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Oil Pollution Liability and Control Under International Maritime Law

Michael A. de Gennaro

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NOTES

Oil Pollution Liability and Control Under International Maritime Law: Market Incentives as an Alternative to Government Regulation

ABSTRACT

Oil spills on the world's oceans and waterways are a significant environmental threat. This Note explores some of the myriad reasons why the law—in both the United States and the international community—has failed adequately to address many of the reasons spills occur in the first instance.

*Beginning with a brief history of various pollution control schemes enacted over the past few years, this Note focuses on why the current international legal regimes remain ineffective in combating oil pollution. In essence, this Note argues that the current laws fail because of textual deficiencies, a failure to address the external economic realities of the shipping industry, and a basic misconception that *ex ante* punishment of multi-billion-dollar corporate polluters is more effective than *ex post* pollution control via market-based control mechanisms.*

This Note argues that the solution to oil pollution control rests in enacting market-based laws that allow for the free trading of pollution trading permits, such as those used with some success in the U.S. Clean Air Act amendments. Building on the writings of Ronald Coase, Lisa Heinzerling, and others, this Note argues that the application of law and economics methodology to oil pollution liability and control will yield more favorable results than the existing command-and-control structural paradigm.

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And learn O voyager to walk
The roll of earth, the pitch and fall
That swings across these trees those stars:
That swings the sunlight up the wall.
And learn upon these narrow beds
To sleep in spite of sea, in spite
Of sound the rushing planet makes:
And learn to sleep against this ground.¹

I. INTRODUCTION

Oil pollution from spillage and other accidents aboard transporting ships remain a significant threats to world oceans and

1. ARCHIBALD MACLEISH, *Seafarer*, in THE NORTON ANTHOLOGY OF POETRY 1064 (Alexander W. Allison et al. eds., 1975).

waterways. Since the vast majority of oil transported on the world's oceans is shipped via tanker, transporting vessels are a major target of pollution-preventing legislation. At the end of the 20th century, the world's tanker fleet consisted of 6,739 vessels, most of which boasted cargo capacities between 76,000 and 175,000 tons.² The international community has responded to the threat of oil spills posed by these huge vessels by passing several "super statutes," namely the Civil Liability Convention of 1969, coupled with the complementary 1992 international protocols,³ (collectively, CLCs), applicable to over 90 international states,⁴ and the Oil Pollution Act of 1990⁵ (OPA) in the United States.

Unfortunately, the existing statutory regimes have only served to create vast government bureaucracies, whose only true function is punishing polluters after spills have occurred.⁶ Administration of the CLCs and OPA "wastes tens of billions of dollars every year, misdirects resources, stifles innovation, and spawns massive and often counterproductive litigation."⁷ The after-the-fact system of fines and punitive measures created by the CLCs and OPA has not prevented the amount of oil spilled in the world's oceans during the last twenty-five years because it fails to address the market-based reality of the oil transport industry. Oil transporters will continue to pollute as long as they can afford the after-the-fact fines imposed by governments, provided the market does not exact a financial toll vis-à-vis factors such as decreased market capitalization and shareholder dissatisfaction.⁸ Although fines serve as a marginal deterrent, they do nothing to remedy the serious environmental damage caused by large oil spills.⁹ A system focusing on pre-pollution prevention, with the market—rather than government—as the chief regulatory force,

2. See *United States v. Locke*, 529 U.S. 89, 96 (2000).

3. International Convention on Civil Liability for Oil Pollution Damage, Nov. 29, 1969, 973 U.N.T.S. 3; Protocol to Amend the International Convention on Civil Liability for Oil Pollution Damage, Nov. 27, 1992, reprinted in 6A BENEDICT ON ADMIRALTY, Doc. 6-4B.

4. The international oil pollution liability regime consists in the aggregate of five separate parts: the International Convention on Civil Liability for Oil Pollution Damage of 1969, the Protocol to Amend the International Convention on Liability for Oil Pollution Damage of 1992, the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage of 1992, the International Convention on Liability and Compensation for Damage in connection with the Carriage of Hazardous and Noxious Substances by Sea of 1996, and the International Convention on Liability for Bunker Oil Pollution Damage of 2001.

5. 33 U.S.C. § 2701 (1994).

6. See *id.* (creating vast statutory framework, punishing polluters *ex post* the polluting events, rather than punishing *ex ante* pollution).

7. See Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1333 (1985).

8. See *infra* Part III and accompanying notes.

9. See *id.*

would create a more effective and efficient liability scheme for oil pollution prevention and control.

Although both the CLCs and the OPA have their merits, neither contains liability provisions that have been consistently effective in preventing oil pollution or holding polluters accountable for damage to the environment. This Note will explore some of the reasons for this failure, while proposing an alternative regime for combating the oil pollution problem.¹⁰

Part II addresses the history of oil pollution control and liability under international law, going back to the beginning of oil transport on the high seas. Part III discusses the CLCs and OPA, focusing first on practical problems with the statutes themselves in failing to create an effective liability regime. Part IV next focuses on the overall inadequacy of nation-state environmental regulation via the existing statutory regimes. Finally, Part V will discuss various market incentives, such as deregulation and route trading, as viable alternatives to super statutes.

This Note will argue that a permit trading scheme involving routes or launching and landing berths would provide a superior model for environmental regulation of oil spills than the current command and control structures imposed by the CLCs and OPA by promoting economic efficiency. Such a system would require governments to fix a set amount of oil that could be spilled within a certain timeframe. Working cooperatively, national governments would fix a total amount of oil that could be spilled per year and issue permits that would allow their holders to transport oil. Unlike command and control systems of pollution control, which assume that the implementation of Best Available Technology (BAT) on the part of individual transporters will somehow reduce overall pollution levels to an acceptable level,¹¹ a permit system will allow governments, environmentalists, and the market to adjust (and re-adjust) the total level of ambient pollution desired—and monitor compliance via pre-pollution permit trading, as opposed to post-pollution fines.¹²

10. Though some may argue that the CLCs and OPA are ineffective because liability caps for polluters are too low and also because—especially in the case of the CLCs—no single forum is made available for the adjudication of claims. However, even if legislative bodies were able to solve these problems through deliberation and more careful drafting, the CLCs and OPA remain fatally flawed because they fail to recognize that shipping regulation simply does not respond to traditional “command and control” legislation. See *infra* Part III and accompanying notes.

11. See, e.g., 33 U.S.C. § 2701.

12. See Clean Air Act, 42 U.S.C. §7410, for an example of how ambient pollution standards have been enacted in the context of ambient air pollution control.

II. HISTORY OF OIL POLLUTION LIABILITY AND CONTROL UNDER INTERNATIONAL LAW

Both European countries and the United States enacted oil pollution regulations in the 1800s. After the TORREY CANYON spill in 1969, which was, at that time, the worst oil spill in world history, several nations resolved to enact an international liability regime for oil spills. Although the United States participated in the convention producing the CLC of 1969, it declined to join, citing inadequate damage liability caps.¹³ Only much later, in 1990, did the United States enact its own liability scheme, the OPA of 1990, for oil spills. The OPA ironically has also been criticized for its inadequate damage caps.¹⁴ Although the caps exceed those of the CLCs, it remains clear that large-scale transporters can evade legal liability for major spills.¹⁵

A. Pre-1960s Oil Pollution Control

The United Kingdom became the first nation to enact water pollution legislation in 1814.¹⁶ The United States followed in 1866 with the Refuse Act, prohibiting the discharge of pollutants into New York Harbor.¹⁷ In 1899, the prohibition was expanded to include all navigable waters.¹⁸

Advancing technology and greater energy needs incited an explosion of world demand for oil during the first half of the 20th century.¹⁹ In 1924, the United States passed the Oil Pollution Act of

13. It should also be noted that concerns about federalism played a significant part in United States reluctance to adopt any of the CLCs' implementing protocols. Ratification would have pre-empted state liability laws in Oregon, Washington, Alaska, and any other state imposing liability above the federal limits. Damon L. Vickers, *Deterrence or Prevention—Two Means of Environmental Protection: An Analysis of the Oil Pollution Act of 1990 and Oregon Senate Bill 242*, 28 WILLAMETTE L. REV. 405, 410-12 (1992).

14. See *infra* note 51 and accompanying text.

15. As of Jan. 25, 2003, for example, Exxon Mobil remains the largest transporter of oil on world oceans. Ironically, the OPA—which was passed in response to the Exxon Valdez spill—would have been ineffective in holding Exxon legally accountable for cleaning up the latter because its damage caps are too low. However, with a market capitalization approaching \$200 billion, Exxon faces tremendous political pressure to clean up oil spills, even if no liability exists under any legal regime.

16. Jaclyn A. Zimmermann, Note, *Inadequacies of the Oil Pollution Act of 1990: Why the U.S. Should Adopt the Convention on Civil Liability*, 23 FORDHAM INT'L L.J. 1499, 1502 (2000).

17. *Id.*

18. *Id.*

19. *Id.*; see JOANNA BURGER, OIL SPILLS 19 (1997).

