568 F.2d at 1375.

72. CWA § 502(12), 33 U.S.C. § 1362(12).

73. See CWA § 502(9), 33 U.S.C. § 1362(9); Convention of the Territorial Sea and the Contiguous Zone, Apr. 29, 1958, art. 33, 15 U.S.T. 1607, 1612-13, 516 U.N.T.S. 205, 220-22 (1958); 63 Fed. Reg. 45298, 45300 (1998).

74. See CWA § 502(7), 33 U.S.C. § 1362(7).

75. 16 U.S.C. § 4711(b)(2)(C), (c)(2)(J).

76. The legislative history of NISA indicates that Congress wanted to ensure that the CWA continues to govern the discharge of oily or chemical-laden ballast. See Senate Environment and Public Works Committee, S. REP. 101-523 on S.2244, at 6 (Oct. 11, 1990), 1990 U.S.C.C.A.N. 6455, 6450 (S.2244 was incorporated into H.R. 5390, which was then passed into law as the final act, P.L. 101-646 (Nov. 29, 1990)). However, there is no evidence that Congress intended to limit this provision to ballast contaminated with oil or chemicals. To read such a limitation into the statute would fail to do justice to the plain language of NISA's broadly phrased savings clause, in violation of the principle that the language of the statute itself, not the legislative statements, provides the "authoritative expression" of the law. See *Envil. Defense Fund*, 511 U.S. at 337.

77. Exec. Order No. 13112, 64 Fed. Reg. 6183 (1999).

chemical, physical and biological – under the CWA and other federal statutes. By comparison, the Coast Guard, an agency within the Department of Transportation,⁷⁸ has a wholly different statutory mission – safety on United States waters.⁷⁹ Its primary responsibilities are enforcement of federal laws on the high seas and waters subject to the jurisdiction of the United States; safety of life and property at sea; aiding navigation through activities such as ice-breaking; and readiness to function with the Navy in time of war.⁸⁰ A cooperative arrangement between EPA and the Coast Guard would be mutually beneficial in the context of ballast water discharges.

The CWA envisions working relationships between EPA and other agencies in other contexts, including the dredge and fill provisions of CWA section 404.⁸¹ There, the Army Corps of Engineers issues permits for activities that affect wetlands, while the EPA holds veto power over those permits.⁸² The Corps, together with EPA, jointly issues wetlands regulations.⁸³ Although the relationship is not always an easy one,⁸⁴ the different perspectives of the two agencies can contribute to the strength of the overall program.⁸⁵

III. THE EFFECTIVENESS OF THE NPDES PROGRAM AS A REGULATORY TOOL

The *White Paper* asserts that "serious questions" exist whether the CWA has "made any substantial contribution to the promotion of water. . . quality."⁸⁶ Citing only one somewhat dated economics text, the *White Paper* asserts that "[a]ccording to a considerable body of scholarship," the regulatory approach "has generally been a costly failure."⁸⁷

Yet, few would deny that the quality of surface waters in the United States has

78. 14 U.S.C. § 1.

79. 14 U.S.C. § 2. The Department of Transportation is generally known as a development-oriented department. See Oliver A. Houck, *Of Bats, Birds and B-A-T: The Convergent Evolution of Environmental Law*, 63 MISS. L.J. 403, 454 (1994).

80. 14 U.S.C. § 2.

81. CWA § 404, 33 U.S.C. § 1344.

82. See 40 C.F.R. § 231.1(a); *James City County, Va. v. EPA*, 12 F.3d 1330 (4th Cir. 1993), *cert. denied*, 513 U.S. 823 (1994).

83. See *Natural Resources Defense Council v. Calloway*, 392 F. Supp. 685 (D.D.C. 1975).

84. See, e.g., *Bersani v. Robichaud*, 850 F.2d 36 (2d Cir. 1988), *cert. denied*, 489 U.S. 1089 (1989) (upholding EPA veto of CWA section 404 wetland permit issued by Corps). See generally Comment, *Bersani v. EPA: Toward a Plausible Interpretation of the 404(B)(1)*.

85. See Benjamin H. Grumbles & Kenneth J. Kopocis, *The Water Resources Development Act of 1992: Expanding the "Corps of Environmental Engineers"*, 23 ELR 10379, WL *32-33 (1993) (noting that, in carrying out the CWA's goals, both Congress and the EPA may justifiably rely more on the Corps' expertise "in water management, wetlands protection, and other issues addressing both water quality and quantity").

86. Reeves, *White Paper*, *supra* note 2, at 113. See also Reeves, *Exotic Politics*, *supra* note 2, at 189-90.

87. Reeves, *White Paper*, *supra* note 2, at 109 (citing STEVEN E. RHOADES, *THE ECONOMISTS' VIEW OF THE WORLD: GOVERNMENT, MARKETS, AND PUBLIC POLICY* 40, *et seq.* (Cambridge Univ. Press) (1985)).

improved immensely in the past quarter-century. "Most authorities agree that the country has made significant progress in cleaning up pollution from 'point sources,' such as most industrial discharges and sewage treatment plants."⁸⁸ Sections 301 and 402 of the CWA "deserve[] a lion's share of the credit."⁸⁹

As mentioned above, section 301 prohibits discharges of pollutants unless a NPDES permit is obtained pursuant to section 402. NPDES permits must include technology-based effluent limitations,⁹⁰ water quality related effluent limitations, water quality standards, and ocean discharge criteria.⁹¹ Effluent limitations vary according to type of pollutant emitted and whether the discharger is a new or existing source.

A. *New vessels*

New sources are subject to the strictest standard of the CWA, the "best available demonstrated control technology" (BADT),⁹² regardless of the type of pollutants emitted. The term "source" sweeps relatively broadly to include any "building, structure, facility, or installation" which may discharge pollutants.⁹³ In contrast to the Clean Air Act's provision governing new sources,⁹⁴ section 306 is not explicitly limited to stationary sources, and could include mobile sources such as ships. Under the CWA, a source is considered "new" if construction began after proposed regulations are published, establishing performance standards for the relevant category of sources.⁹⁵

BADT performance standards require the greatest degree of effluent reduction achievable for an industrial class.⁹⁶ The BADT standard can force process changes, operating methods or other alternatives, "including, where practicable, a standard permitting no discharge of pollutants."⁹⁷ Because new sources have the

88. Debra L. Donahue, *The Untapped Power of Clean Water Act Section 401*, 23 *ECOLOGY L.Q.* 201, 202-03 (1996). See Brian Weeks, *Trends in Regulation of Stormwater and Nonpoint Source Pollution*, 25 *ELR* 10300, 10301 (June 1995) (noting that the CWA has "drastically reduced surface water pollution from point sources."); Houck, *supra* note 79, at 418, 463 (discussing drop in point source discharges due to the CWA).

89. William H. Rodgers, Jr., *The Seven Statutory Wonders of U.S. Environmental Law: Origins and Morphology*, 27 *LOY. L.A. L. REV.* 1009, 1011 (1994).

90. See 40 C.F.R. § 122.2 (defining effluent limitations as "any restriction imposed by the Director on quantities, discharge rates, and concentrations of 'pollutants' which are 'discharged' from 'point sources' into 'waters of the United States,' the waters of the 'contiguous zone,' or the ocean.").

91. See CWA § 402(a)-(c), 33 U.S.C. § 1342(a)-(c). The Administrator can also set "other requirements as he deems appropriate." CWA § 402(a)(2), 33 U.S.C. § 1342(a)(2).

92. CWA § 306(a)(1), 33 U.S.C. § 1316(a)(1).

93. CWA § 306(a)(3), 33 U.S.C. § 1316(a)(3). Facilities, in turn, are defined by regulation as "buildings, structures, process or production equipment or machinery which form a permanent part of the new source and which will be used in its operation. . . ." See 40 C.F.R. § 122.29(5). This term, like the term "building," seems to include only stationary sources. The terms "structure" and "installation," however, could be construed more broadly.

94. 42 U.S.C. § 7411(a)(2), (b)(1)(A).

95. CWA § 306(a)(2), 33 U.S.C. § 1316(a)(2).

96. See CWA § 306(a)(1), 33 U.S.C. § 1316(a)(1).

97. *Id.*

opportunity to install the best and most efficient production processes and treatment technologies, generally at lower cost than retrofitting existing facilities, BADT "should represent the most stringent numerical values attainable through the application of the best available control technology" for all types of pollutants.⁹⁸

Although stringent, BADT is unlikely to put most new facilities in economic jeopardy because they are only required to adopt technologies already demonstrated, and because Section 306 directs EPA to consider both the cost of achieving the effluent reduction and any non-water quality environmental impacts and energy requirements.⁹⁹ In addition, BADT provides protection for facilities that meet all applicable standards; they will not be subjected to any more stringent standards of performance during the ten-year period following completion of construction, or depreciation or amortization of the facility, whichever date is earlier.¹⁰⁰

Thus far, BADT has only been applied to a limited number of industrial categories, many of which are explicitly listed in Section 306.¹⁰¹ EPA is directed to revise the list of categories governed by BADT "from time to time."¹⁰² Once vessels are listed under Section 306, BADT would most certainly be more stringent than NISA's requirement for 30 ppt salinity, or roughly 85% ballast exchange, and would result in greater reductions in contaminated ballast discharges in vulnerable U.S. waters as new ships are built.

B. Existing vessels

Effluent limitations for existing facilities and vessels vary according to the type of pollutant discharged. Existing sources of toxic and nonconventional pollutants are required to meet effluent limitations based on the best available technology (BAT).¹⁰³ In comparison, existing sources of conventional pollutants, such as suspended solids and fecal coliform, must meet the best conventional

98. Final Rule for Pharmaceutical Manufacturing Category Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards, 63 Fed. Reg. 50388, 50390 (1998).

99. CWA § 306(b)(1)(B), 33 U.S.C. § 1316(b)(1)(B). See Sidney A. Shapiro & Thomas O. McGarity, *Not So Paradoxical: The Rationale for Technology-Based Regulation*, 1991 DUKE L.J. 729, 744 n.80 (1991) (reaching similar conclusion with respect to BAT standard).

100. CWA § 306(d), 33 U.S.C. § 1316(d).

101. See CWA § 306(b)(1)(A), 33 U.S.C. § 1316(b)(1)(A) (including pulp and paper mills, meat product and rendering processing, grain mills, and other types of industrial facilities).

