2002

Major Terrestrial Causes of Marine Coastal Pollution: A Critique of Current Regulation and the Suggestion of an Alternative Approach to Regulation

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UNPUBLISHED

I. Introduction

Our ocean's are at risk! This is the proclamation of the PEW Ocean's Commission, stated in a report due out in 2003.[1] The report suggests nonpoint source discharge from agricultural operations is the primary contributing factor to United States coastal water pollution.[2] The report calls for increased measures at reducing nonpoint source pollutants on a national scale.[3]

Numerous federal regulations have attempted to control nonpoint source pollution. Relevant sections of the Clean Water Act (CWA),[4] amendments to the Coastal Zone Management Act (CZMA),[5] and the Farm Bill[6] are examples. However, these regulations have failed to adequately address this growing problem.

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[1] ***See generally,*** **Boesch, Donald F. et al.,** ***Marine Pollution in the United States: Significant Accomplishments, Future Challenges*****, Pew Oceans Commission, Arlington, VA. (2002).**
[2] ***Id. at ii.***
[3] ***Id.***
[4] ***See*** **Claudia Copeland,** ***Water Quality: Implementing the Clean Water Act*****, Cong. Research Serv., January 9, 2002,** ***at http://www.cnie.org/NLE*** **(last visited Aug. 3, 2002).**
[5] **16 U.S.C.A. §1455(b).**

Reasons why these regulations have failed are varied. Some rely on defective control measures. Others lack tough regulations and enforcement mechanisms. Finally, some are limited in their scope of regulated entities.

What is needed is a comprehensive regulatory mechanism that combines effective regulation and enforcement, while taking into consideration the "external" forces exerted by nonpoint dischargers on the political community. This regulatory mechanism must be broad enough to cover all potential dischargers. However, it must also allow for variations in the regulatory mechanism on a case-by-case basis.

The purpose of this article is to identify agricultural operations as the major source of marine pollution, and present an argument for an alternate regulatory mechanism to properly control these sources. First, causes of marine pollution will be identified. Then, existing federal regulations will be reviewed and criticized. Some emphasis will be placed on §303 of the CWA, and the Total Maximum Daily Load (TMDL) program suggested by EPA. It will be used as a case study to show why ambient-based regulations are ineffective at controlling pollution sources.

Limitations on other regulatory programs will be identified and explained. An alternate form of regulation encompassing a "technology with alternatives" approach will be suggested and criticized. This alternate form of regulation will be differentiated from other proposed forms of regulation. Finally, an example of a cooperative solution being implemented in Idaho will be discussed. The reasons for its success will be analyzed and compared to the "technology with alternatives" approach.

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[6] **16 U.S.C.A. §1221.**

II. Causes of Marine Pollution

"The most widespread and measurable effect of pollution on marine organisms in U.S. coastal waters is eutrophication caused by nutrient loading."[7] Eutrophication is a process whereby ocean waters are inundated with nutrients, primarily nitrogen and phosphorus.[8] The nutrients serve as a "horn of plenty" for tiny marine plants known as phytoplankton.[9]

Phytoplankton are the primary producers, or "starting point," in a hierarchal foodchain, representing the basic food source for marine life. Phytoplankton, in actuality, are small plants. Just like terrestrial plants, they require nutrients like nitrogen and phosphorus for growth.

Numerous marine organisms depend on phytoplankton as a food source for their survival.[10] When there is an excess of nutrients, the phytoplankton population grows exponentially, leading to an imbalance in the marine foodchain.[11] The surge in

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[7] ***Id.,*** **note 1.**
[8] ***Id.***
[9] ***See*** **Boesch, D.F., and R.B. Brinsfield, *Coastal Eutrophication and Agriculture; contributions and solutions*, Biological Resource Management: Connecting Science and Policy, pgs. 93-115 (2000).**
[10] ***Id.***
[11] ***Id.***

phytoplankton growth leads to increased numbers of their primary predators, zooplankton.[12]

Zooplankton are tiny marine organisms that feed on phytoplankton. However, they are animals, rather than plants. As such, they use oxygen to breathe. Vast accumulations of these animals can deplete the water of its oxygen reserves. The result is conditions of hypoxia, or severe oxygen depletion, in the coastal waters around the U.S.[13] Since fish and other oxygen breathing marine organisms cannot survive in these areas, they become unproductive "dead zones."[14] The implications are severe for industries such as fishing and tourism.[15] Other implications of eutrophication include habitat destruction and development of toxic algal blooms.[16]