1924, making it illegal to dump oil into U.S. coastal waters.²⁰ In 1948, this was followed by the Federal Water Pollution Control Act, and, later, in 1966, by the first statutes attempting to address possible maritime environmental damage.²¹

B. *The TORREY CANYON Spill and the Civil Liability Convention of 1969*

On March 18, 1967, the oil supertanker TORREY CANYON grounded off the southwest coast of England, dumping 120,000 tons of heavy crude oil onto approximately 100 miles of the British and French coastlines.²² This disaster created unprecedented public interest and concern about the dangers of oil pollution from accidents aboard transporting ships and served as the impetus for passing the Comprehensive Liability Convention of 1969.²³ Although the vast majority of seafaring nations adopted the CLCs, the United States refused to adopt the convention.²⁴

The CLCs imposed strict liability on all ship owners transporting oil,²⁵ created a compulsory liability insurance requirement on ship owners,²⁶ and implemented a supplemental liability fund, IOPC, to which oil transporters must contribute.²⁷ After a spill, injured parties first attempt to recover damages by making claims under the CLCs; if amounts specified therein are inadequate, the IOPC is available to supplement their damage claims.²⁸

According to commentators in the United States, the liability caps under the CLCs continue to be inadequate to prevent major oil spills.²⁹ Under Article III of the Comprehensive Liability Convention of 1969, a ship owner can never be liable for more than a pre-determined amount, based on the size of his vessel.³⁰ Even the expansion of the maximum liability limits to \$169 million under the CLC's 1992 protocols was not sufficient to convince the United States to join the international community.³¹

20. Zimmermann, *supra* note 15, at 1502.

21. *Id.*

22. Browne Lewis, *It's Been 4380 Days and Counting Since Exxon Valdez: Is It Time to Change the Oil Pollution Act of 1990?*, 15 TUL. ENVT'L L.J. 97, 101 (2001).

23. Zimmermann, *supra* note 16, at 1507.

24. *Id.*

25. *Id.* at 1509.

26. *Id.*

27. *Id.* at 1510; see International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, Dec. 18, 1971, reprinted at 11 I.L.M. 284 (1972); with protocol, Nov. 19, 1976, reprinted at 16 I.L.M. 617 (1977).

28. *Id.*

29. Zimmermann, *supra* note 16, at 1510.

30. *Id.* at 1512, 1516.

31. *Id.* at 1513, 1519.

In March 2001, the International Maritime Organization (IMO) passed a new International Convention on Liability for Bunker Oil Pollution damage, presumably to supplement and fill liability gaps left by the CLCs.³² Prior to the enactment of the Bunkers Convention, ships carrying oil intended to be used for the operation or propulsion of the ship were not liable for causing pollution damage by spilling it.³³ This represented a significant gap since roughly half of all oil spills in international waters are bunker oil spills.³⁴ Under both the Bunkers Convention and the CLCs, ship owners are strictly liable for pollution damage caused by bunker oil spilled from their ships.³⁵ Unfortunately, liability limits under the Convention are undefined; national governments are left to set their own limits.³⁶ Adding to this confusion, the Bunkers Convention fails to track the CLCs in assigning liability for spills: under the latter, one person can be held liable for damages and clean-up, while the former contains provisions that hold several parties liable.³⁷ So, while the new Bunkers Convention attempts to fill gaps in the CLCs, it may simply superimpose an additional layer of confusion upon an already muddled liability scheme.

C. United States Response to the Need for Oil Pollution Control

Although the United States did not believe that the CLCs' liability caps were adequate to deter polluters, the U.S. Congress still realized that some sort of liability framework was needed.³⁸ Congress' first attempt to address this need was the Federal Water Pollution Control Act of 1970 (FWPCA).³⁹ This act declared a national policy prohibiting oil discharges and imposing civil penalties and strict liability for clean-up costs.⁴⁰ Under the FWPCA, responsible parties included owners, operators, or any onshore or offshore facility from which oil was discharged into or upon the navigable waters of the United States, the adjoining shorelines, or the waters of the contiguous zone.⁴¹ From an environmental perspective, the FWPCA's major weakness was that private parties could not recover damages or clean-up costs caused by an oil spill from a vessel.⁴² Private parties

32. See generally Chao Wu, *Liability and Compensation for Bunker Pollution*, 33 J. MAR. L. & COMM. 553 (2002).

33. See *id.* at 556.

34. See *id.* at 555.

35. See *id.* at 557.

36. *Id.* at 561.

37. *Id.* at 558.

38. See Zimmermann, *supra* note 16.

39. Lewis, *supra* note 22, at 108-09.

40. See 33 U.S.C. § 1321.

41. *Id.* § 1321(f)(1), (f)(2).

42. Lewis, *supra* note 22, at 103.

were instead required to rely on maritime tort principles to recoup their losses.⁴³ In other words, private parties could make no recovery for damages from polluters unless they could prove culpable negligence.⁴⁴ This was a far cry from the strict liability standard set out by the CLCs.

The passage of CERCLA in 1980 did not solve the problem. CERCLA was intended to create a broad liability scheme for damages caused by the release of hazardous substances into the environment.⁴⁵ The term "environment" included the navigable waters, waters of the contiguous zone, and ocean waters under U.S. jurisdiction.⁴⁶ However, the term "hazardous substance" specifically excluded oil and petroleum products.⁴⁷

Not until the EXXON VALDEZ disaster in March 1989, did Congress pass comprehensive oil spill liability legislation.⁴⁸ After striking a shoal on the sea bottom, the VALDEZ spilled 11 million gallons of crude oil and dispersed oil over 1,300 miles of the Alaska coastline.⁴⁹ The spill energized the public to spur Congress to pass—after fifteen years of deliberation—a comprehensive statutory scheme addressing oil spills.⁵⁰ It has been suggested that although the OPA was passed in response to a specific incident, it probably would not have prevented that incident had it been in effect at the time.⁵¹

The OPA's provisions dealing with liability differ markedly from those of the CLCs. Title I of the Act neither pre-empts conflicting state law nor adopts the international protocols.⁵² The OPA expands the liability and limitation programs of prior laws and addresses particular aspects of prevention, removal, and civil penalty programs.⁵³ Like the CLCs, the OPA created a supplemental fund to be used as compensation for losses not covered by polluters.⁵⁴ Unlike the CLCs, Congress did not cap liability, deciding instead to permit states to impose liability in addition to the federal liability,⁵⁵ though many states have failed to impose additional liability on oil

43. *Id.*

44. *Id.*

45. See 42 U.S.C. §§ 9601-9675 (1994).

46. *Id.* § 9601(8).

47. *Id.* §§ 9601(8), (14).

48. Lewis, *supra* note 22, at 108-09.

49. Zimmermann, *supra* note 16, at 1527. For a comprehensive account of the EXXON VALDEZ spill, see CONRAD SMITH, MEDIA AND APOCALYPSE: NEWS COVERAGE OF THE YELLOWSTONE FOREST FIRES, EXXON VALDEZ OIL SPILL, AND LOMA PRIETA EARTHQUAKE 77-114 (1992).

50. Zimmermann, *supra* note 16, at 1528.

51. See Bradley C. Bobertz, *Legitimizing Pollution Through Pollution Control Laws: Reflections on Scapegoating Theory*, 73 TEX. L. REV. 711, 725-34 (1995).

52. Lewis, *supra* note 22, at 109.

53. *Id.*

54. *Id.*

55. *Id.*

transporters.⁵⁶ Finally, the OPA limits liability exclusively to the owner, operator, or charterer of the polluting ship.⁵⁷ Again, unlike the CPC, oil companies who own the ship's cargo escape liability under the OPA, creating an escape valve for major oil companies who are able to divest themselves of their shipping operations.⁵⁸

D. Latest Developments

In November 2002, the tanker PRESTIGE broke in two and sank off the coast of Spain.⁵⁹ Its cargo was several hundred thousand tons of heavy industrial fuel oil for use in power plants.⁶⁰ Less than two months later, the Turkish tanker VICKY collided with a sunken carrier off the coast of France, spilling 70,000 tons of highly flammable kerosene.⁶¹ These accidents prompted the European Commission to propose additional legislation strengthening maritime safety, and underscore the deficiencies of the CLCs' liability scheme. The European Union proposed a prohibition on the transport of heavy fuels in single-hulled tankers in EU waters, in addition to a phase-out plan for existing single-hulled tankers.⁶² Such legislation would supplement the CLCs and bring EU law in line with similar provisions in the OPA.

These accidents have also prompted groups such as the World Wildlife Federation (WWF) to call for strict regulations concerning the condition of ships and the operation of shipping lanes.⁶³ WWF has asserted the need for regulating ship design, maintenance, and shipping routes.⁶⁴ Although the new legislation proposed by the EU will address some of the WWF's concerns with ship design and maintenance, it does nothing to address where ships are allowed to travel.⁶⁵ The OPA has a similar legislative void. Even if one assumes that single hull bans and forced phase-outs of older ships have a

56. For one possible explanation, see *supra* note 13 and accompanying text; see also Vickers, *supra* note 13, for a discussion of the possible conflicts between the OPA's liability provisions and those imposed by the State of Oregon.

57. OPA § 1001(32); 33 U.S.C. § 2701(32)(A) (Supp. V 1993).

58. See International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, Nov. 29, 1969, 1110 U.N.T.S. 57, 59.

59. BNA, *Daily Environment Report*, Jan. 6, 2003, available at <http://pubs.bna.com/ip/BNA/den.nsf/is/a0a6g9j9f6> (last visited Nov. 9, 2003).

60. *Id.*

61. BNA, *Daily Environment Report*, Jan. 9, 2003, available at <http://pubs.bna.com/ip/BNA/ied.nsf/is/A0A6H2U6D8> (last visited Nov. 9, 2003).

62. *Id.*

63. *Id.*

64. *Id.*

65. *Id.*

significant impact on spill reduction,⁶⁶ these provisions cannot be effective in their aims until shipping routes are controlled.⁶⁷

This Note will argue that shipping routes and port berths should be freely tradable in the marketplace. Functionally, this would be similar to the methodologies employed by the U.S. government in auctioning radio spectrum frequencies and selling landing slots to the major airlines.⁶⁸ Such a scheme could potentially achieve greater pollution control with significantly reduced transaction costs.