102. *Id.*

103. See CWA § 301(b)(1), (g)(1), 33 U.S.C. § 1311(b)(1), (g)(1).

technology (BCT) for their industrial category.¹⁰⁴

Toxic pollutants include those listed pursuant to section 307.¹⁰⁵ Nonconventional pollutants fall into a "catch-all" category of pollutants – those that are not toxic or conventional.¹⁰⁶ Congress explicitly listed several nonconventional pollutants, such as chlorine, ammonia, color, as well as the thermal component of discharges¹⁰⁷ and gave EPA authority to list additional nonconventionals.¹⁰⁸

Although some components of ballast water discharges, such as suspended solids, would be considered conventional pollutants, biological materials like exotic species would likely fall under the catch-all category of nonconventional pollutants, and therefore subject to BAT. If EPA were to characterize exotics as nonconventionals, that determination would be reasonable and would be accorded great deference.¹⁰⁹

BAT generally requires that existing technology utilized by the "cleanest" firms in the industry be adopted.¹¹⁰ In setting BAT, EPA takes into account engineering technology and operational processes for categories and subcategories of industry.¹¹¹ Although BAT is established with reference to the "best" technology, it does not require the facility to adopt any one particular technology. Instead, individual dischargers may choose their own abatement technique as long as the effluent levels specified in their permits are met.¹¹²

In addition, EPA is to consider the costs of achieving the best technology available and any non-water quality impacts, as well as energy requirements, in setting BAT.¹¹³ The EPA retains considerable discretion in assigning the weight

104. See CWA § 304(a)(4), 33 U.S.C. § 1314(a)(4). Congress designated the following conventional pollutants in the CWA: biochemical oxygen demanding (BOD) pollutants, like nitrogen and phosphorous; total suspended solids (TSS); fecal coliform; pH; and any additional pollutants defined by the Administrator as conventional. CWA § 304(a)(4), 33 U.S.C. § 1314(a)(4). EPA subsequently designated oil and grease as an additional conventional pollutant on July 30, 1979 (44 Fed. Reg. 44501). Conventional pollutants are generally oxygen demanding and eutrophying, or contribute to turbidity. See EPA Policy for the Development of Water Quality-Based Permit Limitations for Toxic Pollutants, 49 Fed. Reg. 9016 (1984).

105. See CWA § 307, 33 U.S.C. § 1317.

106. See CWA § 301(b)(2)(F), (g)(1), (4), 33 U.S.C. § 1311(b)(2)(F), (g)(1), (4).

107. See CWA § 301(g)(1), (4), 33 U.S.C. § 1311(g)(1), (4).

108. See CWA § 301(b)(2)(F), 33 U.S.C. § 1311(b)(2)(F).

109. See *Rybachek v. EPA*, 904 F.2d 1276, 1292 (9th Cir. 1990) (finding that "EPA's decision to treat settleable solids as a nonconventional pollutant and thus subject to BAT standards was both reasonable and permissible") (citing *Chevron*, 467 U.S. at 837). See also *American Petroleum Inst. v. EPA*, 858 F.2d 262, 263 n.2 (5th Cir. 1988) (upholding EPA's designation of diesel oil as nonconventional "indicator" pollutant, resulting in imposition of more stringent BAT regulations over discharge of muds and cuttings contaminated with diesel oil for use in off-shore drilling operations), *clarified on other grounds*, 864 F.2d 1156 (5th Cir. 1989).

110. See *Houck*, *supra* note 79, at 451.

111. See CWA §§ 301(b)(2)(A), 304(b)(2)(B), 33 U.S.C. §§ 1311(b)(2)(A), 1314 (b)(2)(B); *Houck*, *supra* note 79, at 445 n.188.

112. See Dale B. Thompson, *Beyond Benefit-Cost Analysis: Institutional Transaction Costs and Regulation of Water Quality*, 39 NAT. RESOURCES J. 517, 522 (1999).

113. CWA § 304(b)(2)(B), 33 U.S.C. § 1314(b)(2)(B).

to be accorded these factors.¹¹⁴ Although costs play a role in setting BAT, unlike the BCT limitation for conventional pollutants,¹¹⁵ EPA need not perform a cost-benefit analysis or otherwise justify its choice of BAT on economic grounds, as long as it has determined that the costs can be borne by industry.¹¹⁶ That the technology is indeed available provides evidence costs that can be borne by the industry.

[O]stensibly cost-blind standards can help stimulate the development of improved pollution control technology. Thus, they can be rationalized as important elements of efforts to ascertain where technology-forcing can be pursued with greatest promise. Regulations that confront industry with the prospect of substantial compliance costs create greater incentives for the development of cheaper control technology. Time and time again, after regulations have gone into effect, regulatory targets have proven able to do what they previously claimed was impossible when they were seeking to forestall the regulations. A study of industrial responses to regulation found that the stringency of regulation was "the most important factor influencing technological innovation."¹¹⁷

Most facilities have been able to comply with BAT at a reasonable cost.¹¹⁸ BAT does not require a blind eye toward differences among facilities within industrial categories and among geographical areas. EPA has the authority to grant variances or modifications to account for operational differences and even economic hardship.¹¹⁹ Section 301(g) authorizes a waiver from BAT requirements for nonconventional pollutants if the applicant can demonstrate that its proposed modified effluent limitation is equal to or more stringent than the applicable water quality standards and the initial standard required under the CWA, *i.e.*, the "best practicable control technology currently available" (BPT).¹²⁰ The applicant must also show that the modification will not result in additional requirements for other sources, and demonstrate its discharges will not impair the integrity of the receiving water or pose unacceptable risks to the environment or

114. See *Chemical Mfrs. Ass'n v. EPA*, 879 F.2d 177 (5th Cir. 1989).

115. BCT is roughly equivalent to the "best of the average" performers in an industrial category. BCT limitations are established in light of a variety of factors, including a two part "cost-reasonableness" test. See CWA § 304(b)(4)(B), 33 U.S.C. § 1314(b)(4)(B); *American Paper Institute v. EPA*, 660 F.2d 954 (4th Cir. 1981). EPA's current methodology for the development of BCT limitations was issued in 1986. 51 Fed. Reg. 24974 (July 9, 1986).

116. See *Chemical Mfrs. Ass'n*, 879 F.2d at 250, citing *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 71 n. 10 (1980) (Section 304(b)(2)(B) "does not state that costs shall be considered in relation to effluent reduction").

117. Robert V. Percival, *Regulatory Evolution and the Future of Environmental Policy*, 1997 U. CHI. LEGAL F. 159 (1997), (citing KURT FISCHER & JOHAN SCHOT, ENVIRONMENTAL STRATEGIES FOR INDUSTRY 282 (Island 1993) (citing Nicholas A. Ashford, *Understanding Technological Responses of Industrial Firms to Environmental Problems: Implications for Government Policy*)).

118. See Shapiro & McGarity, *supra* note 99, at 744 n.80.

119. See, *e.g.*, CWA § 301(c),(g),(h), 33 U.S.C. § 1311(c),(g),(h).

120. CWA § 301(g), 33 U.S.C. § 1311(g).

human health due to bioaccumulation, persistency, acute or chronic toxicity, or synergistic propensities.¹²¹

In addition, section 301(c) gives the EPA authority to modify BAT requirements upon a showing that such modified requirements will: (1) represent the maximum use of technology within the economic capability of the owner or operator, and (2) result in reasonable further progress toward the elimination of the discharge of pollutants.¹²² Section 301(n) also allows variances if the facility demonstrates it is fundamentally different with respect to relevant factors.¹²³

The imposition of BAT would likely force older vessels to retrofit to achieve greater exchange rates or employ alternative treatment technologies to avoid introducing exotics through ballast discharges altogether.¹²⁴ There is reason to believe that existing vessels can do better than the current exchange rate, and this would be necessary if BAT applied.¹²⁵ In fact, the Coast Guard has indicated that 90% is an achievable rate of exchange for existing vessels.¹²⁶ Although there are few incentives under the current regime for ships to improve upon their exchange rate or employ the "best" available alternative strategies, several promising technologies are currently being explored: shoreside treatment; ultraviolet light; micro-filtration; ozonation; environmentally friendly biocides; and temperature (heat).¹²⁷ A Canadian vessel, the ALGONORTH, is implementing a demonstration project, utilizing a filter that can trap particles as small as twenty-five microns.¹²⁸ This would trap aquatic vertebrates, fish eggs and mussel veliger larvae, along with most invertebrate eggs, fungi and algae cysts.¹²⁹ With additional treatment, such as ultraviolet light or biocides, even smaller bacteria and viruses could be eradicated.¹³⁰

While BADT for new vessels could arguably establish standards reflecting the

121. *See id.*

122. *See* CWA § 301(c), 33 U.S.C. § 1311(c).

123. CWA § 301(n), 33 U.S.C. § 1311(n). The CWA also allowed dischargers of conventional pollutants to use "innovative technology" resulting in effluent reductions significantly greater than otherwise applicable standards, so long as the control method "moves toward the national goal of eliminating the discharge of all pollutants." CWA 301(k), 33 U.S.C. § 1311(k).

124. *See* Foster, *supra* note 45, at *WL 25 n.125 (discussing expert opinions regarding ship board versus on shore treatment).

125. *See* Reeves, *supra* note 8, at 66 (indicating that 98% exchange may be a "reasonably high standard"); 63 Fed. Reg. 17782, 17785-89 (1998) (proposed Coast Guard regulations would require 90%, a "reasonably complete exchange").

126. *See* 63 Fed. Reg. at 17785, 17789.

127. *See* Reeves, *White Paper*, *supra* note 2, at 47-50 (assessing relative merits and costs of improved ballast exchange, filtering, UV light, biocides, heat, and shoreside treatment); Foster, *supra* note 45, at *WL 25 n.125 (discussing application and success of various alternatives in experimental efforts).

128. *See* Lake Carrier's Association, *Managing Ballast Water to Stop the Introduction of Non-Indigenous Species* (visited Sept. 17, 1999) <<http://www.lcaships.com/hpbw.html>>.

129. *See* Reeves, *White Paper*, *supra* note 2, at 117.