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[12] Copepods are the most common form of zooplankton found in the marine environment. They serve as a primary food source for numerous aquatic organisms. One such species is the small shrimp commonly referred to as krill. Krill are noted as the primary source of sustenance for many baleen whale species. Fishermen often refer to copepods as "red feed" or "cayenne" in reference to the scarlet hue on their transparent bodies. *See* Deborah Cramer, *Great Waters: An Atlantic Passage*, W.W. Norton and Company, New York / London, pg. 30 (2001).

[13] *Integrated Assessment of Hypoxia in the Northern Gulf of Mexico*, National Science and Technology Council, Committee on Environment and Natural Resources, Washington D.C. (2000).

[14] *Id.*

[15] Caddy, J.F., *Toward a Comparative Evaluation of Human Impacts on Fishery Ecosystems of Enclosed and Semi-Enclosed Seas.* Reviews in Fishery Science, Vol.1, pgs. 57-95 (1993).

[16] *See* Boesch, *Supra* note 1, pg. 20.

1. Sources of Nitrogen Enrichment

So where are the nutrients coming from? To answer this question, we must first look at all potential sources of nitrogen and phosphorus. Moreover, since background levels of natural nutrient loading in the marine environment have remained constant over time[17], we will focus our discussion on made-made contributions.[18]

Current sources of nutrient enrichment in U.S. coastal waters include: discharges from wastewater treatment plants; nutrients found in airborne emissions from power plants, auto exhaust and industrial smokestacks; runoff and groundwater from croplands; urban and suburban storm water; and farm animal wastes.[19] We will examine each source individually, and discuss the effectiveness of current regulation on controlling discharges.

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[17] ***See generally,*** **Castro, M.S. et al., *An Assessment of Nitrogen Loads to U.S. Estuaries with an Atmospheric Perspective*. American Geophysical Union, Washington D.C. (2000). *See also* Boesch, *supra* note 16:**

> **"Globally, the amount of biologically available nitrogen added to the biosphere each year has more than doubled the amount made available by the natural sources of plant fixation and lightning."**

[18] **National Resource Council: *Clean Coastal Waters, Understanding and Reducing the Effects of Nutrient Pollution*, National Academy Press, Washington D.C. (2000) (explaining how human activities have increased the amount of nitrogen reaching the world's oceans by a factor of four to eight over natural rates).**

[19] ***Id., supra* note 1.**

a. Discharges from Wastewater Treatment Plants

Discharges from wastewater treatment plants are considered discrete, or point sources of pollution under the Clean Water Act (CWA).[20] Point Sources are strictly regulated by the CWA.[21] Specifically, these discharges are subject to a permitting system whereby effluents must be treated with Best Available Technology (BAT) before being discharged into the environment.[22]

Results of CWA regulation on primary treatment of wastewater show a substantial reduction in environmentally harmful discharges, specifically including organic chemicals such as nitrogen, which affect biological oxygen demand.[23] However, there are still problems associated with the discharge of nitrogen after primary and secondary treatment of wastewater. In general, secondary treatment of wastewater only removes one-third of nitrogen.[24]

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[20] **33 U.S.C. §§ 1251-1387 (1994). The CWA defines point source as:**

> **any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. *Id.***

This term does not include agricultural stormwater discharge and return flows from irrigated agriculture.

[21] ***Id.***

[22] ***Id.***

[23] ***See*** **Boesch, *supra* note 1, pg. 6.**

[24] ***See generally*****, National Resource Council, *Managing Wastewater in Coastal Urban Areas*, National Academy Press, Washington D.C. (1993). *See also*, National**

Stronger requirements placed on nitrogen treatment through a BAT standard would likely lead to a reduction in biologically available nutrients that are commonly found in marine nutrient enrichment.[25] In fact, advance treatment technologies, capable of eliminating up to ninety-seven percent of the nitrogen, are being implemented in regions susceptible to nutrient enrichment from direct discharge of wastewater.[26]

Although some nutrients are currently being deposited from wastewater discharges, the overall data suggests direct regulation controls employed under the CWA are limiting nutrient input.[27] Since the inception of the CWA in 1972, the discharge of organic wastes from industrial and municipal sources has declined due to improved treatment.[28] Further, advances in technology are allowing for additional reductions of discharges in nutrient sensitive areas.[29] Thus, it is likely the "command-and-control" regulations under the CWA are working to limit point-source wastewater discharges of nutrients.