III. THE CLCS' AND OPA'S LIABILITY SCHEMES REMAIN INEFFECTIVE IN COMBATING OIL POLLUTION

Despite claims to the contrary, both the CLC and OPA have failed to prevent oil pollution and to compensate victims of that pollution, as evidenced by the recent spills of the PRESTIGE and VICKY.⁶⁹ Every year, thousands of oil spills are reported in U.S. and international waters.⁷⁰ From 1973 to 1984, the United States experienced between 9,000 and 12,000 oil spills per year.⁷¹ During that period, the total amount of oil released into the U.S. marine environment from oil spills ranged from a low of 8.2 million gallons in 1977 to a high of 21.5 million gallons in 1975.⁷² According to statistics maintained by the U.S. Coast Guard, there have been no spills of over one million gallons since 1990; however, the largest oil spill in the United States since 1996 occurred on November 28, 2000, when the WESTCHESTER spilled over 538,000 gallons of crude into the Mississippi River.⁷³

Although the volume of oil spilled in U.S. waters dropped by 70 percent, from 9.7 gallons per million spilled in 1990 to 2.7 gallons per million in 1999, it is unclear whether this decline is because of the internal pressures of the OPA's sanctions, or simply because external market pressures have forced developments such as equipment

66. This contention is controversial. The major objections against double hull construction include: (1) The potential for explosion because of gases trapped between the hulls; (2) the need for special emissions devices; (3) the possibility of water filling the space between the ruptured outer hull and the inner hull, causing the potential for increased spillage; and (4) the increased construction expense in relation to the risks incurred. Vickers, *supra* note 13, at 417-18.

67. BNA, *supra* note 61.

68. See *infra* Part V and accompanying notes.

69. See Lewis, *supra* note 22, at 98; see also Spillage Data available at <http://www.assembly.coe.int/Documents/WorkingDocs/doc03/EDOC9684.htm>.

70. Lewis, *supra* note 22, at 98.

71. *Id.*

72. *Id.* at 99.

73. *Id.*; see discussion *infra* note 75.

upgrades, better spill-avoidance technology, and more skilled crews.⁷⁴ Additionally, it must be noted that, although the total volume of oil spilled in U.S. waters declined during the 1990s, the number of major oil spills by tankers in international waters actually increased from ten between 1967 and 1989 to thirty between 1990 and 2000, indicating perhaps that large transporters of oil remain undeterred by the existing statutory regimes.⁷⁵

A. Internal Problems with the CLCs and OPA

Although there are multiple reasons why the CLCs and OPA have been ineffective in their lofty aims, two major problems with the structure of the laws that highlight why they have not had a greater impact on pollution control. First, liability limits under both regimes are too low to discourage major oil producers and transporters from taking all possible precautions to prevent spills. Second, neither regime provides a single forum for adjudicating damage claims. This leads to problems with conflicting laws, forum shopping, and other related enforcement problems.

The liability caps imposed by the CLCs and OPA are inadequate. As stated previously, the CLCs' liability provisions are limited.⁷⁶ The maximum liability under the 1992 Protocols is \$196 million.⁷⁷ In contrast, the maximum liability under OPA is \$350 million.⁷⁸ Under the CLCs, liability is strict and is limited no matter what the cause of the spill.⁷⁹ Under OPA, the responsible party cannot limit its liability if the oil spill was proximately caused by the gross negligence or willful misconduct of the party, its agent, employee, or person acting pursuant to a contract with a responsible party.⁸⁰ In addition, if the oil spill is caused because one of those parties violated a federal safety, construction, or operation regulation, the responsible party cannot limit its liability under the statute.⁸¹ Finally, the OPA does

74. BNA, *Daily Environment Report*, Jan. 10, 2003, available at <http://pubs.bna.com/ip/BNA/den.nsf/is/a0a6h3z5a9> (last visited Nov. 9, 2003).

75. See The Mariner Group, *Oil Spill History*, at <http://www.marinergroup.com/oil-spill-history.htm> (last visited July 23, 2003). Notably, the worst oil spill in United States history since the EXXON VALDEZ occurred on November 28, 2000, when the WESTCHESTER spilled over 538,000 gallons of crude oil into the Mississippi River, closing a busy shipping route for 26 miles and threatening pelicans, shorebirds, seabirds, crabs, shrimp, sport fish, and over 100,000 wintering waterfowl. *Id.*; see *supra* note 73 and accompanying text.

76. Zimmermann, *supra* note 16, at 1512.

77. *Id.* at 1513.

78. 33 U.S.C. § 2704(a)(4) (2003). Notably, the EXXON VALDEZ remediation has cost over \$2 billion to date, an amount that far exceeds the liability imposed by both the CLCs and the OPA. See *infra*, note 84 and accompanying text.

79. Zimmermann, *supra* note 16, at 1512.

80. See 33 U.S.C. § 2704(c)(1)(A).

81. See *id.* § 2704(c)(1)(B).

not limit or pre-empt state laws which may impose additional liability.⁸²

Neither of the liability schemes embraced by the CLCs or the OPA is sufficient in terms of providing punitive economic incentives to avoid oil pollution. Exxon Mobil, for example, made \$191 billion in gross profits in 2002.⁸³ Even at its most onerous, the OPA's liability scheme would fail to impact that profit margin significantly, suggesting that the law fails to create sufficient pecuniary incentives for large transporters to avoid spills. Simple arithmetic suggests that, from a purely economic perspective, Exxon Mobil could annually safely absorb several disasters comparable in size to EXXON VALDEZ and still remain profitable.⁸⁴ The liability schemes embraced by the CLCs and OPA are little more than a minor economic concern for major oil producers.⁸⁵ Exxon, for example, spent over \$2 billion to clean up the Prince William Sound area after the VALDEZ spill—an amount far exceeding its OPA liability—and that area still has not completely recovered from the adverse effects of the spill.⁸⁶ This suggests that economic liability alone would not be sufficient to compel Exxon to continue its remediation efforts in the effected area.⁸⁷ Instead, market and political concerns would likely play a more powerful part in creating incentives for pollution control than would the current super statutes' regulatory regimes, which are based on insufficient attempts at economically punitive-style damages.⁸⁸

Additionally, neither the CLCs nor the OPA provide by itself an answer to the question of jurisdiction over claims. The CLCs' attempt to preempt any nation's contrary laws regarding oil pollution by preempting national laws and superseding all other international conventions.⁸⁹ The 1992 Protocols expand the geographic range of the

82. See *id.* § 2718(a)(2) (2003); *Ballard Shipping Co. v. Beach Shellfish*, 32 F.3d 623, 630-31 (1st Cir. 1994).

83. See financial data for Exxon Mobil, available at <http://uk.biz.yahoo.com/p/xom.html> (last visited Nov. 11, 2003). For statutory liability caps on oil spill damages, see 33 U.S.C. § 2704(c)(1).

84. Assuming Exxon's clean-up costs reach as much as \$3 billion, its overall profits (even if all clean-up costs were absorbed in a single fiscal year) for any given year would be reduced by less than 2 percent, based on profits from the most recent fiscal year. See *supra*, note 83; *infra*, note 86 and accompanying text.

85. See Bobertz, *supra* note 51, at 732 ("Without the threat of statutory liability, oil companies that previously shipped their own cargo might discontinue that practice and divest themselves of their shipping interests, draining the funds available for safety measures. . .").

86. Lewis, *supra* note 22, at 127-28.

87. See *id.*

88. See Bobertz, *supra* note 51, at 733 ("[Exxon's] efforts to save wildlife and to spray and wipe oily beaches probably had as much to do with restoring its tarred public image as they did with restoring the ecological integrity of Prince William Sound.").

89. See CLC, 973 U.N.T.S., *supra* note 3, art. XII.

CLCs from the territorial sea of a member nation to the exclusive economic zone of a member nation.⁹⁰ By expanding the scope into this ethereal netherworld, the CLCs purport to expand the grounds for recovery. If a vessel spills oil into CLCs' waters, then CLCs' provisions apply, regardless of whether the ship owner is a citizen of a member nation.⁹¹ The major difficulty here is that CLCs' provisions do not apply to the vessels of member nations outside of CLCs' waters.⁹² Therefore, if a spill occurs in a non-CLCs state's territorial waters, such as the United States, the CLCs provisions do not apply.⁹³ Finally, CLCs judgments will not necessarily be enforceable if a ship owner travels to a non-CLCs jurisdiction to escape liability.⁹⁴

The OPA fails for different reasons. The OPA does not preempt state oil pollution laws or specify a single forum for the adjudication of claims.⁹⁵ Because conflicting state statutes pose different liability schemes on each other (and in relation to the OPA), the party responsible for the spill will be unable to predict the possible outcome of his case.⁹⁶ Although Congress's stated goal was to create a comprehensive and predictable liability scheme, it has instead added to the confusion because multiple schemes, leading to forum shopping and lack of judicial economy because judges have less experience—and thus are unable to gain expertise—in dealing with OPA claims.⁹⁷

Because Congress chose neither to adopt the CLCs nor to preempt state laws, the United States has no set means for establishing jurisdiction over foreign ship owners who spill oil in U.S. territorial waters.⁹⁸ States face little hope of compelling foreign ship owners to comply with their own liability statutes.⁹⁹ Even if jurisdiction can be obtained, state judicial systems face significant barriers, such as delay and litigation expenses.¹⁰⁰ Finally, unlimited liability statutes—as imposed by state legislatures—are unlikely to be insured against by underwriters.¹⁰¹

90. *Id.*; see also Protocol to Amend the International Convention on Civil Liability for Oil Pollution Damage, *supra* note 3, art. 3.