130. *See id.* The ALGONORTH, however, filters only 1,500 gallons per minute; 1,000-foot United States lakers, carrying as much as 14 million gallons of ballast water when "light" on cargo, could require filtration up to 18,000 gallons per minute. *See* Lake Carrier's Association, *supra* note 128; Allegra Cangelosi, *The Algonorth Experiment*, SEAWAY REV. at 29-33 (Jan. - Mar., 1997).

ALGONORTH project, the BAT standard would not be set this high until the filtration system is better established and more widely available. However, if EPA were to simply set BAT at NISA levels, it could be challenged for failing to consider better control technologies. Although EPA need not be "fully cognizant of every innovation, wherever employed....," it is arbitrary and capricious to consider only those technologies that are widely available.¹³¹ For example, EPA has been required to consider zero discharges for the organic chemicals, plastics and synthetics fibers industries where thirty-six plants had already eliminated their discharges through recycling.¹³²

The CWA's effluent limitations would also apply to NOBOB's. The vessel itself is the regulated point source, regardless of the quantity of ballast water; therefore, BAT would be set for NOBOB's just as it would for other vessels. In other words, treatment or exchange would be required prior to discharge into U.S. waters, regardless of whether a vessel entered fully loaded or not. Possible options include requiring NOBOB vessels to lighten their load of cargo by an amount that would allow an influx of enough water to pump out the residues (an operation called "swish and spit").¹³³ Other suggested treatment methods for sediment and slop in a NOBOB tank include chemical biocides and heat.¹³⁴

C. Water Quality Standards

In addition to effluent limitations, permit requirements must be ratcheted up if necessary to meet water quality standards.¹³⁵ The States generally adopt water quality standards based on EPA guidelines and subject to EPA approval.¹³⁶ Section 303(c) requires that state water quality standards "protect the public health or welfare, enhance the quality of water and serve the purposes of this [Act] . . . taking into consideration their use and value for propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes."¹³⁷ The enhancement of water quality for the protection of the propagation of fish and other aquatic life is a key concern of section 303.¹³⁸

Under section 303(c), a water quality standard for a specific waterbody consists of two components: designated uses for which a waterbody is to be

131. *Chemical Mfrs. Ass'n*, 870 F.2d at 263.

132. *See id.* at 264. *See* Houck, *supra* note 79, at 452 (noting that EPA's final standard for organic chemicals and plastics could hardly be called the *best* available technology, where EPA failed to recognize that recycling technologies adopted by a number of plants had already achieved zero discharge).

133. Reeves, *supra* note 8, at 55 (noting that "swish and spit" would require approximately 1.5% reduction in cargo).

134. *See id.* at 55.

135. CWA § 303(b)(1)(C), 33 U.S.C. § 1313(b)(1)(C). "[T]here shall be achieved . . . any more stringent limitation, including those necessary to meet water quality standards . . . established pursuant to any State law or regulations." *Id.*

136. *See* CWA §§ 304(a), 303(c), 33 U.S.C. §§ 1314(a), 1313(c).

137. CWA § 303(c), 33 U.S.C. § 1313(c).

138. *See id.* The ultimate purpose of water quality standards, as with the other provisions of the CWA, is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." CWA § 101(a), 33 U.S.C. 1251(a).

protected (such as recreation in and on the water, protection and propagation of fish and wildlife, or agricultural uses) and the water quality criteria which support those designated uses.¹³⁹ Each state must identify those waters for which existing technology-based pollution controls are not stringent enough to attain or maintain state water quality standards. Section 303(d)(2) requires that states submit and EPA approve or disapprove lists of waters for which existing technology-based pollution controls are not stringent enough to attain or maintain state water quality standards.¹⁴⁰ For those waters identified, states are required to establish total maximum daily loads (TMDLs) for identified pollutants as necessary to implement applicable water quality standards with an adequate margin of safety.¹⁴¹

California, for example, has listed several water bodies as impaired due to the presence of exotic species.¹⁴² Theoretically, any permitted discharge into an impaired water would have to attain zero discharge of exotics to protect designated uses and avoid further degradation of those waters.¹⁴³ Disparate standards among the states could result in a patchwork-quilt of regulatory requirements, varying among jurisdictions. To ensure compliance, vessels could be required to meet the most stringent restrictions of all states they pass through. Ship owners and operators would resist individual state efforts as confusing and inefficient. Some uniformity may be necessary to address these concerns.¹⁴⁴

D. Public involvement and enforcement

The CWA permit program is all the more effective because it provides both opportunities for public involvement and straightforward enforcement provisions. Before a permit may issue, EPA must allow for public comment and determine that the discharge will comply with the applicable requirements of the CWA.¹⁴⁵ Input received during the public comment period is included as part of the administrative record.¹⁴⁶ At the close of the comment period, the Regional Administrator decides whether to issue or deny a permit application.¹⁴⁷ Any interested person may request a formal hearing within thirty days of the Administrator's determination.¹⁴⁸

Once a permit is in place, the CWA provides for enforcement through citizen suits as well as administrative, civil and criminal penalties. Thus, bringing ballast water discharges into the CWA program would result in almost immediate improvement: the CWA's significant civil and criminal penalties, along with

139. See 40 C.F.R. part 131.

140. See CWA § 303(d)(2), 33 U.S.C. § 1313(d)(2).

141. See CWA § 303(d)(1)(C), 33 U.S.C. § 1313(d)(1)(C).

142. See 63 Fed. Reg. 59556.

143. See Foster, *supra* note 45, at 23-24.

144. See Section IV.B *infra*.

145. See CWA § 402(a)(1), 33 U.S.C. § 1342(a)(1); 40 C.F.R. § 124.12(c).

146. See 40 C.F.R. §§ 124.10, 124.12(a)(4).

147. 40 C.F.R. § 124.15.

148. 40 C.F.R. § 124.74(a).

provisions for citizen suits with attorneys' fee awards, provide powerful incentives for dischargers to improve operations as quickly as possible.¹⁴⁹

This straightforward and effective enforcement scheme, in which the permit holder must report on and be held accountable for its compliance with its permit and which provides multiple opportunities for enforcement, including by citizens, did not come about by accident. Congress consciously mandated an aggressive, effective enforcement system when it drafted the Clean Water Act, providing, for example, for citizen suits. During Senate consideration of the conference report in 1972, Sen. Birch Bayh (D-Ind.) said: 'We have learned by disappointing experience, Mr. President, that without strict enforcement and meaningful deterrents, water pollution control laws will have no real effect. The bill before us provides the enforcement and deterrents we need.'¹⁵⁰

The opportunity for both industry and environmental interest groups to challenge EPA decisions in court provides a tremendous incentive for the agency to equitably and reasonably balance competing interests and embrace effective, yet practical, solutions. "Judicial review is one reason American environmental law works, and the quite similar laws of other countries do not."¹⁵¹

CWA section 505 authorizes any citizen to commence a civil action "against any person . . . who is alleged to be in violation of . . . an effluent standard or limitation under this chapter."¹⁵² In enacting CWA section 505, Congress recognized, at least implicitly, citizens would be especially effective advocates.¹⁵³ "One of the greatest elements of the U.S. system of environmental law, itself arguably the greatest in the world, is the citizen lawsuit."¹⁵⁴ The list of citizen suits which have impacted the way business is done in the United States is impressive, ranging from ConEdison's thwarted plan to build a huge hydroelectric facility on Storm King Mountain, to the Tennessee Valley Authority's confrontation with the snail darter, to Disney's attempts to build a ski

149. See Rodgers, *supra* note 89, at 1012 (noting that one of the reasons for the CWA's successes in reducing water pollution is its effective system of monitoring, underscored by a highly effective citizen-suit mechanism).

150. Drew Caputo, *A Job Half Finished: The Clean Water Act After 25 Years*, 27 ELR 10574, n.82 (1997) (citing U.S. Government Printing Office, 1 A Legislative History of the Water Pollution Control Act Amendments of 1972, 216 (1973)).

151. Houck, *supra* note 79, at 467.

152. CWA § 505(a)(1), 33 U.S.C. § 1365(a)(1). An "effluent standard or limitation" is defined as, among other things, an unlawful act under CWA § 301(a). *Id.* at § 1365(f).

153. See WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW 63 (1986) (noting that Congress, through various provisions of the CWA, encouraged "citizen initiatives to enforce the water pollution laws"). See also Jeffrey G. Miller, *Private Enforcement of Federal Pollution Control Laws Part I*, 13 ELR 10309 (1983) (detailing legislative history of citizens' suits provisions).

154. Claudia Polsky & Tom Turner, *Justice on the Rampage*, 21 AMICUS J. 34 (1999).

resort in an isolated valley of the Sequoia National Forest.¹⁵⁵ "In no other political and social movement has litigation played such an important and dominant role."¹⁵⁶

Citizen suits provide an opportunity to achieve enforcement where the EPA has been unwilling or unable to achieve it due to lack of resources or, sometimes, lack of political fortitude.¹⁵⁷ They are especially important to ensure the implementation and enforcement of politically charged programs like water quality standards and allocations for non-point sources, many of which would require changes in local land use planning. For example, the TMDL requirement for addressing water quality-impaired water-bodies was virtually ignored until a series of citizen suits forced compliance.¹⁵⁸

Without citizen enforcement, most environmental programs "would probably have continued to languish under the political constraints of the marketplace."¹⁵⁹ If not checked by aggressive enforcement, particularly by citizens, industry is likely to bow to the economic pressure to pollute: "noncompliance results in economic benefits (the free use of public waterways for waste disposal), while compliance exacts a financial cost (the construction and operation of expensive pollution removal facilities)."¹⁶⁰

In comparison, federal economic initiatives, whether in the form of subsidies or taxation, generally inhibit citizen involvement. Citizens, as taxpayers, often have difficulty establishing standing to challenge federal spending programs in court.¹⁶¹ In *Frothingham v. Mellon*, a taxpayer alleged that Congress, in enacting the Maternity Act of 1921, had deprived her of property without due process in violation of the Fifth Amendment and had invaded the legislative powers reserved to the States by the Tenth Amendment, thereby exceeding the spending

155. See *Tenn. Valley Auth. v. Hill*, 437 U.S. 153 (1978) (enjoining construction of dam); *Scenic Hudson Preservation Conference v. Fed. Power Comm'n*, 354 F.2d 608 (2d Cir. 1965) (remanding FPC license to construct pumped storage hydroelectric project), *cert. denied*, 384 U.S. 941 (1966). See also *Sierra Club v. Morton*, 405 U.S. 727 (1972) (holding that Sierra Club did not have standing because it failed to allege that corporation or its members would be affected by the proposed ski resort; however, the resort was never actually built). See Rodgers, *supra* note 89, at 209 n.12.