Resource Council: ***Clean Coastal Waters, Understanding and Reducing the Effects of Nutrient Pollution*****, National Academy Press, Washington D.C. (2000).**

[25] ***Id.***

[26] ***Id.***

[27] ***Id.***

[28] ***See*** **Boesch,** ***supra*** **note 1, pg.20.**

[29] ***Id. supra*****, note 24.**

b. Nutrients found in Airborne Emissions from Power Plants, Auto Exhaust, and Industrial Smokestacks

Emissions from power plants, auto exhaust, and industrial smokestacks are regulated under a number of federal and state laws.[30] The overall success of these regulations remains to be seen. Currently at issue is the extent to which nitrogen oxide emissions from power plants and vehicles are contributing to nutrient enrichment in the oceans.[31]

Atmospheric sources of nitrogen come in the form of NOX, or nitrogen oxide.[32] This form of nitrogen is carried through the air and deposited into the oceans through a process known as "atmospheric deposition.[33]" In aggregate, this form of "nitrogen loading" can be substantial.[34] In certain areas, atmospheric deposition of nitrogen exceeds agricultural sources.[35]

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[30] ***See generally*, The Clean Water Act, 33 U.S.C. §§ 1251-1387 (1994). Also, *see generally,* The Clean Air Act, 42 U.S.C. 7401 et seq.**

[31] ***See* Boesch, *supra* note 1, 24-28.**

[32] **Paerl, H.W. and Whitall, D.R. *Anthropogenically-Derived Atmospheric Nitrogen Deposition, Marine Eutrophication and Harmful Algal Bloom Expansion: Is there a link?* 28 Ambio 307-311 (1999).**

[33] ***Id.***

[34] ***Id.***

[35] **Castro, M.S. et al. *Contribution of Atmospheric Deposition to the Total Nitrogen Loads to Thirty-four Estuaries on the Atlantic and Gulf Coasts of the United States,* pgs. 77-106. Located in, *An Assessment of Nitrogen Loads to U.S. Estuaries with an Atmospheric Prospective,* American Geophysical Union, Washington D.C. (2000) (referring to the estimated nitrogen loadings in the following bays: Massachusetts; Narragansett; Long Island Sound; New York Harbor; Barnegat; and Barataria-Terrebonne Bays).**

Overall, however, atmospheric deposition of nitrogen from fossil fuels in vehicles and power plants has stabilized over much of the United States as a result of pollution control measures enacted under the Clean Air Act.[36] Moreover, this trend, as well as future efforts to improve air quality, should result in meaningful reductions.[37]

c. Urban and Suburban Stormwater

Municipal discharges are regulated as point sources under the Clean Water Act.[38] However, due in large part to urban sprawl[39], there is a significant amount of non-point discharges emanating from urban and suburban stormwaters.[40] Runoff occurs when suburban developments take the place of natural land.[41] The permeable soil, which produces relatively little runoff, is converted into impermeable roads and parking lots, resulting in substantial runoff.[42] The rate at which urban sprawl is occurring, especially near the coasts of the United States, is exceeding population growth.[43]

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[36] *See generally,* U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, N.C., *Deposition of Air Pollutants to the Great Waters: Third Report to Congress.* EPA-453-R-00-005 (2000). It is important to note the Clean Air Act has adopted a technology-based system of regulation.

[37] *Id.*

[38] 33 U.S.C. §§ 1251-1387 (1994)

[39] The term "urban sprawl" can be defined as follows: the expansion of an urban area into areas of countryside that surround it.

[40] *See* Boesch, *supra* note 1, 29-30.