91. Zimmermann, *supra* note 16, at 1514.

92. *Id.*

93. *Id.*

94. See *id.* at 1538.

95. Lewis, *supra* note 22, at 127.

96. *Id.*

97. *Id.*

98. Vickers, *supra* note 13, at 421.

99. *Id.* Problems faced by United States states include difficulties establishing jurisdiction over foreign parties and administrative expenses.

100. *Id.*

101. *Id.*

B. External Problems Circumvent Meaningful CLCs and OPA Revisions

Simon Cripps, director of WWF's endangered seas program, has stated that

Three main factors affecting the risk of shipping disasters are the design of ships, the maintenance of ships and the controls on where ships can go. If you get one of these things wrong, you can have a disaster on your hands. It seems that in the case of the PRESTIGE, all three factors had a role in what went wrong.¹⁰²

In the OPA, Congress attempted to address design and maintenance issues by gradually phasing out older tankers and requiring that new tankers and retrofits be insulated with double, instead of single, hulls.¹⁰³ The OPA calls for the phaseout of all single-hull tankers by 2010 unless they get retrofitted with double bottoms or sides, in which case they can operate until 2015.¹⁰⁴ The CLCs contain no such requirement, although EU nations have determined, based on the recent PRESTIGE and VICKY spills, that the implementation of a double-hull requirement would be desirable.¹⁰⁵

Although a full analysis of whether or not the implementation of double hulls has itself significantly reduced oil pollution is beyond the scope of this Note, it does bear mentioning that the topic is controversial.¹⁰⁶ In a Senate Commerce, Science, and Transportation Committee hearing on January 9, 2003, Paul Pluta, Coast Guard commandant for marine safety, security, and environmental protection, admitted that he did not know whether a single factor such as the double-hull requirement was responsible for the decline in oil spills during the last several years.¹⁰⁷ Probably, he admitted, the spill was due to a combination of factors.¹⁰⁸

Because it is difficult, if not impossible, to analyze each factor contributing to the decline in oil spills separately, it is likewise difficult to analyze why—or whether—the OPA and CLCs have by themselves improved the quality of the environment on the high seas. It is important to realize that new technologies, including electronic navigational charts from the National Oceanic and Atmospheric Administration, have played a role in greater maritime safety and awareness.¹⁰⁹ Heightened safety concerns following the EXXON

102. BNA, *supra* note 59.

103. OPA, 33 U.S.C. at § 4115.

104. BNA, *supra* note 74.

105. BNA, *supra* note 61.

106. See *supra* note 66 and accompanying text.

107. BNA, *supra* note 74.

108. *Id.*

109. *Id.*

VALDEZ accident probably also have led to greater employee training and awareness.¹¹⁰

Finally, neither of the legal regimes imposed by the OPA and CLCs say anything about where ships can travel. Tankers can travel through and spill oil and petroleum products in waters previously designated as Potentially Sensitive Shipping Areas (PSSAs).¹¹¹ Although the laws of a particular country may impose fines or other penalties on such behavior, the after-the-fact punishment is often inadequate in that it does nothing to repair any potentially irreparable damage that has been done to the environment. As experience has shown, the damage done in major oil spills cannot often be easily undone.¹¹²

Perhaps the major failing of both the CLCs and the OPA is that they are "grounded in the notion that fear of penalty will deter vessel and facility owners and operators from engaging in undesirable activities."¹¹³ The liability provisions of both acts are not triggered until spills actually pollute the ocean; thus, the laws are toothless until the very behavior they seek to deter—environmental damage—has been done, often at irreversible levels.¹¹⁴ Unless one assumes that economic sanctions alone are sufficient to deter polluters—a rather dubious assumption—then we must realize that after-the-fact fines cannot and will not compel polluters to change their behavior.¹¹⁵

IV. FAILURE OF THE PUBLIC CHOICE MODEL IN CONTEXT OF CLCs AND OPA

Although a full discussion of the fallacies of public choice theory as applied to environmental law is beyond the scope of this Note, suffice it to say it is an important area in the context of oil pollution prevention.¹¹⁶ As Richard Revesz has noted, "The dominant view in

110. See generally Thomas A. Birkland, *In the Wake of the Exxon Valdez: How Environmental Disasters Influence Policy*, Environment (Sept. 1998), available at http://www.findarticles.com/cf_dls/m1076/n7_v40/21058620/pnnt.jhtml (last visited Nov. 12, 2003) (suggesting that greater operational efficiency was a by-product of the EXXON VALDEZ spill).

111. BNA, *supra* note 59. A Potentially Sensitive Shipping Area (PSSA) has been defined by the IMO as an area within the shipping lanes that is particularly susceptible to environmental damage, due mainly to sensitive populations of marine life.

112. See SMITH, *supra* note 49.

113. Vickers, *supra* note 13, at 431.

114. See *id.*

115. See *supra* Part III.A and accompanying notes.

116. For an overview of important work in the academy dealing with the application of Public Choice ideology to federal government regulation, see generally Richard Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553 (2001); MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION:

the legal academy on the allocation of responsibility for environmental regulation favors federal regulation on the ground that public choice pathologies cause environmental interests to be systematically underrepresented at the state level relative to business interests.”¹¹⁷ However, he goes on to explain why there are severe problems with the public choice assumption in the context of environmental law.¹¹⁸

The most common claim by public choice theorists seems to rest on the assumption that, the federal government is a better environmental regulator than individual states because the latter are unduly susceptible to the pressures of interest groups hoping to gain lax pollution control standards.¹¹⁹ If a particular industry group, such as a large oil company, hopes to obtain less stringent regulation, it will simply locate its operations in a state bent on mollifying this particular company, or attracting its business away from another state with more stringent pollution control laws.¹²⁰ The difficulty is that many scholars advocating this view fail to explain why these problems would be solved by federal regulation.¹²¹ Indeed, several states, counties, and municipalities have adopted various environmental statutes that go far above and beyond the pollution control mandated by federal law.¹²²

The creation of the CLCs and the OPA followed a model advocated by public choice theorists for decades, namely, that federal regulation of the environment is inherently good.¹²³ The failure of the CLCs and OPA to achieve an acceptable measure of oil pollution control should call these assumptions into question. Environmentalists and governments should perhaps re-focus their efforts toward creating market-based and, by necessity, smaller scale goals. As decentralization of environmental regulation is increasingly becoming a political reality, it is necessary to consider alternative approaches for meeting protectivist environmental goals.¹²⁴ Because the current centralized approach to oil pollution regulation based on

PUBLIC GOODS AND THE THEORY OF GROUPS 5-65 (1971); GERALD MARWELL & PAMELA OLIVER, THE CRITICAL MASS IN COLLECTIVE ACTION: A MICRO-SOCIAL THEORY 41-48 (1993); Steven P. Croley, *Theories of Regulation: Incorporating the Administrative Process*, 98 COLUM. L. REV. 1, 13-15 (1998); Daniel A. Farber, *Politics and Procedure in Environmental Law*, 8 J.L. ECON. & ORG. 59, 60 (1992); Christopher H. Schroeder, *Rational Choice Versus Republican Moment—Explanations for Environmental Laws, 1969-73*, DUKE ENVTL. L. & POL'Y F. 553, 566 (1997); BRUCE A. ACKERMAN & WILLIAM T. HASSSLER, *CLEAN COAL, DIRTY AIR* (1981).

117. Revesz, *supra* note 116, at 555-56.

118. *See id.* at 557.

119. *Id.* at 559.

120. *See id.*

121. *Id.*

122. *See id.* at 585.

123. Revesz, *supra* note 116, at 557.

124. *See id.* at 557-58.

super statutes has not been completely successful, and since the current regime is increasingly unlikely to succeed in today's legal and political climate, perhaps it is time to explore various market-based incentive systems, such as a pollution permit trading program.¹²⁵

V. MARKET INCENTIVES AS A VIABLE ALTERNATIVE TO "SUPER STATUTES"

As indicated previously, the current legal and political climate of environmental deregulation on an international scale makes it increasingly unlikely that super statutes like the CLCs and OPA will remain in favor.¹²⁶ Inherent problems with the underlying theory of environmental regulation are creating fallacies and causing lawmakers to overlook other possible solutions.¹²⁷ This section will deal with the possibility that the free market itself may be a viable source of environmental regulation in the oil pollution context.

"Pollution trading" became fashionable in the 1990s as a way to promote efficiency and democracy, and to lower the costs associated with traditional command and control environmental regulation.¹²⁸ In trading, the government markets permits that allow firms to pollute the environment.¹²⁹ The most popular use of this system is arguably the emissions trading program enacted by Congress during the Clinton Administration.¹³⁰ First, the government decided on a permissible pollution level, after which permits were issued accordingly. A firm wishing to exceed the ambient air emissions standard set by the government had the choice of either adopting rigorous technology standards or simply purchasing an offset—a right to pollute—contained in one of the aforementioned permits.