156. Polsky & Turner, *supra* note 154.

157. See Michael D. Axline & Patrick C. McGinley, *Universal Statutes and Planetary Programs: How EPA Has Diluted the Clean Water Act*, 8 J. ENVTL. L. & LITIG. 253, 287-88 (1993). See Michael R. Lozeau, *Tailoring Citizen Enforcement to an Expanding Clean Water Act: The San Francisco Baykeeper Model*, 28 GOLDEN GATE U. L. REV. 429, 440 (1998) (describing role of NRDC in CWA enforcement during diminished role of EPA during Reagan administration).

158. See Oliver A. Houck, *TMDLS, Are We There Yet?: The Long Road Toward Water Quality-Based Regulation Under the Clean Water Act*, 27 ELR 10391 (1997).

159. Zygmunt Plater, *Environmental Law and Three Economies: Navigating a Sprawling Field of Study, Practice and Societal Governance in Which Everything is Connected to Everything Else*, 23 HARV. ENVTL. L. REV. 359, 382-83 n.54 (1999). See JOHN CRONIN & ROBERT F. KENNEDY, JR., *THE RIVERKEEPERS* at 178-99 (1997) (discussing need for citizen enforcement in light of under-enforcement by federal and state environmental agencies due to "agency capture" by regulated industry, political pressure and budget shortfalls).

160. CRONIN & KENNEDY, *supra* note 159, at 178.

161. See U.S. Const. art. III (providing federal courts with jurisdiction to hear only concrete cases or controversies).

power of Article I, Section 8.¹⁶² The Supreme Court held that the taxpayer had no standing to bring these general grievances about the conduct of government or the balance of power in the federal system.¹⁶³ Thus, unless a taxpayer alleges a violation of a specific constitutional limitation on the spending power, such as the Establishment Clause of the First Amendment,¹⁶⁴ the suit will be dismissed. The most plausible challenge to economic programs applicable to ballast water discharges would be on the grounds of arbitrary and capricious action under the APA; as such, plaintiffs would likely lack standing.¹⁶⁵

E. The Efficacy of the CWA's Technology-Based Controls

1. The Virtues of Regulatory Programs over Economic Initiatives

Although there is still work to be done,¹⁶⁶ the first round of technology-based controls under the Federal Water Pollution Control Amendments of 1972 resulted in significant process changes. For the first time in years of federal involvement in water quality, pollution loadings dropped and measurable abatement occurred.¹⁶⁷ "Technology-based regulation is concededly imperfect . . . [b]ut this 'academic failure' has been an enormous success in the real world."¹⁶⁸

Professor Oliver Houck describes this phenomenon as the "convergent evolution" of successful environmental law: "Over time, the job will select the tool."¹⁶⁹ In the context of discharges into water, the successful tool has been the NPDES program. Technology-based standards, requiring the best available controls on the source of the pollutant, won "their primacy because other approaches simply couldn't hold their terrain."¹⁷⁰

162. *Frothingham v. Mellon*, 262 U.S. 447, 479 (1923).

163. *See id.*

164. *See Flast v. Cohen*, 392 U.S. 83, 103 (1968) (noting that "one of the specific evils feared by those who drafted the Establishment Clause . . . was that the taxing and spending power would be used to favor one religion over another or to support religion in general").

165. Challenges to economic incentive programs are almost routinely rejected for lack of standing. *See Simon v. Eastern Ky. Welfare Rights Org.*, 426 U.S. 26 (1976); *Allen v. Wright*, 468 U.S. 737 (1984).

166. *See ADLER, LANDMAN & CAMERON, THE CLEAN WATER ACT 20 YEARS LATER* 150-70 (1993). For example, the five-year review required by CWA, which views BAT development as a continuing, dynamic process, has bogged down under the weight of industry resistance and judicial challenges from both sides. *See Houck, supra* note 79, at 456, n.240-41.

167. *See Houck, supra* note 79, at 418, 463. *See also* Shapiro & McGarity, *supra* note 99, at 746 n.96 (reporting that the CWA's initial performance standards caused "some impressive reductions in conventional pollutant discharges," citing data on reductions from pulp and paper mills from 1973-1984, in Council on Environmental Quality, *Environmental Trends* 31 (1989)).

168. Shapiro & McGarity, *supra* note 99, at 743. As Professor Houck aptly notes, "The success of technology-based standards in abating toxic water pollution depends largely on one's predisposition to enjoy the donut or regret the hole." Houck, *supra* note 1, at 310.

169. Houck, *supra* note 79, at 407.

170. *Id.* at 427. *See Plater, supra* note 159, at 366, 374-78, 379-82 (generally discussing historic failure of market economics to address environmental problems).

The predominant technology-based force in the CWA, BAT, provides the necessary pressure of outside-in regulation. In spite of its limitations, BAT "has probably been the most effective pollution control program in the world in terms of producing identifiable abatement—short of outright bans—if only because alternative programs have proven equally burdensome and so much less effective. At the very least, the BAT process has proven, against vigorous opposition and the most dire predictions, that pollution could in fact be reduced without significant losses in employment, competitiveness, control, or industrial growth."¹⁷¹

Even the Coast Guard has recognized that performance standards will work better than NISA's salinity test. As noted above, the Coast Guard employs a 30 ppt salinity standard, which theoretically results in nominal exchange of 83-85%.¹⁷² Under new regulations proposed in 1998, a requirement for 90% exchange would have replaced the salinity test; salinity, among other things, would merely provide evidence exchange occurred.¹⁷³ However, these changes were not adopted when the interim rule issued in May 1999 "[b]ecause of strong opposition by the shipping industry."¹⁷⁴

Although regulatory approaches may not necessarily result in a perfect cost-benefit balance,¹⁷⁵ to the extent that excess costs occur under existing regulatory programs, they are justifiable for a variety of reasons. First and foremost, economic efficiency is not and should not be the only objective of environmental programs. Instead, the strongest arguments for regulation may well sound in democracy, sustainability, quality of life and environmental equity rather than economic efficiency.¹⁷⁶ Moreover, over time, history has proven regulation to be more effective in addressing and controlling pollution externalities than pure market-based mechanisms. When federal funding initiatives failed to address discharges from, e.g., sewage treatment plants, the CWA was amended to specifically require secondary treatment, as well as the regulation of combined

171. Oliver A. Houck, *The Regulation of Toxic Pollutants Under the Clean Water Act*, 21 ELR 10528, 10541-42 (Sept. 1991). See Houck, *supra* note 79, at 417-24 (describing gains made in cutting emissions into water and other media under "best available technology" approaches currently required by the CWA, CAA, and RCRA's hazardous waste pretreatment regulations).

172. See Section I *supra*, discussing effects and current control methods.

173. 63 Fed. Reg. 17782, 17785, 17789 (April 10, 1998) (stating that "90 percent is a reasonable standard to set, which is of minimal cost to the industry in that it does not require any changes to current ship designs, subject to the clearly stated exemption for vessels that cannot safely conduct an exchange").

174. Reeves, *White Paper*, *supra* note 2, at 67. See 64 Fed. Reg. 26672 (1999). Yet, the Coast Guard's stated goal remains "for owners and operators to exchange 100 percent of the original water in the ballast tank" if possible given "operating systems and physical limitations of the vessel." 64 Fed. Reg. at 26677.

175. See Reeves, *White Paper*, *supra* note 2, at 109-11.

176. See Shapiro & McGarity, *supra* note 99, at 743; M. SAGOFF, *THE ECONOMY OF THE EARTH* (1988); Breger, Stewart, Elliott & Hawkins, *Providing Economic Incentives in Environmental Regulation*, 8 YALE J. ON REG. 463, 481-82 (1991).

stormwater overflows. Finally, significant progress occurred.¹⁷⁷

Of course, programs based on either technology-based controls or economic incentives involve a substantial governmental role of some kind and result in economic impacts.¹⁷⁸ However, in comparison, economic initiatives generally suffer a variety of deficiencies, even though economic approaches like that suggested by the *White Paper*, in keeping with the recent hue and cry for regulatory reform,¹⁷⁹ have found favor in both academia¹⁸⁰ and federal executive and legislative initiatives.¹⁸¹

Proponents of economic approaches themselves understate the difficulties of estimating costs and benefits. In particular, the marketplace generally underestimates ecological benefits or values.¹⁸² In *Ohio v. Department of Interior*,¹⁸³ regulations for the assessment of natural resource damages were invalidated because the assessment methodology relied too heavily on market or "use" value of the lost or damaged resource. There, the D.C. Circuit noted that

177. See CWA §§ 304(b)(2), 402(p), 33 U.S.C. §§ 1314(b)(2), 1342(p). See generally Valentina O. Okaru, *Financing Publicly Owned Treatment Works and Instituting Enforcement Measures Against Non-Compliant Works Under The Clean Water Act*, 2 BUFF. ENVTL. L.J. 213 (1994). Federal funding is still a component of the publicly owned treatment works (POTW) program, but before obtaining funds, "the applicant for a federal construction grant must show that its project is the most economical means of meeting effluent and water quality goals in a specific geographic area." G. Nelson Smith, III, *Lawmaker as Lawbreaker: Enforcement Actions Against Municipalities for Failing to Comply With the Clean Water Act*, 41 CLEV. ST. L. REV. 685, 700-701 (1993) (citing 33 U.S.C. § 1311(i) (1988)).

178. David M. Dreisen, *Is Emissions Trading an Economic Incentive Program?*, 55 WASH. & LEE L. REV. 289, 293 (1998).

179. Regulatory reform has gained renewed interest and vigor since the 104th Congress took its seat in 1994, but it had its supporters in earlier years as well, in particular, the Reagan Administration. See Thomas O. McGarity, *Regulatory Analysis and Regulatory Reform*, 65 TEX. L.R. 1243 (1987). Similarly, although cost-benefit analysis has played a significant role in environmental regulations since the early 1980's, see *id.*, it has become "even more significant" based in part on the principles of the 104th Congress's "Contract with America." Thompson, *supra* note 112, at 517, citing proposed CWA Amendments of 1995, H.R. 961, 104th Cong. (1995); H.R. 9, 104th Cong. (1995). See Exec. Order 12,866, 3 C.F.R. 638, reprinted in 5 U.S.C. § 601 (1994).