[41] *Id.*

[42] *Id.*

[43] *Id.* For an excellent discussion of urban sprawl implications for marine coastal environments, *see generally,* Beach, Dana, *Coastal Sprawl: The Effects of Urban*

Stormwater runoff also occurs when municipal sewage treatment centers, using combined sewer overflow systems[44], cannot handle the amount of water entering the system.[45] Administrators are forced to close access to the system. This allows the untreated sewage, along with stormwater, to flow directly into nearby watersheds and coastal zones.[46] Congress has attempted to place stricter regulations on municipal stormwater discharges in the past.[47] However, because many municipalities were financially unable to meet the new regulations, EPA has limited implementation and relaxed requirements placed on the municipalities.[48] More recently, municipalities have received additional funding from the federal government for implementation of technology-based controls.[49]

New technologies can incorporate local changes in planning and construction methods. This would include installation of retention ponds that capture and hold runoff until it percolates into the groundwater, and preservation of buffer zones of undisturbed

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Design on Aquatic Ecosystems in the United States, **Pew Oceans Commission, Arlington, VA. (2002).**

[44] **Combined sewer overflows occur in situations where domestic sanitary sewage, industrial wastes, infiltration from groundwater, and stormwater runoff are all collected simultaneously. These are treatment systems that combine all of the aforementioned sources of discharges. Advances in treatment, and updating the carrying capacity of these systems will help to prevent stormwater runoff problems.**

[45] ***See generally*** **Claudia Copeland, *Stormwater Permits: Status of EPA's Regulatory Program*, June 10, 1998, *at http:// www.cnie.org /nle/crsreports/water/h2o-26.cfm* (last visited Aug. 29, 2002).**

[46] ***Id.***

[47] **Water Quality Act of 1987, 33 U.S.C.A. § 1342(p).**

[48] **40 C.F.R. §122.26(d) (1993).**

[49] ***See*** **Boesch, *supra* note 1, 30.**

areas along waterways to retain runoff from impervious regions.[50] In addition, techniques in housing developments, such as "clustering," help reduce the amount of impervious roads needed for housing.[51] Undoubtedly, such measures will aid in pollution management from stormwater runoff.

Effective stormwater runoff management is occurring through technological innovations, including installation of separate sanitary sewers as well as temporary holding facilities. Urban sprawl raises different issues, and will likely only be resolved through management policies combining technological advances and building management practices as a means of controlling diffuse discharges of pollutants.

d. Runoff and Groundwater From Croplands

"Within nonpoint sources of pollution, near unanimous agreement exists that agricultural nonpoint source pollution is the largest contributor."[52]

The source of nutrients in croplands starts at the stage of fertilization, continues through the nitrogen-fixing process of plants, and ends as animal wastes.[53] During the

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[50] ***See generally,*** **Beach, Dana,** ***Coastal Sprawl: The Effects of Urban Design on Aquatic Ecosystems in the United States,*** **Pew Oceans Commission, Arlington, VA. (2002).**

[51] ***Id.***

[52] ***See*** **Drew L. Kershen,** ***Agricultural Water Pollution: From Point to Nonpoint and Beyond*****, 9 Natural Resources & Environment 3, 3 (1995).**

[53] ***See*****, National Resource Council:** ***Clean Coastal Waters, Understanding and Reducing the Effects of Nutrient Pollution*****, National Academy Press, Washington D.C. (2000).**

process, over-fertilization, poor management of crop development, and excess animal consumption all lead to substantial nutrient loading into nearby watersheds.[54]

Nationally, approximately 20 percent of the nitrogen fertilizer in North America leaches directly into waters.[55] Crops remove approximately sixty-five percent of the remainder in a process known as "nitrogen fixation."[56] Once the nitrogen is "fixed" in the form of a plant, it remains stable. However, approximately 70 percent of the crops harvested are then fed to animals instead of humans.[57]

Once the crop is digested, the nitrogen is transformed from a "fixed" state to a potentially "mobile" state as manure.[58] If this manure is not managed properly, it then is subject to direct discharge into nearby waterways. Recent studies estimate the amount of nitrogen reaching water bodies from animal wastes probably exceeds that from fertilizer runoff.[59]

e. Farm Animal Wastes

Farm animal wastes, a byproduct of agricultural activities, account for the majority of nutrient loading in coastal marine environments.[60] "Nationally, agriculture is the most extensive source of water pollution, affecting seventy percent of impaired rivers

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[54] ***Id.***
[55] ***Id.***
[56] ***Id.***
[57] ***Id.***
[58] ***Id.***
[59] ***See*** **Boesch,** ***supra*** **note 1, 29.**
[60] ***See*** **Kershen,** ***supra*** **note 52.**

and streams, and forty-nine percent of impaired lake areas."[61] This is based on a "bottom-line" assessment stating fifty percent of the nations watersheds are polluted, including some 1,500 water bodies that did not meet water quality standards.[62] Direct discharge of manure into coastal waters is a significant contributing factor. Livestock raised on American farms and ranches produce approximately 1.8 billion metric tons of manure each year, most of which reaches surface water supplies.[63] How is the manure, and thereby nitrogen, reaching surface waters? One method of direct transport is through confined animal feeding operations (CAFO's).