Trading differs from command and control regulation in terms of its enforcement emphasis:

In a command and control system, the government dictates the technology that must be installed to control pollution; it need not make a precise decision about the total amount of pollution that it will allow. The decision regarding the level of pollution is an implicit one: to allow that amount of pollution which remains after all relevant firms have installed the requisite technology. In contrast, to create a pollution

125. For some ideas about how to do this, see *infra* Part V and accompanying notes.

126. See *supra* Part III and accompanying notes.

127. See *supra* Part IV and accompanying notes.

128. Lisa Heinzerling, *Selling Pollution, Forcing Democracy*, 14 STAN. ENVTL. L.J. 300, 301 (1995); see Ackerman & Stewart, *supra* note 7, at 1341-51; Richard B. Stewart, *Controlling Environmental Risks Through Economic Incentives*, 13 COLUM. J. ENVTL. L. 153, 158-62 (1988).

129. See generally Ackerman & Stewart, *supra* note 7.

130. See generally *id.*

trading system, the government must first explicitly decide how much pollution to permit.¹³¹

From the standpoint of promoting efficiency, the adoption of a similar trading system by international seafaring nations could have a positive impact on the world's oceans by allowing the market to allocate responsibility for oil pollution control on a cost-for-use basis.¹³² The creation of a market-based permit trading system, similar to that created under the Clean Air Act amendments, would be one way of accomplishing a market-based system of oil pollution regulation.¹³³ Rather than focusing on clean-up and remediation after a spill occurs, a system of permit trading would encourage oil transporters to implement appropriate pollution control technologies to prevent spills from occurring in the first place. This proactive market-based approach would focus on consumers and the environment, rather than on the administrative bottleneck imposed by command and control legislation.

A. Law and Economics in an Environmental Context

The economic rationale for market-based pollution control is based on the concept that pollution itself is an economic problem that can be solved through conventional market mechanisms.¹³⁴ The "standard economic account," according to Lisa Heinzerling, suggests that firms will not spend money to protect the environment because "collective goods," such as air and water, are shared in common by all people.¹³⁵ By investing money to keep the environment clean, firms benefit free-riding individuals other than their customers, hence the latter are unwilling to pay the full cost of benefits because they do not accrue for their sole benefit.¹³⁶ "Collective goods' often lead to 'externalities': the environmental consequences of unregulated market transactions are not reflected in price, and as such, these consequences, and their effects on others, are not taken into account in market behavior."¹³⁷

A.C. Pigou first suggested a solution to the problem of externalities by proposing a tax on externality-producing activities.¹³⁸ The tax would permit the external costs of the goods to be internalized upon consumption.¹³⁹ In the context of environmental

131. Heinzerling, *supra* note 128, at 302.

132. See *infra* Part V.A-B and accompanying notes.

133. *See id.*

134. Heinzerling, *supra* note 128, at 305.

135. *Id.*

136. *Id.*

137. *Id.*; A.C. PIGOU, THE ECONOMICS OF WELFARE 129-30 (1960).

138. PIGOU, *supra* note 137, at 129-30.

139. *Id.*

law, the government would have to identify all of the various environmental impacts of a given activity, and then place a price tag, or tax, on that activity.¹⁴⁰ In theory, the tax would compensate for the collective goods discrepancy reflected in the market since all consumers would be forced to bear the full social cost of their behavior via this tax.¹⁴¹ By equating the private cost of a polluting activity with its social cost, the tax would enable the market to achieve the optimal allocation of collective goods.¹⁴²

Ronald Coase and others have criticized Pigou for ignoring the interchangeable nature of harms involved, and for creating a system in which it is objectively impossible to determine the proper amount of "tax" to be assessed to polluters.¹⁴³ Coase argued that in balancing the rights of a group of citizens to clean air against the right of a factory to pollute, one must balance the harm caused by the factory's polluting activity against the citizens' harm to the factory's activities.¹⁴⁴ This balancing of economic interests suggests that rational individuals will bargain amongst themselves for the most efficient allocation of resources; the Pigouian "tax" becomes superfluous.¹⁴⁵

Coasean theory is of particular relevance to the context of oil pollution prevention.¹⁴⁶ Coase theorized that, where there are no transaction costs and where there is perfect information, rational individuals will bargain to reach an efficient allocation of resources, regardless of whether it is the polluter or the polluted who receives the initial entitlement.¹⁴⁷ Similarly, oil companies, ship owners, and other potential oil polluters have a vested interest in acting rationally to prevent pollution. As rational economic actors, responsible parties, given the proper incentives and lack of onerous government regulation, will choose to act responsibly in preventing pollution, simply because pollution reduction will be a more efficient means of achieving the end goal of profitability.¹⁴⁸ In the context of air pollution emissions trading, studies have shown that permit trading programs reduce pollution at a lower cost than do command and control regimes, largely because firms are able to choose whatever means of compliance is most cost-effective for them: firms may either employ reasonable pollution-control technology or, if this is too

140. *Id.*

141. *Id.*

142. *Id.*

143. See generally Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960).

144. *Id.*

145. *Id.*

146. See *id.*; A. MITCHELL POLASKY, AN INTRODUCTION TO LAW AND ECONOMICS 11-14 (2d ed. 1989).

147. Coase, *supra* note 143, at 8-15.

148. *See id.*

expensive, buy permits from other firms.¹⁴⁹ In the oil pollution control context, such a system would be preferable to the current command and control regime because it would permit oil transporting firms with low compliance costs to overcomply and sell their permits to firms with higher compliance costs, thus ensuring the lowest cost, most efficient means of achieving the desired water pollution level.¹⁵⁰

As several scholars have suggested, the government could simply adopt a two-step policy in the area of social risks and social harms, as applied to environmental law.¹⁵¹ Because people and firms would be able to purchase freely tradable permits to pollute, those who reduced their pollution below the threshold level would be able to trade their so-called pollution rights for cash from firms who were unable to do the same.¹⁵² As Professor Sunstein writes:

In one bold stroke, such a system would create market-based disincentives to pollute and market-based incentives for pollution control. Such a system would also reward rather than punish technological innovation in pollution control, and do so with the aid of private markets. Very generally, and quite outside the environmental area, it makes sense to think about programs of this sort for regulation of harmful behavior.¹⁵³

In the context of oil companies, transporters would purchase permits very similar to those issued to firms under the Clean Air Act amendments. First, individual governments, either of the United States or international nation-states, would determine an environmental standard specifying the total number of gallons per year that could be spilled in the world's oceans without incurring the need for monetary compensation or remediation.¹⁵⁴ Each government then could establish a pool of permits and allocate them to relevant oil transporting firms.¹⁵⁵ Every firm would be required to hold these permits to account for potential spills occurring during the transport of oil, but they would be allowed to freely buy, sell, and trade the permits amongst themselves; those most able to create and implement pollution control technology would be able to sell their permits to those who have less ability and financial resources.¹⁵⁶

149. See, e.g., R. Andrew Muller & Stewart Mestelman, *Emission Trading With Shares and Coupons: A Laboratory Experiment*, 15 ENERGY J. 185 (1994).

150. See Heinzerling, *supra* note 128, at 308. See generally J.H. DALES, POLLUTION, PROPERTY AND PRICES (1968).

151. See Cass R. Sunstein, *Democratizing America Through Law*, 25 SUFFOLK U. L. REV. 949, 964-66 (1991). See generally Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law: The Democratic Case for Market Incentives*, 13 COLUM. J. ENVTL. L. 171 (1988).

152. See Sunstein, *supra* note 151, at 965.

153. *Id.*

154. Cf. Heinzerling, *supra* note 128, at 301 (discussing similar scheme in context of Clean Air Act amendments).

155. *Cf. id.*

156. *Cf. id.*

Each government would retain overall control over the process by specifying how much pollution could occur, and by issuing a set number of permits according to its determination.¹⁵⁷

In searching for other appropriate analogies to shipping, it is compelling to examine regulated industries in the United States, such as airlines and communications airwaves.¹⁵⁸ The reason underlying regulation of these particular industries is, in both fact and purpose, similar to the reason international shipping could be effectively regulated: an abundance of access to the resource leads to a tragedy of the commons: too many self-interested firms and individuals acting for themselves in detriment to the common environment. As Garrett Hardin described:

The tragedy of the commons develops in this way. Picture a pasture open to all . . . As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks, 'What is the utility to *me* of adding one more animal to my herd?' This utility has one negative component and one positive component.

1. The positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is nearly +1.
2. The negative component is a function of the additional overgrazing created by one more animal. Since, however, the effects of overgrazing are shared by all the herdsman, the negative utility for any particular decision-making herdsman is only a fraction of -1.