180. See CASS R. SUNSTEIN, AFTER THE RIGHTS REVOLUTION: RECONCEIVING THE REGULATORY STATE 74-110 (1990); Symposium, *Free Market Environmentalism: The Role of the Market in Environmental Protection*, 15 HARV. J.L. & PUB. POL'Y 297 (1992).

181. See, e.g., EPA, Regulatory Reinvention (XL) Pilot Projects, 60 Fed. Reg. 27282 (May 23, 1995) (proposing "Project XL" to provide businesses greater flexibility in meeting environmental goals); 60 Fed. Reg. 27282 (May 23, 1995) (embracing "Common Sense Initiative" to allow six industries to develop "cleaner, cheaper, smarter" approaches to regulation). The Clinton Administration has "jumped on the reinvention band-wagon by announcing several initiatives to further this goal," including a proposal to extend compliance schedules for effluent standards for companies adopting innovative approaches for pollution prevention. Paula C. Murray, *Inching Toward Environmental Regulatory Reform—ISO 14000: Much Ado About Nothing or a Reinvention Tool?*, 37 AM. BUS. L.J. 35, 36 (1999) (citing BILL CLINTON & AL GORE, REINVENTING ENVIRONMENTAL REGULATION 43 (1995)). See also Daniel A. Farber, *Taking Slippage Seriously: Noncompliance and Creative Compliance In Environmental Law*, 23 HARV. ENVTL. L. REV. 297, 307 (1999) (noting that the "Clinton Administration has shown particular interest in renegotiating regulatory standards").

182. See Plater, *supra* note 159, at 374-77, 379.

183. *Ohio v. Dep't of Interior*, 880 F.2d 432 (D.C. Cir. 1989).

Interior had "made no claim" that "use value" would in fact pay for restoration, replacement or acquisition of equivalent resources, as required by the Comprehensive Environmental Response, Compensation and Recovery Act (CERCLA),¹⁸⁴ indeed, "Interior could not possibly maintain that recovering \$15 per pelt for the fur seals killed by a hazardous substance release would enable the purchase of an 'equivalent' number of fur seals."¹⁸⁵

As for implementation costs, economic incentive programs, be they tax-based or otherwise, could be equally, or even more, expensive than a technology-based regulatory program. Regulatory strategies are generally less expensive to monitor and enforce because inspectors need only determine whether the required technology has been installed and is being properly operated.¹⁸⁶ Conversely, economic approaches provide incentives to hide emissions or discharges to avoid the taxes or maximize subsidies.¹⁸⁷ Inspectors would be required to monitor the amount of pollution emitted from all possible discharge points on a continuous basis under a pollution tax or subsidy scheme, an expensive and labor-intensive endeavor.¹⁸⁸

Because there is virtually no way to calculate exactly how much abatement will result from any given pollution tax-rate at the front-end of the taxation program, the rate will have to be adjusted over time to meet abatement goals. Yet, legislatures are historically unwilling to revise tax rates after they are initially set.¹⁸⁹ During the time it takes for the system to reach "steady state," unless society is willing to tolerate high exposure levels, proceedings to set a tax rate will be highly contentious. Because industry tends to resist any change to status quo, especially if immediate outlays are required, implementation of an economic incentive program is likely to be slow.¹⁹⁰ Given the existing uncertainties about the presence, potential for entry and severity of effects of the next aquatic invader, the added uncertainty as to the appropriate level of taxes, along with the attendant delays of shifting to a new program, may well be intolerable.¹⁹¹

Critics of regulatory programs argue that industry can manipulate the rulemaking process, and the ultimate standards chosen, by withholding data on

184. 42 U.S.C. § 9607(f)(1).

185. *Dep't of Interior*, 880 F.2d at 445.

186. See Howard Latin, *Ideal Versus Real Regulatory Efficiency: Implementation of Uniform Standards and "Fine-Tuning" Regulatory Reforms*, 37 STAN. L. REV. 1267, 1270-71 (1985) (regulatory programs result in decreased costs for information collection and evaluation, and greater consistency and predictability of results).

187. See Shapiro & McGarity, *supra* note 99, at 749.

188. See *id.* See also Daniel H. Cole and Peter Z. Grossman, *When is Command-and-Control Efficient? Institutions, Technology, and the Comparative Efficiency of Alternative Regulatory Regimes for Environmental Protection*, 1999 WIS. L. REV. 887, 918-19 (1999) (monitoring and enforcement costs tend to be higher for market-based programs).

189. Shapiro & McGarity, *supra* note 99, at 748.

190. *Id.* at 745.

191. See Shapiro and McGarity, *supra* note 99, at 743. The *Exotics Policy White Paper* itself acknowledges that its conclusions raise "some highly complex questions about the synergistic interaction of taxes, subsidies, and regulatory costs in various competing segments of industry which are beyond the analysis I can present here." Reeves, *Exotic Politics*, *supra* note 2, at 202-05.

costly but effective abatement technologies.¹⁹² However, EPA's authority, under the CWA, to impose record-keeping, sampling and reporting requirements, and to inspect and gather data on the premises helps counteract this behavior.¹⁹³

Similarly, critics believe the establishment of emission levels based on current assessments of technology can minimize incentives for further innovation, as industry may be reluctant to invest in researching new control methods, knowing costs will increase as the BAT standard is ratcheted up.¹⁹⁴ However, economic initiatives, like subsidies and taxes, do not necessarily stimulate continuous environmental improvement and may even result in less technological innovation than comparable regulation.¹⁹⁵ Taxation, for example, could have the same "chilling" effect unless it is strictly monitored, adjusted and enforced: "The current income tax system, with its monument to the ingenuity of tax avoidance, does not inspire optimism on this point."¹⁹⁶

Along the same lines, regulatory programs are often accused of having the undesirable effect of rewarding older, dirtier plants through "grandfather" provisions, providing them with a perverse incentive to continue relatively cheap operations while placing new facilities at a disadvantage.¹⁹⁷ If necessary, however, CWA sections 301 and 402 do provide authority to force some of the oldest, dirtiest ships to retire if they cannot meet technology-based effluent limitations, which are to be made more stringent over time.¹⁹⁸

Moreover, it is possible to design a technology-based regulatory regime that does not reward old, dirty facilities or vessels. For example, the Oil Pollution

192. See Reeves, *White Paper*, *supra* note 2, at 114-17; ROBERT V. PERCIVAL, ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE & POLICY 165-67 (Brown, 2d ed. 1996) (citing ACKERMAN & STEWART, REFORMING ENVIRONMENTAL LAW: THE DEMOCRATIC CASE FOR MARKET INCENTIVES (1988)); Pedersen, *Turning the Tide on Water Quality*, 15 ECOLOGY L.Q. 69, 85 (1988); RICHARD POSNER, ECONOMIC ANALYSIS OF LAW 279 (2d ed. 1977).

193. CWA § 308(a), 33 U.S.C. § 1318(a). See Latin, *supra* note 186, at 1271.

194. See Dudek & Palmisano, *Emissions Trading: Why is this Thoroughbred Hobbled?*, 13 COLUM. J. ENVTL. L. 217, 234-36 (1988); POSNER, *supra* note 192, at 279. See also Reeves, *White Paper*, *supra* note 2, at 114 (quoting a vice president of Chrysler, discussing achievable technology for reducing emissions, "We're all worried that if we sound hopeful, what will the damned standards be tomorrow?").

195. See David M. Driesen, *Is Emissions Trading An Economic Incentive Program?: Replacing The Command and Control/Economic Incentive Dichotomy*, 55 WASH. & LEE L. REV. 289, 294 (1998); Cole & Grossman, *supra* note 188, at 892-94.

196. Shapiro & McGarity, *supra* note 99, at 749.

197. See Reeves, *White Paper*, *supra* note 2, at 116-17; Richard B. Stewart, *Controlling Environmental Risks Through Economic Incentives*, 13 COLUM. J. ENVTL. L. 153, 158 (1988) (arguing that the more stringent treatment of new sources "encourages existing sources to prolong their design lives and discourages new sources, with state-of-the-art water pollution technology, from entering the market"). Perhaps in recognition of the potential for stringent BADT standards to create incentives to keep older, dirtier facilities operating, EPA has, at least on occasion, attempted to set BADT for new sources no higher than BAT. See Houck, *supra* note 171, at WL*32 (discussing litigation and reversal of petrochemical industrial standards, in *Chem. Mfrs. Ass'n v. EPA*, 883 F.2d 253 (5th Cir. 1989)).

198. See *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64 (1980); 33 U.S.C. § 1311(d). See also notes 102-103 and 125-126, *supra*, and accompanying text (discussing BADT and BAT considerations).

Act (OPA) of 1990 phases in a double hull requirement for existing vessels over a period of twenty years, starting with the oldest, largest vessels, and requires double hulls for all new vessels built for oil transportation when they operate in U.S. waters or the U.S. exclusive economic zone.¹⁹⁹ The OPA has spurred active competition among naval architects to build a safer supertanker, and the world's first double hull supertanker was completed in Denmark in 1992.²⁰⁰ In addition, significant declines in oil spills, both in number of incidents and amounts spilled, have occurred.²⁰¹ Meanwhile, although freight rates increased by approximately 10%,²⁰² the flow of oil being shipped to the United States has continued with no interruptions.²⁰³ Attesting to OPA's efficacy, the International Maritime Organization (IMO) has followed suit by adopting regulations that will require double hulls or equivalent safety features for all new oil tankers.²⁰⁴

The final attack alleges that regulatory programs put "clean" facilities at a competitive disadvantage. But the best performers will not necessarily be disadvantaged under technology-based effluent limitations. Forcing the adoption of improved technology through regulation can result not only in emission reduction, but also, in some cases, greater efficiency and lower costs.²⁰⁵ Implementation of the Clean Air Act (CAA) has demonstrated industry routinely overestimates compliance costs but subsequently achieves legislative goals without losing their competitive edge. For example, the oil industry claimed

199. See 46 U.S.C. § 3703(a); 57 Fed. Reg. 36,222 (1992). For existing vessels, the double hull requirement is phased in over several years, depending upon the size and age of the vessel, beginning in 1995 and proceeding in stages until 2010, when all vessels over 5000 gross tons must be equipped with double hulls. See Jeffery D. Morgan, *The Oil Pollution Act of 1990: A Look at Its Impact on the Oil Industry*, 6 FORDHAM ENVTL. L.J. 1, 7 (1994).