Confined animal feeding operations are becoming more popular in certain areas, especially the dairy and meat industries.[64] Farmers are doing away with the "grazing" ideology, and opting instead to confine their animals in relatively small areas in high concentrations.[65] Feed, usually corn mixed with animal remains, is shipped in to sustain the animals.[66] The wastes generated by the animals accumulate in a small area on land

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[61] *See* OLIVER A. HOUCK, THE CLEAN WATER ACT AND TMDL PROGRAM: LAW, POLICY, AND IMPLEMENTATION, ELI, 85 (1999), Quoting US EPA, Clean Water Action Plan: *Setting the Stage; Successes, Challenges, and New Directions*, 8-9 (visited Feb. 26, 1998) <http://www.epa.gov/cleanwater/action/cla.html.>.

[62] *Id.*

[63] *See* David Zaring, *Agriculture, Nonpoint Source Pollution, and Regulatory Control: The Clean Water Act's Bleak Present and Future*, 20 HARV.ENVTL.L.REV. 515, 519 (1996). *See also* EPA , Report to Congress; Nonpoint Source Pollution in the United States, 2-11 (1984).

[64] *See* Claudia Copeland, *Water Quality Initiatives and Agriculture*, Cong. Research Serv., December 20, 2000, *available at* http://www.cnie.org/NLE (last visited Aug. 30, 2002).

[65] *Id.*

[66] *See* Boesch, *supra* note 8, 93-115.

that is usually stripped of all vegetation.[67] During a storm event, most of this waste simply "runs" off the field into a nearby stream or lake.[68] The materials contained in the waste, including nitrogen and fecal coliform, are then transported to watersheds and marine coastal regions.

The significance of farm animal wastes is immense. Statistically, animals raised for food produce 130 times as much excrement as the total human population.[69] Moreover, inadequate handling of this excrement has led to a number of disasters.[70] Industrial consolidation promises to increase the potential for disasters carrying negative environmental affects from future direct discharges.

Animal waste can also be discharged in the form of ammonia emissions.[71] Ammonia is created from animal waste when the manure changes, through a natural chemical reaction, from a solid to a gaseous form.[72] This gas then travels to aquatic areas where it is deposited via atmospheric deposition.[73] The deposits contain nitrogen, which then "feeds" the marine habitat with nutrients.[74]

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[67] ***Id.***
[68] ***Id.***
[69] **Interview with Bruce Fredrick, Advocate, PETA (Sept. 19, 2002).**
[70] **In 1995, a retention pond in North Carolina burst, and spilled out more than 25 million gallons of excrement into the Red River. The resulting "spill" killed an estimated 20-50 million fish and closed over 250,000 acres of commercial fishing grounds.**
[71] ***See*** **Boesch,** ***supra*** **note 1, at 29.**
[72] ***Id.***
[73] ***See generally*** **Paerl,** ***supra*** **note 32.**
[74] ***See*** **Boesch,** ***supra*** **note 1, at iii**

Recent evidence shows ammonia emissions from livestock operations can be a significant pathway for nitrogen inputs to coastal waters.[75] Collectively, this "pathway" can account for over half of the total nitrogen deposition in regions with extensive livestock production.[76] In the Chesapeake Bay watershed, for example, agricultural livestock contribute an estimated 81 percent of the annual atmospheric burden of ammonia.[77]

There is a correlation between increases in ammonia deposition and expanding animal production.[78] Examples include a 60 percent increase in ammonia-wet deposition on the Delmarva Peninsula during the past two decades coinciding with a twenty-fold increase in poultry production.[79] In addition, eastern North Carolina experienced a doubling of ammonia deposition during the same period swine production tripled in the region.[80]

2. Summary

Nutrient loading from agricultural operations is the most pervasive contribution to coastal eutrophication today. Although there are other contributors, federal and state