Adding together the component partial utilities, the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to the herd. And another; and another...But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit—in a world that is limited. Ruin is the destination toward which all men rush, each

157. Cf. *id.*

158. One potential problem with the proposal in this Note concerns how governing bodies would police the quantity of oil spilled on the open sea by purchasers of "pollution permits." Presumably, oil pollution must be visible in order to be specifically tracked by a regulating body. Since any potential polluter would suffer a reduction in profits due to an obligation to purchase offsetting pollution permits, there would be a strong incentive to underreport oil pollution that is not visible to outside observers. If such "chiseling" could be detected easily, then potential polluters would have a powerful legal incentive to comply with the law. Here, however, it is very likely that the cost of proving liability for non-compliance with a permit would be very costly. In this case, the problem must become part of the solution: the regulator must contract to control the standard of pollution by building in the costs of monitoring or bonding arrangements into the cost of the permit itself. Since visibility would be both costly to monitor, and a source of exploitation for polluters, an acceptable range of pollution permitted seems more viable in practice than setting specific "drop-dead" pollution targets. For an informative analogy, see discussion of so-called "best efforts" contractual provisions in CHARLES J. GOETZ, LAW AND ECONOMICS 354-57 (1984); see also *infra* note 229 and accompanying text.

pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.¹⁵⁹

The fear of totally unregulated radio waves is based on this very premise—that the resource itself could be destroyed by overuse.¹⁶⁰ In radio broadcasting, the perceived threat is that, like the ocean, there is a finite amount of available airspace for the transmission of radio waves.¹⁶¹ Theoretically, a totally deregulated radio broadcasting industry would eventually pollute the limited bandwidths available with static and interference.¹⁶² To guard against this possibility, the Federal Communications Commission (FCC) created a system of allocating and distributing radio frequencies in blocks, and monitoring the airwaves via classic command and control mechanisms.¹⁶³ But Thomas P. Hazlett writes that traditional property law provides a more effective regulatory mechanism than bare command and control regulation:

Private owners spontaneously assess consumer benefits in nuanced profit calculations (trading costs against revenues), while regulators tend to make categorical decisions. [Federal regulators use] an economically crude and technically obsolete framework to separate various services in frequency space . . . [T]he system is clearly inept at maximizing consumer welfare, as vast portions of spectrum space are left vacant and virtually all the remaining portions are underutilized . . . [Government interference by means of] public interest allocation historically has been based on the claim that radio spectrum is a unique resource that cannot be regulated by standard means such as property rights. Not only is this proposition theoretically false . . . , but it is operationally incorrect, as radio spectrum users under public interest regulation rely on de facto private property rights to limit interference. Market forces constrain private parties to respect lines drawn by regulators.¹⁶⁴

Although it is tempting to think of command and control regulation as being mandated by the scarcity of a particular resource, i.e. the airwaves, the truth is that—like the airline and shipping industries—the abundance and ease of access to those airwaves are factors making government command and control regulation extremely inefficient in practice.¹⁶⁵ Ronald Coase succinctly described the problem with using scarcity as a factor justifying regulation in his

159. Garrett Hardin, *The Tragedy of the Commons*, 168 SCI. 1243, 1244 (1968).

160. Cf. *id.* (demonstrating that destruction of the pasture necessarily follows overgrazing).

161. Cf. *id.*

162. Cf. *id.*

163. See Thomas W. Hazlett, *The Wireless Craze, the Unlimited Bandwidth Myth, the Spectrum Allocation Faux Pas, and the Punchline to Ronald Coase's "Big Joke": An Essay on Airwave Allocation Policy*, 14 HARV. J.L. & TECH. 335 (2001).

164. *Id.* at 373-74.

165. See *id.* at 484.

critique of Justice Felix Frankfurter's Supreme Court opinion in *NBC v. United States*.¹⁶⁶

[T]hese arguments . . . are based on a misunderstanding of the nature of the problem. Mr. Justice Frankfurter seems to think that federal regulation is needed because radio frequencies are limited in number and people want to use more of them than are available. But it is a commonplace of economics that almost all resources in the economic system (and not simply radio and television frequencies) are limited in amount and scarce, in that people would like to use more than exists . . . It is true that some mechanism has to be employed to decide who, out of many claimants, should be allowed to use the scarce resource. But the way this is usually done in the American economic system is to employ the price mechanism, and this allocates resources to users without the need for government regulation.¹⁶⁷

Professor Hazlett observes, "Instead of regulation being mandated by a peculiar form of *scarcity*, open access to spectrum is mandated by a peculiar form of *abundance*. It is inefficient . . . to promote property rights [in the spectrum]. Technology dictates that spectrum should be kept open to all."¹⁶⁸ This follows Coase's belief that resources should be allocated according to market forces rather than government decisions, chiefly because of two major hurdles the government faces: first, the lack of precise monetary measures of cost and benefit provided by the market; and second, the fact that it cannot possess all relevant information possessed by the managers of each and every business which uses or might use the resource, to say nothing of consumer preferences for various goods and services which might flow from that resource.¹⁶⁹

The spectrum allocation system consists of a resource, much like the world's oceans, that cannot be owned by any party.¹⁷⁰ When governments attempt to regulate access to either, they are attempting to police the resource for the benefit of its citizens. As a result, a tragedy of the commons emerges: citizens are, at least, the nominal "owners" of both the spectrum and the seas; however, they are individually detached from the management of their "property," leading to a tremendous waste of their tax dollars, and of the resources themselves, by the government.¹⁷¹ Effective control of the resource belongs to whatever special interest group has been successful in tilting government decision-makers toward their cause.¹⁷² Hazlett suggests that, instead of subjecting resources to

166. *NBC v. United States*, 319 U.S. 190 (1943).

167. Ronald H. Coase, *The Federal Communications Commission*, 2 J.L. & ECON. 1, 14 (1959).

168. Hazlett, *supra* note 163, at 484.

169. Coase, *supra* note 167, at 18.

170. See generally Hazlett, *supra* note 163.

171. See generally *id.*

172. See *id.* at 400.

administrative scrutiny by means of a command and control legal regime, rules should be made that “encourage innovation and competitive entry” into the market.¹⁷³

Beginning in 1993, Congress permitted the FCC to auction radio licenses on a competitive basis, creating this type of “competitive entry.”¹⁷⁴ The policy, Hazlett continues, has resulted in the creation of important efficiencies, three of which are directly applicable in the oil transportation context: first, reduced rent-seeking behavior; second, reduced delays in the administrative process; third, more efficient “taxation.”¹⁷⁵ A permit trading program giving oil transporters a tradable right to dock at particular ports, combined with liability for the route traveled to that port, would have a similar effect by reducing the race to transport oil from point A to point B at all costs, including the failure to take the proper safety precautions to prevent environmental damage.¹⁷⁶ Additionally, it would demystify the process for pursuing environmental damage claims in court, because the owner of a permit would be responsible for any damage caused on route to its permitted docking destination; liability would be strict and not open to the uncertainties of multiple jurisdictions and conflicting laws.¹⁷⁷ Finally, the buying and selling of “docking permits” would be a more efficient means of raising revenue to combat current and future environmental problems than would the current methodology of charging fines to remediate spills that have already occurred.¹⁷⁸

Eli Noam has proposed that, like airline routes in the sky, airwaves should be freely shared with no exclusive rights.¹⁷⁹ Since jetliner routes are non-scarce goods, new unobstructed routes may be freely claimed: planes avoid other planes, for obvious reasons.¹⁸⁰ It is only where competing claims arise, such as the right to take off and land, that the need to create a property interest comes about.¹⁸¹ In the United States, rights to take off and landing slots at major airports have been well established and freely tradable for many years.¹⁸² Noam proposes that airwave access rights should not be auctioned to high bidders who are purchasing “control over a specific slice of the rainbow.”¹⁸³

173. *Id.*

174. See *id.* at 399-400.

175. See *id.* at 462.

176. See generally Hazlett, *supra* note 163.

177. See generally *id.*

178. See generally *id.*

179. Eli Noam, *Spectrum Auctions: Yesterday's Heresy, Today's Orthodoxy, Tomorrow's Anachronism*, 41 J.L. & ECON. 765, 765 (1998).

180. See *id.* at 765-66.

181. *Id.* at 784-85.

182. *Id.* at 780-81.

183. *Id.* at 769.

So, if the current command and control structures do not work in terms of the case studies mentioned—airlines, communications, and oil transportation—then what should replace it? The clear choice made by the scholars cited here seems to be that a property right that favors consumers would be far superior to the current legal regimes imposed because rights promote economic efficiency and simultaneously discourage rent-seeking behavior.¹⁸⁴ Richard Posner writes that laws promoting economic efficiency are a powerful force driving the law: “The efficiency theory of the common law is not that every common law doctrine and decision is efficient. . . . The theory is that the common law is best (not perfectly) explained as a system for maximizing the wealth of society.”¹⁸⁵

In the context of oil transportation, the creation of a marketable permit trading system would promote greater efficiency in oil transport and lower economic and environmental costs associated with spills.¹⁸⁶ Risks would be undertaken by the transporters, with the understanding that spill liability and remediation would be their own responsibility.¹⁸⁷ Significantly, profit calculations by firms would include the opportunity costs of potential spills.¹⁸⁸ Third party agents, such as insurers, would indemnify firms against potential liability only after taking reasonable steps to ensure environmental safety and compliance.¹⁸⁹ “Efficient mitigation” by oil transporters would lower the cost of insurance coverage and simultaneously improve the technology used to reduce oil spills.¹⁹⁰

Although the analogy between airwave rights, airlines, and oil transporters seems obvious, it is worth mentioning at least one counterpoint to the argument for creating a marketable property right for oil transporters. George Gilder writes: “You can no more lease electromagnetic waves than you can lease ocean waves. . . . You can use the spectrum as much as you want as long as you don’t collide with anyone else or pollute it with high powered noise or other nuisances.”¹⁹¹ Again, the similarity between the spectrum, air, and ocean seems rather easy to grasp; here, Gilder merely parrots the well-worn truism that one cannot regulate anything that one cannot completely control.¹⁹² Given the relative success of tradable take-off and landing slots in the airline industry, it seems obvious that the

184. Hazlett, *supra* note 163, at 404 (citing RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 21 (3d ed. 1986)).

185. *Id.*

186. Cf. generally Hazlett, *supra* note 163 (discussing similar trading system in the context of spectrum).

187. Cf. generally *id.*

188. Cf. generally *id.*

189. Cf. generally *id.*

190. See *id.* at 404-05.

191. George Gilder, *Auctioning the Airwaves*, FORBES, Apr. 11, 1994, at 98, 111.

192. See *id.*

property rights that are regulated and traded—and to which value is assigned in the market—are those that *can* be completely controlled.¹⁹³