200. PERCIVAL, ET AL., *supra* note 192, at 145 (citing Hudson, *Tanker Safety Plans are Muddled as Oil Spill Threatens Shetlands*, WALL ST. J., Jan. 8, 1993 at A7B).

201. The Coast Guard reported the following data for U.S. waters: 1991 – three spills totaling 55,000 gallons (the lowest level in 14 years); 1992 – 1 spill at 98,700 gallons; 1993 – 1 spill releasing 33,500 gallons; 1994 – 1 spill at 35,700 gallons. See PERCIVAL, ET AL., *supra* note 192, at 144.

202. See *id.* at 143.

203. See *id.* at 145 (citing Reuters, *Oil Supplies Unaffected by Tanker Rules*, N.Y. TIMES, Dec. 29, 1994 at D4). See 57 Fed. Reg. 1855 (1992). In fact, up until late 1999-early 2000, oil prices were the lowest seen in decades. See *Continuing Decline in Oil Prices Benefits Consumers and a Wide Range of Industries*, WALL ST. J., Dec. 2, 1998 at A2; Jeffrey Ball, *Gasoline Price Rise Worries Auto Makers*, WALL ST. J., Dec. 8, 1999 at A2 (reporting that, although oil prices rose somewhat during fall 1999, "[r]etail prices, adjusted for inflation, fell to their lowest level last year since pump prices began to be tracked in 1918, according to the American Petroleum Institute").

204. See PERCIVAL, ET AL., *supra* note 192, at 145.

205. See Houck, *supra* note 79, at 430 n.107 (requirements for alternative technology, including even outright bans of harmful substances, e.g., leaded gasoline and DDT, can force industry to find alternative means of production or alternative, less destructive, products and, in doing so, save money as well).

phasing out lead in gasoline would cost 95% more than it actually did.²⁰⁶ Pessimistic estimates of the costs of the 1990 CAA acid rain program were also overstated by almost 50%, as emissions trading, along with CAA Title IV restrictions, encouraged the use of low-sulfur western coal and scrubbers, and utilities responded favorably to rewards for conservation and renewable energy.²⁰⁷ Also as a result of the 1990 CAA amendments, ozone-depleting CFC's were phased-out, and ozone friendly substitutes became more widely available.²⁰⁸

The CWA's NPDES program can actually level the playing field for companies implementing technological controls because all facilities within an industrial class are required to meet a minimum threshold of "cleanliness."²⁰⁹ Facilities that improve their environmental image by affirmatively adopting innovations in technology could gain competitive advantage if their "green" reputation is touted through effective marketing campaigns and public relations efforts.²¹⁰ Meanwhile, uniform standards decrease the likelihood of social dislocation and "forum shopping" that can otherwise result from competitive disadvantages between geographical regions or between firms in regulated industries.²¹¹

2. Using Market-Based Tools to Supplement Regulatory Requirements

Once the regulatory stage is set, technological improvement could perhaps be encouraged through supplemental market-based incentives.²¹² For example, the 1990 CAA amendments' emissions trading program shows potential because it does not replace national air quality standards; rather, it simply provides flexibility in reaching the predetermined goals, *i.e.*, the permissible levels of exposure already set by the CAA.²¹³

206. See Alan S. Miller, *Environmental Regulation, Technological Innovation, and Technology-Forcing*, 10 NAT. RESOURCES & ENV'T 64, 66-67 (1995); PERCIVAL, ET AL., *supra* note 192, at 168-70. Ironically, although Nixon's proposal for a stiff tax on lead additives in 1971 to encourage their phase-out was given short-shrift by Congress at the time, the subsequent inclusion of mandatory lead phase-out in the CAA is now touted as "the singular success story in air pollution control." *Id.* at 168.

207. See *id.*

208. *Id.*

209. See Reeves, *White Paper*, *supra* note 2, at 111-12, and Reeves, *Exotic Politics*, *supra* note 2, at 192 (noting that the shipping industry asked the Vancouver Harbour Master to issue a standing order making a voluntary ballast exchange initiative into a mandatory program).

210. See Anastasios Xepapadeas & Aart de Zeeuw, *Environmental Policy and Competitiveness: The Porter Hypothesis and the Composition of Capital*, 37 J. ENVTL. ECON. & MGMT. 165-82 (1999).

211. See Latin, *supra* note 186, at 1270-71. See also Costle, 568 F.2d at 1369 (effluent limitations imposed by NPDES permits impose minimum, uniform floors below which neither individual nor jurisdictional efforts may sink, thereby avoiding the "race to the bottom" that would otherwise result among jurisdictions with different requirements).

212. See Houck, *supra* note 79, at 428, 454 n.226-28.

213. See 40 U.S.C. § 7651b; Shapiro & McGarity, *supra* note 99, at 747. See also Larry B. Parker, Robert D. Poling & John L. Moore, *Clean Air Act Allowance Trading*, 21 ENVTL. L. 2021 (1991) (noting that emissions trading initiatives have gained momentum with respect to addressing interstate air pollution).

Trading initiatives in general are cost effective only in situations where regulated facilities experience different marginal control costs, and reductions can be made more cheaply by some than by others.²¹⁴ Although these factors may be present among facilities and vessels subject to the CWA, it is not clear that a trading program could be used as a supplement to the NPDES program, or that it would make sense with respect to vessels engaged in commercial shipping.

Unlike the CAA, effluent trading programs are not explicitly authorized by the CWA.²¹⁵ EPA, however, construes the CWA to allow dischargers to trade wasteload allocations as a means to implement the TMDL program for meeting water quality standards.²¹⁶ The Clinton Administration's 1994 "Clean Water Initiative" indicates support for trading programs, and it recommends EPA study trading opportunities and publish additional guidance regarding possible pollutant trades.²¹⁷

While trading may be a viable option for meeting water quality objectives through TMDLs, it may not be so with respect to the NPDES program. Notably, the TMDL requirement provides a relatively close parallel to the CAA's approach; both focus on the achievement of ambient levels of "clean" water and air, respectively.²¹⁸ In contrast, point sources must meet technology-based

214. Alexandra Teitz, *Assessing Point Source Discharge Permit Trading: Case Study in Controlling Selenium Discharges to the San Francisco Bay Estuary*, 21 *ECOLOGY L.Q.* 79, 81-82 (1994) (noting that these factors allow a market to develop but that transaction costs can "impose trading barriers and reduce realizable cost savings").

215. See Elise M. Fulstone, *Effluent Trading: Legal Constraints on the Implementation of Market-Based Effluent Trading Programs Under the Clean Water Act*, 1 *ENVTL. LAW.* 459, 480-89 (1995) (concluding that CWA amendment might be necessary before such trading would be allowed, citing, e.g., the anti-backsliding provisions of 33 U.S.C. § 1342(o)). See also Teitz, *supra* note 215, at 108, 152 (concluding that CWA § 302(a)-(b), which require NPDES permits to specify effluent limitations unless elaborate modification procedures are met, "may significantly constrain the trading options currently available"). Fulstone recommends that Congress enact a variance from the CWA's technology-based requirements for "qualified" participants in "qualified" point source trading programs. Fulstone, *supra*, at 489.

216. See U.S. EPA, Assessment and Watershed Protection Division, Guidance for Water Quality Decisions: The TMDL Process 51 (EPA 44014-91-001 (Apr. 1991)). See also CWA § 303(d)(4)(A), 33 U.S.C. § 1313(d)(4)(A) (effluent limitations based on TMDL may be revised if the water quality standards will still be attained).

217. See President Clinton, *Clean Water Initiative: Restoring and Protecting America's Waters* (visited Jan. 25, 2000) <<http://www.epa.gov/owow/wtp1/cleanwater/progress/index.html>>. The Clean Water Initiative provides that EPA guidance: (1) "establish criteria to allow for prior approval of trades by" the permitting and administering authorities; (2) "specify that trades shall not violate water quality standards"; (3) "specify that where water quality standards are not met, trades based on TMDLs may still take place"; (4) identify settings, based on models, that may complement trading programs when on-site monitoring would be otherwise prohibitively expensive; (5) "clarify that the anti-backsliding provision of the (Clean Water Act) . . . does not prohibit trading"; and (6) authorize pretreatment trading programs. Fulstone, *supra* note 215, at 462 n.8. For a comparison of the costs of a German effluent trading system with the CWA's technology-based requirements, see Thompson, *supra* note 112, at 538-39 (concluding that, depending on certain variables, including how much industry spends to lobby Congress and the regulators, effluent trading may be more cost-effective).

218. See CWA § 303(d)(1)(C), 33 U.S.C. § 1313(d)(1)(C) (TMDLs shall be allocated to meet water quality standards) with 42 U.S.C. §§ 7409, 7502(c)(2) (state implementation plans must make "reasonable further progress" toward meeting National Ambient Air Quality Standards).

effluent limitations under the NPDES program regardless of the quality of the receiving water body.²¹⁹ Further, trading programs are not particularly useful when the goal is to achieve zero discharge, because there is nothing left to trade.

As a practical matter, a ballast water effluent trading program would be difficult to implement. While trading has worked relatively well for reducing air emissions from stationary sources like power plants, one wonders how such a program would apply in the context of mobile ships, flying the flags of various nations and utilizing multiple trade routes in and through the Great Lakes. For instance, how could a trading program be designed to assure that exotic species "hot spots" are avoided?²²⁰

This is not to say that alternative economic tools, such as providing rebates for clean ballast or taxing dirty ballast, must be universally rejected. The use of these and other types of economic initiatives should be explored to determine their potential for enhancing the regulatory program.²²¹

IV. THE PRACTICAL IMPLICATIONS OF NPDES PERMITTING FOR VESSELS

The regulation of ballast water discharges through NPDES permits will, no doubt, present a challenge to EPA, in part because EPA does not have the expertise regulating ships that it does regulating industrial dischargers. As a result, shipping companies and trade groups, accustomed to dealing with national coast guards and port authorities, will be resistant when EPA jumps into the existing regulatory fray.