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[75] ***Id.***

[76] ***Id.*** **See also, Walker, J., et al.** ***Trends in Ammonium Concentration in Precipitation and Atmospheric Ammonia Emissions at a Coastal Plain Site in North Carolina*****, 34 Envtl. Science and Technology 390A, 390A-396A (2000).**

[77] ***See*** **Chimka, C.T.,** ***Ammonia and the Chesapeake Bay Airshed*****, Scientific and Technical Advisory Committee, Chesapeake Bay Program, Publication 97-1 (1997).**

[78] ***Id.***

[79] ***Id.***

[80] ***Id.***

regulations have succeeded in limiting their effect. Additionally, further regulation, along with technological advancements under a "best available technology" requirement, promise to lower nutrient output from these sources.

Agricultural operations have enjoyed little to no meaningful federal regulations.[81] The regulations that do exist have faced industry criticism, state reluctance, and a lack of congressional willpower. This is due to the manner in which agriculture has been regulated by the federal government. It has enjoyed unprecedented congressional deference through exemptions and nonsensical designations.[82] Is there any wonder why it now stands as a primary source of marine coastal pollution?

This paper will now look at federal regulations of agricultural operations and assess their effectiveness, or complete lack thereof, in controlling non-point source pollution. Problems in implementing certain programs, especially §303 under the CWA, will be identified. In addition, the need for a meaningful form of regulation that combines strong regulatory control over all sources of marine pollution while allowing for

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[81] The main regulatory mechanism for controlling agricultural operations, the CWA, has failed to regulate these harmful activities. The failure stems from two places. First, the CWA has exempted most agricultural operations from direct regulation. Second, the regulations that may apply to agricultural operations, water quality-based regulations, are ineffective due to implementation problems, and therefore do not create meaningful control of agricultural pollution. A main premise of this paper is federal regulations must begin to regulate agricultural operations, and the form of regulation imposed must be meaningful.

[82] Beyond the CWAs explicit exemption of agricultural operations in many cases, any regulatory authority to control most agricultural operations under the CWA falls within the definition of a nonpoint source. This has allowed agricultural operations to escape the NPDES permitting requirements for "point sources" under the CWA. Arguably, however, many of the sources of agricultural runoff meet the definition of "point sources" as defined under the CWA.

compromise will be discussed. The hope will be to expose the "universe" of difficulties associated with this complex area of regulation.

III. Federal Regulations of Nonpoint Sources of Pollution

1. Clean Water Act

Probably the most recognizable federal regulation dealing with water pollution is the Federal Water Pollution Control Act, or what is commonly referred today as the Clean Water Act (CWA).[83] Since its inception, the CWA has attempted, with varying success, to regulate nonpoint source pollution. A history of the CWAs evolution follows.

The original 1948 enactment of the Federal Water pollution Control Act (FWPCA) assisted in the prevention of water pollution by giving states technical grants and loans for building public wastewater treatment works.[84] Later, the 1965 Water Quality Act required individual states to set water quality standards for the establishment of discharge limits related to industrial and municipal effluent discharges.[85] However, reliance on states setting water quality standards was seen as an overall failure.[86] There are a number of reasons.

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[83] Water Pollution Control Act of 1948, ch. 758, 62 Stat. 1165 (1948) (current version at 33 U.S.C. §§ 1251-1387 (1994).
[84] *See id.* at §5.
[85] *See* Pub. L. No. 89-234, 79 Stat. 903 (1965) (current version at 33 U.S.C. §1313); *see also* Theodore L. Garrett, *Overview of the Clean Water Act, in* Clean Water Act Handbook 5 (Parthenia B. Evans ed., 1994).
[86] *See* WILLIAM GOLDFARB, WATER LAW, 168-170 (1988).

Prior to the enactment of the 1972 CWA amendments, the practice of states establishing acceptable concentrations of pollutants for different water bodies did not result in noticeable improvements in water quality.[87] States were finding it difficult to set specific water quality standards.[88] Further, for those states that were able to set specific standards, problems were arising related to determining when a discharge violated established standards.[89] In addition, states were having difficulty in allocating effluent limitations among several different polluters in a common watershed.[90] All of these problems led to the 1972 amendments to the FWPCA.