Like radio waves and airline traffic, oil tankers must effectively manage their business within a common-pool resource.¹⁹⁴ The abundance of the resource in question—the ocean—may serve to create an artificial sense of security until an oil spill occurs. Unlike the herdsman's pasture in Hardin's tragedy of the commons, the ocean can most likely be used by seafarers without depleting the resource itself; however, there can be severe incidental consequences to the misuse of the resource.¹⁹⁵ For this reason, it makes much sense to follow the examples provided by the communications and airline industries in the United States and create some sort of marketable trading system, wherein routes, and landing and launch berths at major international ports are auctioned to the highest bidder. Ronald Coase would likely agree with the premise that a pricing system allowing free trade of the ocean's resources would prompt the most efficient economic outcome by providing the highest and best users a property right via the free market.¹⁹⁶

B. Possible Solutions: Using Economics as a Springboard for Legal Reform

Accepting Coase's normative premise, as rational economic actors, responsible (i.e. potentially polluting) parties must be given economic incentives to act responsibly in preventing oil pollution.¹⁹⁷ This may happen in several ways, all of which involve removing current market constraints. A pure economic analysis would suggest removing all barriers by completely deregulating oil pollution control.¹⁹⁸ Although this is unlikely to succeed for numerous practical, legal, and political reasons, it can be used as a baseline for suggesting solutions to the problem of oil pollution. The chief problem with total deregulation is that the ocean is ultimately a finite resource that has a symbiotic relationship with most—if not all—

193. See Noam, *supra* note 179, at 765, 770.

194. See *supra* note 159 and accompanying text.

195. See *id.*

196. See generally Ronald H. Coase, *Comment on Thomas W. Hazlett: Assigning Property Rights to Radio Spectrum Users: Why Did FCC License Auctions Take 67 Years?*, 41 J.L. & ECON. 577 (1998).

197. See *supra* note 128 and accompanying text.

198. See *id.* This is not to suggest that a Coasean world is one in which total economic "deregulation" would be favored as a means of avoiding problems with externalities. Rather, this Note uses the concept of deregulation broadly to encompass the notion of reinventing government by changing existing control paradigms rather than totally removing them.

living things on the earth.¹⁹⁹ The main difficulty with total deregulation is that the incentives for pollution will outweigh the incentives not to pollute, for reasons discussed above.²⁰⁰ But is the present regulatory system really a better solution than deregulation? The current regime imposed by the CLCs and OPA "wastes tens of billions of dollars every year, misdirects resources, stifles innovation, and spawns massive and often counterproductive litigation."²⁰¹ On the other hand, it seems almost Panglossian to argue that a world of totally unregulated pollution would be optimal simply because clean-up would involve enormous transaction costs.²⁰² Another possibility to consider is the fact that the market itself and the desire for greater profits could serve to incentivize pollution-controlling behavior on the part of responsible parties.²⁰³ Simple competition may force companies to reduce oil pollution, at least to a point.²⁰⁴

Tax impositions for pollution control and the development of new pollution-controlling technology may be one alternative to total deregulation.²⁰⁵ This would be a form of "payment" to be made by potentially responsible parties that would serve to incentivize pollution control.²⁰⁶ Taxes have been effective in other contexts for encouraging responsible behavior; this would simply be an extension of that paradigm.²⁰⁷ The difficulty with pollution taxes is that they run headlong into the classic Pigouian dilemma: How does one place an objective price tag on pollution? For example: Imagine that we wanted to determine the appropriate amount of tax to charge for, say, 1,000 gallons of oil spilled per year. We know that oil spilled in the ocean has an adverse effect on marine life by directly poisoning fish and birds, and by preventing certain species of plankton from receiving air and light from the water's surface. Additionally, we know that oil sullies the beaches and may have both direct and indirect effects on human and animal life on land adjacent to the polluted water. Assuming we can determine how much 1,000 gallons of oil contributes to each specific harm mentioned above, we still would have to place a monetary valuation on that harm. Overall, the market cannot provide us with answers to these questions.²⁰⁸

199. See POLASKY, *supra* note 146.

200. See *supra* note 159 and accompanying text.

201. Ackerman & Stewart, *supra* note 7, at 1333.

202. See generally *id.*; E.J. Mishan, *Pangloss on Pollution*, 73 SWED. J. ECON. 1 (1971).

203. See *id.*

204. See BRIAN BIX, *JURISPRUDENCE: THEORY AND CONTEXT* 192-94 (2d ed. 1999).

205. See *id.*

206. See generally Heinzerling, *supra* note 128.

207. See generally *id.*

208. This example modeled after Heinzerling, *supra* note 128, at 306.

One may, however, be able to implement a tax based on a pre-determined pollution standard. William Baumol and Wallace Oates designed a tax based on reducing pollution below a certain threshold level, pre-determined via established political processes.²⁰⁹ Given the uncertainty of environmental impacts and costs, the goal that their tax would achieve would be somewhat "arbitrary."²¹⁰ Given that fact, they advised that the tax be imposed only on pollutants that met three conditions: 1) they must cause severe harm; 2) the harm can be controlled at reasonable cost; and 3) the harm decreases as the pollutants' level decreases.²¹¹ Theoretically, then, the benefits of their system would roughly approximate their costs.²¹²

At first blush, it seems that this proposal would not work well in the context of oil pollution prevention for two reasons. First, the pecuniary damage from major spills can reach into hundreds of millions, and sometimes, billions of dollars—hardly a "reasonable cost" by any measure; and second, the environmental harm caused by oil pollution damage does not necessarily decrease as the oil is abated.²¹³ In the Prince William Sound area, Exxon has spent \$2 billion and counting to remediate the damage from the EXXON VALDEZ spill, and the environmental impacts have, very likely, not been completely assessed or appreciated to date.²¹⁴

A better alternative seems to be the marketable emissions permit trading system proposed by J. H. Dales.²¹⁵ Under Dales's proposal, the government would administer pollution permits that reflect an aggregate pollution limit set by the government, which firms could freely buy, sell, and trade.²¹⁶ This system, he argued, would be superior to Baumol and Oates's tax because the permits would directly enforce the government's pollution limit through the number of permits issued, rather than indirectly enforcing a nebulous tax based on compliance costs.²¹⁷ Dales's proposal comes very close to the system implemented by the Clean Air Act amendments.²¹⁸

The most important qualification to be made in the context of oil pollution is that the total amount of savings from a hypothetical

209. See *id.* at 307; William J. Baumol & Wallace E. Oates, *The Use of Standards and Prices for Protection of the Environment*, 73 SWED. J. ECON. 42, 44 (1971).

210. Baumol & Oates, *supra* note 209, at 47-48.

211. WILLIAM J. BAUMOL & WALLACE E. OATES, THE THEORY OF ENVIRONMENTAL POLICY 172-75 (2d ed. 1988).

212. See *id.*

213. Cf. *id.* (discussing tax in context of air pollution).

214. See Judge Reduces Award In Exxon Valdez Case, WALL ST. J., Dec. 9, 2002, at A13; Jim Carlton, Exxon May Face More Payments From Alaska Spill, WALL ST. J., Oct. 1, 2003, at A2.

215. See DALES, *supra* note 150, at 93-97.

216. *Id.*

217. *Id.*

218. Heinzerling, *supra* note 128, at 309.

permit trading program is largely dependent upon many factors, such as the type of pollutant being regulated, the extent of existing pollution control technology available, and the level of pollution control currently deemed practicable and desirable.²¹⁹ Additionally, administrative and initial implementation costs of any potential program could fatally outweigh any potential benefits.²²⁰ In terms of oil pollution, the ocean itself is a vast resource that would present many inherent administrative difficulties in implementing a viable permit program. Governments would have to delineate clear boundaries and territorial areas over vast distances, and then set standards for the maximum pollution permitted over these distances. Rather than thinking of the ocean as a series of roads, analogous to overland travel, it may be more feasible to control the frequency of docking at particular ports, as well as creating standards for pollution at and near those ports.²²¹ In this way, an oil pollution permit trading system would resemble both the Clean Air Act emissions trading scheme, and the current regulatory structure imposed by the United States government on the airline and communications industries.²²²

The solution for oil pollution control that most closely resembles both Dales's proposal and the current air pollution permit program under the Clean Air Act amendments would be a mandatory permit trading program, adopted and administered by the governments of individual nations.²²³ Essentially, oil and petroleum transporters would purchase permits to use specific ports for the loading and transportation of cargo, gaining perhaps an exclusive right to use that port for a particular period, similar to current airline and communications regulation.²²⁴ Along with the privilege of using the port would come the responsibility for any spills that occur, either in port or on route. In essence, transporters would be purchasing a freely tradable property right à la Dales, which could be regulated by both external (market) and internal (legal) forces.²²⁵ Under this regime, governments could limit the type of ship, or the cargo being carried, within a Particularly Sensitive Shipping Area (PSSA), or any other area subject to environmental damage.²²⁶ It is generally accepted today in regulatory contexts that "resources are most likely to receive the appropriate level of conservation" when "they are protected by well-defined property rights" because resources that are

219. *Id.* at 310.

220. *Id.*

221. *Cf. id.* (discussing permitting in context of air pollution).

222. *Cf. id.* at 309-10.

223. *Cf. id.* Theoretically, nations would act individually after making a collective decision regarding enforcement standards, adjudicatory mechanisms, and the like, similar to the processes that produced the CLCs.

224. *Cf. Heinzerling, supra* note 128.