More significantly, the challenge to ballast water regulation stems from the fact that commercial ships transporting cargo are, by their very nature, mobile, and not only originate from various nations but also frequently cross jurisdictional lines.²²² EPA typically delegates the permitting responsibilities of

219. See CWA §§ 301(b), 304(b), 402(a)(1), 33 U.S.C. §§ 1311(b), 1314(b), 1342(a)(1).

220. See Fulstone, *supra* note 215, at 462 n.109.

221. See Reeves, *Exotic Politics*, *supra* note 2, at 204-06. The potential implications of any form of subsidy for "clean" ballast would require detailed economic consideration, given that the construction and maintenance of the St. Lawrence Seaway is already subsidized. See *id.* at 205. Moreover, in general, federal expenditures aimed at supporting the position of particular industries should be used sparingly, only in those instances where private markets have failed, as in mass transit, or where public needs would otherwise go unmet, as in parks and the arts, and "should be constantly reevaluated in light of changing circumstances." CHARLES F. WILKINSON, *CROSSING THE NEXT MERIDIAN: LAND, WATER, AND THE FUTURE OF THE WEST* 19 (1992), citing U.S. Congress, Joint Economic Committee, *Subsidy and Subsidy-Effect Programs of the U.S. Government*, 89th Congress, 1st Sess., 1 (U.S. Gov't Printing Office 1965).

222. Of course, mobility in and of itself does not prevent a discharger from being classified as a point source. Courts have consistently held that dump trucks and bulldozers, such as those used for depositing and spreading fill, qualify as "point sources." See *United States v. Pozsgai*, 999 F.2d 719 (3d Cir. 1993); *Avoyelles Sportsmen's League, Inc. v. Marsh*, 715 F.2d 897, 922 (5th Cir.1983); *Matter of Alameda County Assessor's Parcel*, 672 F. Supp. 1278, 1284-85 (N.D.Cal.1987); *United States v. Tull*, 615 F. Supp. 610, 622 (E.D.Va.1983), *aff'd*, 769 F.2d 182 (4th Cir.1985), *rev'd on other grounds*, 481 U.S. 412 (1987). See also *Concerned Area Residents for Env't v. Southview Farm*, 34 F.3d 114, 119 (2d Cir. 1994) (finding that vehicles used to spread manure are point sources), *cert. denied*, 514 U.S. 1082 (1995).

the NPDES program to the states, each of which may exercise its authority over a vessel "point source" crossing through its waters. Although states cannot dip below the federal thresholds, each individual state can impose more stringent controls than the effluent limitations established by EPA, so disparities in standards are quite possible.²²³ Effective implementation of the NPDES program for ballast water discharges will depend on cooperative efforts between Great Lakes states, between EPA and the states, and between EPA and the Coast Guard.

A. *Administrative difficulties*

The logistical difficulties inherent in regulating vessels and their ballast water discharges do not provide EPA with an excuse to avoid regulating altogether. Courts have flatly rejected the notion that "administrative impossibility" justifies a refusal to require or issue NPDES permits for categories of point source dischargers.²²⁴ Instead, the CWA "gives EPA considerable flexibility in framing the permit to achieve a desired reduction in pollutant discharges. The permit may proscribe industry practices that aggravate the problem of point source pollution."²²⁵ Accordingly, if necessary, EPA might opt for gross reductions in pollutant discharges from a category of facilities or vessels, rather than engage in the fine-tuning necessitated by individualized effluent limitations. "But this ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all."²²⁶

Even if EPA initially addressed the problem of ballast water discharges by using a general or area-wide permit approach,²²⁷ performance would improve. General permits, addressed to a class of point source discharges, at least allow for public participation, and require EPA to focus on the problem of a region or class of activities and to revisit the issue every five years or less.²²⁸ In comparison, an exemption like section 122.3 "tends to become indefinite: the problem drops out of sight, into a pool of inertia, unlikely to be recalled in the absence of crisis or a strong political protagonist."²²⁹

223. CWA § 510, 33 U.S.C. § 1370; 40 C.F.R. § 122.1(f). See O'Toole, *supra* note 55, at 45 (discussing the Navy's difficulties in complying with disparate state standards, and noting that "no state has yet required the permitting of a U.S. Navy ship, though individual discharges are being increasingly challenged").

224. See *Costle*, 568 F.2d at 1369.

225. *Id.* at 1380.

226. *Id.* at 1380.

227. See 40 C.F.R. § 122.28 (1993).

228. *Costle*, 568 F.2d at 1382. See, e.g., 57 Fed. Reg. 41236 (1992) (providing for general permits for storm water discharges, requiring facilities to "implement a site-specific storm water pollution prevention plan"; however, if storm water discharges in a particular watershed or from particular facilities or industries are found to cause water quality problems, watershed-specific or other individualized permits may be required).

229. *Id.*

B. Inter-Agency and Inter-Governmental Cooperation

The CWA encourages and even requires coordination between the EPA and other federal entities, including the military and the Coast Guard, with respect to the regulation of vessels. For example, EPA must include a condition within permits issued to facilities that occasionally operate as transportation vessels, requiring that their discharges comply with any applicable Coast Guard regulations "that establish specifications for safe transportation, handling, carriage, and storage of pollutants."²³⁰

More specifically, the approach in CWA section 312 for discharges of sewage from vessels through marine sanitation devices (MSDs) and incidental discharges from vessels of the armed forces through marine pollution control devices (MPCDs) provides a cooperative model for EPA and the Coast Guard. Under section 312, EPA establishes general prohibitions and performance standards, while the Coast Guard has enforcement authority, allowing it to board and inspect vessels on navigable waters of the United States and execute warrants issued by officers or courts of competent jurisdiction.²³¹ However, because section 312 is not implemented through the NPDES permit program, it is not a complete analogy for EPA in regulating ballast water discharges from commercial vessels, but should be looked to merely for guidance.

With respect to MSDs, EPA, in consultation with the Coast Guard, must establish standards of performance to prevent the discharge of inadequately treated sewage from vessels²³² and a testing and certification regime to regulate the sale of MSDs.²³³ The standards, which are phased in over time for existing vessels,²³⁴ must be consistent with maritime safety and other marine and navigation laws and coordinated with Coast Guard standards.²³⁵ Commercial vessels operating in the Great Lakes must install MSDs that at least meet secondary treatment quality.²³⁶

MPCD performance standards are to be issued by EPA and the Department of Defense (DOD), in consultation with the Coast Guard and the Secretaries of State and Commerce.²³⁷ The standards should mitigate adverse impacts on the marine environment, considering the nature and environmental effects of the discharge, the practicability and costs of the installation and use of the MPCDs, effects on the vessel's operational capability, and applicable United States and international

230. 40 C.F.R. § 122.44(p).

231. See CWA § 312(k)-(l), 33 U.S.C. § 1322(k)-(l). Section 312 may also be enforced by a State. *Id.* at (k).

232. See CWA § 312(b), 33 U.S.C. § 1322(b). EPA had previously been reluctant to regulate sewage discharges from vessels due to the lack of availability of pump-out facilities. See S. REP. 95-370, 1977 U.S.C.C.A.N. 4326, at *59 (July 28, 1977).

233. See CWA § 312(g)-(h), 33 U.S.C. § 1322(g)-(h).

234. See CWA § 312(c)(1)(A), 33 U.S.C. § 1322(c)(1)(A).

235. See CWA § 312(b)(1), 33 U.S.C. § 1322(b)(1).

236. See CWA § 312(c)(1)(B), 33 U.S.C. § 1322(c)(1)(B).

237. See CWA § 312(n)(3)(A), 33 U.S.C. § 1322(n)(3)(A).

law.²³⁸ Standards may reflect distinctions between classes, types and sizes of vessels and may even be waived "as necessary or appropriate" for classes, types or sizes of vessels, as well as for individual vessels.²³⁹

Performance standards for vessels have been issued pursuant to a joint effort by EPA, the Coast Guard, and the Departments of Defense, State, and Commerce.²⁴⁰ EPA and DOD determined that it is reasonable and practicable to regulate discharges of ballast water through MPCDs,²⁴¹ and current management practices for open-ocean exchange, based on the IMO's guidelines, "demonstrate the availability of controls to mitigate the potential adverse environmental impacts from this discharge."²⁴²

Congress expressly preempted most state laws and regulations regarding the design, manufacture, installation or use of MSDs or MPCDs.²⁴³ Upon petition to EPA, however, states may prohibit discharges in some or all of the waters within the state as required for the protection and enhancement of water quality, if EPA determines, *inter alia*, that adequate facilities for the safe and sanitary removal and treatment of sewage or ballast water from vessels are reasonably available.²⁴⁴

Looking to section 312, EPA, with Coast Guard cooperation and input, could issue national effluent limitations for ballast water discharges from commercial vessels, reflecting BAT through MPCDs or alternative treatment methods. EPA, again with the Coast Guard as a consulting partner, could then issue general or

238. See CWA § 312(n)(2)-(3), 33 U.S.C. § 1322(n)(2)-(3). Section 312(n) applies unless the Secretary of Defense finds that compliance "would not be in the national security interests of the United States." *Id.* at (n)(1).

239. CWA § 312(c)(2), 33 U.S.C. § 1322(c)(2).

240. See 64 Fed. Reg. 25126, 25130 (1999) (final rule); 63 Fed. Reg. 45298, 45306 (1999) (proposed rule).

241. See *id.* at 45308 (defining MPCD, as used in the proposed rule, as "a control technology or a management practice that can reasonably and practicably be installed or otherwise used on a vessel of the Armed Forces to receive, retain, treat, control or discharge a discharge incidental to the normal operation of the vessel.").

242. *Id.* at 45310-11. The Navy and Coast Guard either currently implement or are in the process of approving a ballast water management policy requiring open-ocean ballast water exchange, based on IMO Guidelines for Preventing the Introduction of Unwanted Aquatic Organisms and Pathogens from Ships' Ballast Water and Sediment Discharge (May 10, 1995). See 63 Fed. Reg. at 45306. In the final rule, the agencies noted that a more detailed assessment of the MPCD control options and performance standards for each class of vessels would be performed in a subsequent phase of rulemaking. See 64 Fed. Reg. at 25130.