In 1972, the Clean Water Act (CWA) was enacted. It changed the format for pollutant discharge determination from a reliance on water quality standards to the introduction of technology-based effluent limitations.[91] The addition of discharge limitations to the prior, exclusive reliance on water quality standards reflected Congress's frustration with the failure of the FWPCA and the 1965 Water Quality Act to result in cleaner waterways.[92] Including changes to point source discharges, the 1972 amendments added a few specific programs aimed at dealing with nonpoint source pollution.[93]

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[87] ***See*** **J. GORDON ARBUCKLE ET AL., ENVIRONMENTAL LAW HANDBOOK 66 (11TH ED. 1991).**
[88] ***Id.***
[89] ***Id.***
[90] ***Id.***
[91] ***See*** **Goldfarb,** ***supra*** **note 86, at 170.**
[92] ***Id.***
[93] 33 U.S.C. §§ 1288, 1329.

Section 208 of the CWA required states to develop waste treatment plans to identify nonpoint source pollution.[94] States were also required to establish or designate an agency or organization to develop and implement the waste treatment plans.[95] The hope was these agencies, with plans in place, would develop procedures and methods to control nonpoint source pollution from intrastate sources.[96] The "driving force" behind section 208 was federal funding to assist the states in the designation process.[97]

Section 208 failed for a number of reasons, and was formally discontinued in 1981 when Congress pulled federal funding.[98] Specifically, the implementation of section 208 left unfettered discretion to the states[99], and Congress failed to adequately fund the program.[100] Thus, the CWAs first attempt at regulating nonpoint source pollution can be seen as a failure because it did not provide any meaningful reductions in the discharge of nonpoint source pollutants.

In 1987, Congress passed the Water Quality Act. It added a section 319 to the CWA.[101] This section required states to develop and implement programs to control nonpoint sources of pollution, *including runoff from farm* and urban areas, as well as

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[94] *See generally* Serena P. Wiltshire, *Nonpoint Source Pollution Control*, CWA Handbook, *supra* note 85, at 245.
[95] 33 U.S.C. § 1288(b)(1)(B).
[96] *Id.* at § 1288(b)(2)(F).
[97] *See id.* § 1288(f).
[98] *See* Robert W. Adler, *Addressing Barriers to Watershed Protection*, 25 ENVTL.L. 973, 1044 (1995).
[99] *See* Robert D. Fentress, Comment, *Nonpoint Source Pollution, Groundwater, and the 1987 Water Quality Act: Section 208 Revisited?*, 19 ENVTL.L. 807, 818 (1989).
[100] *Id.*, *supra* note 98.
[101] 33 U.S.C. §1329.

construction, forestry, and mining.[102] Section 319 is implemented in stages. These stages can be identified as assessment, plan development, and management.[103]

Section 319 has not been effective in implementing meaningful control strategies over nonpoint sources of pollution.[104] The program has lacked adequate funding by Congress, and enforcement is almost non-existent because EPA does not require states to penalize nonpoint source polluters failing to adopt best management practices.[105] Essentially, a state can receive funding simply by submitting a plan without taking active steps in management of pollution controls.[106] Recently, however, EPA has suggested revised regulations that would make Section 319 a stronger control mechanism.[107] This will be discussed in more detail below.

Section 401, although not generally regarded as a control mechanism on nonpoint source pollution, may become more prevalent in the future. Section 401 is a permitting statute that requires any applicant for a federally permitted or licensed activity that might result in a discharge into navigable waters to obtain a section 401 certificate from the state in which the discharge is likely to occur.[108] To be subject to 401 certificate

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[102] ***Id.***
[103] ***See*** **Copeland,** ***supra*** **note 4, at CRS-5.**
[104] ***Id.*** **at CRS-6.**
[105] ***Id.***
[106] ***See*** **David Zaring, Note,** ***Agriculture, Nonpoint Source Pollution, and Regulatory Control: The Clean Water Act's Bleak Present and Future*****, 20 HARV. ENVTL.L.REV. 515, 527 (1996).**
[107] ***Id. supra,*** **note 103.**
[108] 33. U.S.C. § 1341(a)(1).

requirements, there must exist an application for a federally permitted activity, and the proposed activity must be likely to result in a discharge into navigable waters.[109]

Although these two requirements are subject to some interpretation, court case analysis has adopted a broad sphere to include almost any activity that may result in any discharge.[110] In addition, although section 401 language states it regulates point source discharges, some court decisions have suggested nonpoint sources of pollution may also be covered by section 401.[111] The implications of section 401 is that states may have an additional regulatory mechanism for controlling nonpoint source pollution that covers a wide range of potential polluters.