225. *Cf. id.*

226. *Cf. id.*

jointly owned tend to be overused, resulting later in a lack of investment.²²⁷

Water quality trading in the United States is not a new concept. In May 2002, the EPA published a proposed Water Quality Trading Policy, which would offer incentives to states, Indian tribes, and companies to comply with the requirements of the Clean Water Act.²²⁸ In a water quality trade, one polluter reduces its discharges below the regulatory level and, in exchange, receives a "credit" that can be sold to another polluter that cannot afford the same level of pollutant reduction.²²⁹ Most water quality trading programs consist of: pollutant baselines and reduction goals, a statement of eligible pollutants and polluters, the definition of geographic boundaries, and various systems and processes to ensure effective administration, enforcement, and tracking of pollutant trades.²³⁰

Naturally, some difficulties would crop up in an oil pollution trading system modeled after the "typical" water quality trading programs under the U.S. Clean Water Act.²³¹ First, decisions would have to be made by international lawmaking bodies concerning the definition of acceptable pollutant data quality and quantity standards.²³² Perhaps this would necessitate the creation of a specialized administrative tribunal of experts, who would be appointed by their respective nation-states in conjunction with previously agreed-upon standards.²³³ Second, there would be significant cost restrictions, based on the need to administer such a program, set pollution baselines, negotiate and document permit trades, and conduct pollution monitoring via consistent water quality tests.²³⁴ Since major oil transporters are the primary beneficiaries of this plan, perhaps it would make sense to require them to bear some of the administrative costs.

Whatever the preferred method of attainment, it is clear from an economic standpoint that a loosening of the regulatory noose would create a more efficient system of oil pollution control. It is widely accepted that government planning and intervention generally lead to an inefficient allocation of resources and spawn rent-seeking behavior on the part of various interested parties.²³⁵ Additionally,

227. Christopher S. Yoo, *Vertical Integration and Media Regulation in the New Economy*, 19 YALE J. REG. 171, 246 (2002).

228. Water Quality Trading Policy, 67 Fed. Reg. 34,709 (May 15, 2002).

229. Alexandra Dapolito Dunn, *Water Quality Trading: Bringing Market Forces to Bear in Watersheds*, 17 NAT. RESOURCES & ENVT 137, 137 (2002).

230. *Id.*

231. See *id.* at 138.

232. See *id.*

233. See Hazlett, *supra* note 163, at 551-53.

234. See Dunn, *supra* note 229, at 138.

235. See Hazlett, *supra* note 163, at 531.

there is strong evidence in some sectors that this inefficiency hinders the development of new technology.²³⁶

Bruce Ackerman and Richard Stewart have argued that some market-based regulatory measures have the effect of requiring public debate in the context of creating overall pollution limits.²³⁷ One of the consequences of this debate may be to require governments to assess their coastlines to identify environmentally sensitive areas as PSSAs. Although the International Maritime Organization (IMO) set out in 1992 to identify these PSSAs, only five have been created, including the Great Barrier Reef in Australia.²³⁸ PSSAs are supposed to receive special protection through action of the IMO for their ecological, cultural, or scientific significance, and their vulnerability to damage from shipping activities, but the IMO has only limited capability to police violations.²³⁹ Although the CLCs, in theory, should create a liability scheme for oil polluters who damage PSSAs, they contain no specific provisions to that effect.²⁴⁰

Many scholars would argue that command and control legislation often fails to eradicate environmental problems such as this because the very structure of the regulatory scheme prevents them from having this impact; the emphasis is not on efficiency of outcomes, but on retaining control of the process itself.²⁴¹ Aside from merely creating efficient economic outcomes, then, permit trading may provide a forum for resolving sensitive or complicated public debates about the environment.²⁴²

Notably, the process of deregulation promoted in this Note would serve the democratic process well by encouraging debate about the proper pollution standards. In the permit process outlined above, world governments would issue permits that would be traded in the open market; however, prior to the issuance of such permits, governments would have to determine what levels of oil pollution in the oceans were acceptable.²⁴³ Such determinations would not be possible without an involved and engaged electorate.²⁴⁴ The system proposed would not simply remove the government from the decision-making process, it would simply involve the latter at a different stage of the game.²⁴⁵

236. See *id.*

237. See Ackerman & Stewart, *supra* note 7, at 1337-40; Ackerman & Stewart, *supra* note 151, at 175-77. But see generally Heinzerling, *supra* note 128.

238. BNA, *supra* note 59.

239. *Id.*

240. *Id.*

241. See *supra* Part IV and accompanying notes. See generally Revesz, *supra* note 116.

242. See generally Ackerman & Stewart, *supra* note 7.

243. Cf. generally *id.* (discussing similar economic incentives for pollution control).

244. Cf. generally *id.*

245. Cf. generally *id.*

Finally, I offer a few words about the enforcement of my proposed market-based regulatory plan. In writing about the inadequacies of the current airwave spectrum allocation policy, Thomas Hazlett suggests that perhaps the FCC should be replaced by a Spectrum Court that would govern all spectrum disputes based on a broad statutory declaration that “all non-interfering entry [to the spectrum] is lawful and that private property rights to radio waves may be registered with the Spectrum Court.”²⁴⁶ In theory, this court would have a special expertise in spectrum matters, and would resolve controversies based on standard market protections of property, contract, and antitrust law.²⁴⁷ Such a system would work well in the oil transportation regime proposed in this Note. After permits are purchased and sold by transporters, the market and the common law would serve to protect and enforce their rights.²⁴⁸ Governments of the world would be compelled to work together to establish a cooperative judicial body to administer disputes. Unlike the CLCs and the OPA, there would be internal consistency in such an arrangement. Very likely, the greater economic efficiency of market permit trading would be accompanied by increased judicial efficiency, leading to more predictable outcomes in disputes and a greater chance for achieving just results.

VI. CONCLUSION

It remains highly doubtful that the OPA and CLCs have by themselves reduced the amount of oil spilled by tankers into the world’s oceans.²⁴⁹ This is partially due to statutory defects in the laws themselves, but also because of serious problems with the underlying reasoning that created those laws. As the air emissions trading program has demonstrated, market forces and economic incentives will have as great as, or greater, an effect on controlling oil pollution than the existing command and control statutory schemes by promoting efficiency and rational economic action.²⁵⁰ Drawing this conclusion requires making the assumption that a carrier transporting oil on the high seas is analogous to a factory emitting sulphur dioxide, at least in the sense that the pollution level can be predicted and controlled.²⁵¹ Additionally, one must assume that the model of selling airwave access rights or airline landing slots is

246. Hazlett, *supra* note 163, at 551-53.

247. *See id.*

248. *Cf. id.* (discussing market and common law protections in context of a proposed spectrum court).

249. *See supra* Part III and accompanying notes.

250. *See Coase, supra* note 143.

251. *See Heinzerling, supra* note 128, at 306.

sufficiently analogous to shipping to provide a useful model.²⁵² Although both analogies are far from perfect, they do provide a baseline set of economic assumptions for modeling a solution to the very serious problem of oil pollution control and prevention in international waters.

Although both U.S. and foreign governments have taken steps to regulate oil spills and impose liability on polluters via super statutes, lawmakers and courts have consistently admitted that state and federal regulation may not be adequate to prevent environmental damage caused by oil spills.²⁵³ In *United States v. Locke*, for example, Justice Kennedy conceded that, given the tremendous mass of oil transported by tankers, the oil's proximity to marine life, and the destructive power of oil itself, "international, federal, and state regulation may be insufficient protection," if a spill occurs.²⁵⁴ Since the political branches of government appear more interested in perpetuating themselves and shifting the focus of this problem onto one another, we cannot assume that the current command and control regime will accomplish anything beyond maintaining the current status quo. On the other hand, oil transporters, concerned with economic factors as well as the satisfaction of consumers, are simply better situated to manage pollution control via market mechanisms. Freely tradable permits, issued by the government based on its determination of acceptable pollution levels, would allow oil transporting firms the freedom and incentive to 1) create better pollution control technology and pollution preventive measures; 2) police their own behavior via market mechanisms; and 3) avoid the rent-seeking behavior that inevitably accompanies command and control regimes.²⁵⁵

The prevention of oil spills will remain a serious issue as long as tankers continue to be used on the open sea. Although the demand for tankers is down, largely because pipelines are used to transport petroleum products, the world's tanker fleet remains the chief source for transporting oil and petroleum products.²⁵⁶ As long as there are ships transporting oil over the seas, humankind shall need an effective and efficient way to regulate their activities. The system of permit trading proposed in this Note is not perfect, and its implementation would be subject to numerous administrative and

252. This analogy seems quite reasonable, given that airwave access rights, airline regulation, and ambient air pollution control—like oil pollution control—are government-regulated industries of finite resources. For a more complete discussion on the proposed analogy between airwave access rights and airline regulation, see generally Hazlett, *supra* note 163.

253. See, e.g., *United States v. Locke*, 529 U.S. 89, 117 (2000).

254. *Id.*

255. See *supra* notes 210-11 and accompanying text.

256. BNA, *supra* note 74.

political challenges. However, the system proposed here would, in theory, prevent pollution of the world's oceans by encouraging efficiency and technological innovation, as opposed to the inefficiency of the current system's after-pollution payment regime. My hope is to influence the political process; to suggest a fresh approach to a problem in great need of a new perspective.

*Michael A. de Gennaro**

* J.D. Candidate, 2004, Vanderbilt University Law School. B.A., City College of the City University of New York. The author wishes to thank Ariadne de Gennaro, J. Michael Showalter, Michael Vandenbergh, and Christopher Yoo for helpful comments in preparation of this project. This Note is dedicated to my father, Tom de Gennaro.