243. See CWA § 312(f)(1), 33 U.S.C. § 1322(f)(1). States are allowed to impose more stringent requirements for MSDs on houseboats. *Id.*

244. CWA § 312(f)(3)-(4), (n)(7)(B), 33 U.S.C. § 1322(f)(3)-(4), (n)(7)(B).

regional permits incorporating the effluent limitations.²⁴⁵ With a unified body of standards in place, vessel owners and operators get the benefits of certainty, and ships could be modified or designed to meet the standards, phased in to require state-of-the-art technologies within a reasonable period of time.²⁴⁶

Meanwhile, states would retain a role in enforcing the limitations contained within the permits.²⁴⁷ However, to avoid inconsistencies from port to port, the MSD and MPCA approach should be followed such that states could not impose more stringent requirements or establish "no discharge" zones absent appropriate determinations by EPA. Although states with delegated CWA enforcement authority may be reluctant to relinquish some of that authority back to the federal agencies, in the context of ballast water discharges, it would seem that states have more to gain than to lose under a program of uniform national effluent limitations.²⁴⁸

Existing statutory provisions may limit EPA's ability to approve or withdraw only that part of a state NPDES program dealing with vessels. The gist of section 402 is that states with "adequate authority" to carry out the permit program take over the entire program.²⁴⁹ To that end, state permit programs generally must be approved or disapproved in their entirety.²⁵⁰ The CWA does, however, explicitly

245. See, e.g., Seafood General Permit, 60 Fed. Reg. 34991 (1995) (authorizing discharges from offshore, nearshore and shore-based vessels and onshore facilities engaged in the processing of fresh, frozen, canned, smoked, salted, and pickled seafoods; permitted discharges include processing wastes, process disinfectants, sanitary wastewater, and other wastewaters, cooling water, boiler water, gray water, freshwater pressure relief water, refrigeration condense, water used to transfer seafood to a facility, and live tank water "to waters of the United States in and contiguous to the State of Alaska, except for receiving waters excluded from coverage as protected, special, at-risk, degraded or adjacent to a designated 'seafood processing center'"; discharges of petroleum hydrocarbons, toxic pollutants, or other pollutants not specified in the permit are not authorized).

246. See O'Toole, *supra* note 55, at 48. O'Toole concludes that "[t]he best way to ensure Navy ship compliance is to develop a coherent body of effluent standards for application to all Navy ships in all waters of the U.S. and on the high seas." *Id.* at 46. Instead of EPA enforcement, however, he recommends that the standards be implemented through the existing command and control structure of the Navy. *Id.*

247. See CWA § 402(b), 33 U.S.C. § 1342(b).

248. See O'Toole, *supra* note 55, at 48-49.

249. See CWA § 402(b), (c), 33 U.S.C. § 1342(b), (c). To establish "adequate" permit authority, states must insure, among other things, that their permits will (1) comply with CWA provisions governing effluent limitations, new sources, toxic pollutants, MSDs, and ocean discharge criteria; (2) be limited to fixed terms not exceeding five years; (3) be terminated or modified for cause; (4) require reporting and inspection; and (5) be enforceable through civil and criminal penalties. See *id.* at (b)(1)-(9). States must also insure that EPA will receive notice of permit applications, *Id.* (b)(4), and that no permit will issue if the Army Corps of Engineers, after consulting with the Coast Guard, determines that "anchorage and navigation" of navigable waters would be "substantially impaired." *Id.* at (b)(6).

250. See CWA § 402(c), (n), 33 U.S.C. § 1342(c), (n); See S. REP. No. 92-414, 71 (1971), U.S. CODE CONG. & ADMIN. NEWS 1972, 3737, 2 Legislative History of the Water Pollution Control Act Amendments of 1972 (Committee Print compiled for the Senate Committee on Public Works by the Library of Congress), Ser. No. 93-1, 1489 (1973). Even in delegated states, however, EPA retains substantial review authority. *Id.* See *EPA v. Cal. Water Resources Control Bd.*, 426 U.S. 200, 226 (1976) (citing legislative history).

allow for partial delegation, so long as the state's partial permit program covers major categories of point sources and is, in and of itself, a complete permit program covering a "significant and identifiable part of the State program."²⁵¹

Once a state program is approved, EPA can withdraw its approval if the state fails to administer it in accordance with federal requirements.²⁵² Again, Congress intended that state programs not be piecemealed.²⁵³ In fact, Congress rejected an EPA proposal that section 402 be revised to permit withdrawal for categories or classes of sources, reflecting its concern states be given maximum responsibility for the NPDES program and EPA's review authority be restricted as much as was consistent with its overall responsibility for assuring the CWA's national goals are met in a timely fashion.²⁵⁴ In any event, EPA withdrawal is a drastic measure, and there are significant obstacles to taking back authority: "The procedures for withdrawal of state programs would be suitable for the Nuremberg trials, and will be invoked only upon epochal occasions."²⁵⁵ Because of its disruptive nature and the resulting ill-will, EPA and state governments generally strive to avoid withdrawal.²⁵⁶

Instead of withdrawing state NPDES programs that attempt to impose more stringent or contradictory requirements on ballast water discharges, EPA could take either of two less drastic steps. Assuming EPA rescinds its regulation excluding ballast water discharges, states would have to submit to EPA for approval of new or additional components of their programs. EPA could then simply refuse to approve the portion of a state program dealing with vessels as a category of discharger.²⁵⁷

Alternatively, if a state had an approved program, EPA could veto individual ballast water discharge permits issued by the state on the grounds that any non-uniform requirements are "outside the guidelines and requirements" of the CWA.²⁵⁸ In practice, EPA's veto power is wielded with a light touch: "oversight is an essentially state-friendly process involving a great deal more jawboning and negotiation than adamant intrusion."²⁵⁹ However, individual permit supervision is less offensive to state sovereignty than withdrawal, and EPA should not be

251. See CWA § 402(n)(3)-(4), 33 U.S.C. § 1342(n)(3)-(4).

252. See CWA § 402(c)(3)-(4), (n), 33 U.S.C. § 1342(c)(3)-(4), (n).

253. See CWA § 402(c)(3), (d), 33 U.S.C. § 1342(c)(3), (d). These provisions have been described as giving "all-or-nothing authority to withdraw approval of a state NPDES program." *Cal. Water Resources Bd.*, 426 U.S. at 226 n.39.

254. See 1 Leg. Hist. 814, 854-855, H.R. REP. NO. 92-911, at 127.

255. RODGERS, *supra* note 153, at 367-68 (footnote omitted).

256. See D. Brennen Keene, *The Inconsistency of Virginia's Execution of the NPDES Permit Program: The Foreclosure of Citizen Attorneys General from State and Federal Courts*, 29 U. RICH. L. REV. 715, 748-49 (1995).

257. Disapproval would likely be on the grounds that inconsistent state programs fail to comply with CWA provisions governing effluent limitations. See CWA § 402(b)(1), 33 U.S.C. § 1342(b)(1).

258. See CWA § 402(d)(2), 33 U.S.C. § 1342(d)(2); 40 C.F.R. § 123.44(c).

259. Oliver Houck & Michael Rolland, *Federalism in Wetlands Regulation: A Consideration of Delegation of CWA § 404 and Related Programs to the States*, 54 MD. L. REV. 1242, 1293.

afraid to invoke its veto power in appropriate circumstances.²⁶⁰ Although Congress intended states to play a significant role in the NPDES program, it also wanted EPA to assure uniformity and consistency by engaging in a vigorous overview of state programs.²⁶¹

C. Coordination Between United States and Canada

Cooperation between U.S. and Canadian authorities is at least as important as it is among U.S. federal and state agencies. EPA's regulation of exotic species discharged in ballast water would advance the goals and policies of the U.S.-Canadian Great Lakes Water Quality Agreement of 1978, as amended in 1987 (GLWQA). Like the CWA, the GLWQA is intended "to restore and maintain the chemical, physical, and *biological* integrity of waters of the Great Lakes Basin Ecosystem."²⁶² The focus of the GLWQA has been, however, the control of chemical contaminants, particularly toxic pollutants.²⁶³ Although the GLWQA imposes no specific requirements with respect to exotics, Annex 6 of the Agreement, dealing with pollution from shipping sources, calls for studies to determine if exotics in ballast water discharges constitute a threat to the Great Lakes ecosystem.²⁶⁴

Under the GLWQA, the IJC is to monitor water quality and Great Lakes ecosystems as a whole, and provide recommendations to the governments of the United States and Canada.²⁶⁵ In this capacity, the IJC could provide a key coordinating role in synthesizing the efforts of the EPA and the Coast Guard under the CWA and NISA and Canadian programs under the Canadian Shipping Act and other relevant acts.

CONCLUSION

The CWA's NPDES program is clearly applicable to ballast water discharges from vessels. This regulatory approach advances all the advantages of a economic incentive program listed in the *White Paper*.²⁶⁶ The NPDES program could be implemented quickly and would result in emission reduction, and perhaps even elimination, of contaminated ballast water discharges through

260. See RODGERS, *supra* note 153, § 4.26, at 385 ("Individual permit supervision is a form of counsel quieter than a strident takeback of approved state authority . . . and should be invoked more often.").

261. S. REP. NO. 370, 95th Cong., 1st Sess. 73 (1977), reprinted in 1977 U.S.C.C.A.N. 4326. See Houck & Rolland, *supra* note 259, at 1293, 1312.

262. Great Lakes Water Quality Agreement of 1978 (GLWQA), as amended by the Protocol of 1987, Canada and U.S., 30 U.S.T. 1383, art. II (Nov. 22, 1978).

263. Representatives of some environmental groups expressed concern that using the GLWQA to envelop exotic species would diminish the effectiveness of the toxics program. See Reeves, *Exotic Politics*, *supra* note 2, at 134, 194-97.

264. GLWQA, *supra* note 262, at Annex 6. See also, GLWQA, *supra* note 262, at art. IV.

265. See *id.* art. III, § 1(c).

266. See Reeves, *White Paper*, *supra* note 2, at 122. See also Reeves, *Exotic Politics*, *supra* note 2, at 202-06.

improved technology. Moreover, BAT could serve to motivate vessel owners and operators to achieve a higher level of effectiveness by eliminating uncertainties and preventing jurisdictional disparities.

In comparison, economic approaches, whether in the form of taxes, subsidies or effluent trading programs, are not explicitly authorized by the CWA. Even if implicitly allowed by law, none of these tools provides an adequate replacement for the uniform limitations, public involvement and rigorous enforcement of the CWA's provisions on point source discharges.