Section 303 requires states to establish ambient water quality standards for subsurface waterbodies.[112] To properly establish ambient water quality standards, states must consider all sources of pollution, including point and nonpoint sources, in their analysis.[113] Section 303(d) requires states to identify and establish total maximum daily loads (TMDL's) for waters where water quality standards have not been realized, after implementation of technology-based controls, under section 303.[114] Even though section

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[109] ***Id.***
[110] ***See generally*** **Deborah L. Donahue,** ***The Untapped Power of the Clean Water Act Section 401*****, 23 ECOLOGY L.Q. 201 (1996).**
[111] ***Id.*** **at 230.**
[112] 33. U.S.C. § 1313.
[113] ***See generally*** **Claudia Copeland,** ***Clean Water and Total Maximum Daily Loads (TMDLs) of Pollutants*****, October 30, 2001,** ***at http:// www.cnie.org /nle/crsreports/water*** **(last visited July 20, 2002).**
[114] 33 U.S.C. § 1313(d).

303 was passed in 1972, implementation by the states had been nearly non-existent.[115] Reasons for lack of implementation will be discussed in further detail below.

2. Coastal Zone Management Act

A reauthorization of the Coastal Zone Management Act (CZMA) in 1990 led to §6217, which attempts to specifically address nonpoint sources of pollution.[116] This section requires the greatest degree of pollution reduction achievable through the application of Best Available Nonpoint Pollution Control Practices (BANPCP).[117]

It is important to note this form of regulation is technology-based, and should be contrasted with §303, which is water quality-based. Some commentators have noted Congresses passage of §6217 was in response to the growing concern that nonpoint sources of pollution were beginning to dominate water quality issues.[118] By adopting a technology-based control mechanism, Congress may be conceding the ineffectiveness of §303s ambient-based regime. However, a total lack of enforcement measures, including the absence of a citizen-suit provision, has made implementation and enforcement of §6217 wholly ineffective at regulating nonpoint source pollution.[119]

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[115] *See* Copeland, *supra* note 113, at CRS-2.
[116] 16 U.S.C.A §1455(b).
[117] OLIVER A. HOUCK, THE CLEAN WATER ACT AND TMDL PROGRAM: LAW, POLICY, AND IMPLEMENTATION, ELI, 426 (1999).
[118] *Id.*
[119] *Id.* at 99.

3. Farm Bill ("Swampbuster" Provision)

"Swampbuster" is a farm bill provision, enacted in 1985, that uses disincentives rather than regulations to protect wetlands on agricultural lands.[120] The "Swampbuster" provision states that farmers or ranchers lose eligibility for farm program benefits if they produce an agricultural commodity on a wetland converted after December 23, 1985, or if they convert a wetland after November 28, 1990, and make agricultural production possible on the land.[121]

This program is limited, as it only applies to farmers who are eligible to receive farm program benefits.[122] Further, it creates a choice for the farmers, who are not compelled to comply.

4. Summary

There are a number of regulations that attempt to deal with nonpoint source pollution. The Clean Water Act has attempted to control nonpoint sources through the development of ambient-based water quality measures. The Coastal Zone Management Act attempts to regulate coastal nonpoint sources through a technology-based standard. Meanwhile, other provisions, such as "Swampbuster" under the Farm Bill, regulates through disincentives in order to maintain wetland areas. However, as will be shown,

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[120] *See* Jeffrey A. Zinn and Claudia Copeland, *Wetland Issues*, May 15, 2002 at CRS-9, *at http:// www.cnie.org /nle/crsreports/wetlands* (last visited September 9, 2002).
[121] *Id., supra* note 6.
[122] *See* Zinn, *supra* note 120.

these regulations are ineffective at regulating nonpoint sources of pollution. The lack of effective regulation stems from unrealistic measures of control, unenforceable provisions, and a limited scope in defining a regulated class. We will now look at each of these attempts at regulation, and show why they are ineffective at controlling nonpoint sources of pollution.

IV. Ineffective Regulation of Agricultural Sources of Pollution

1. CZMA, §6217s Failure

Implementation of §6217 has met with disappointing results. Although §6217 required implementation of BANPCP, a technology-based standard, it lacked strong regulation and enforcement mechanisms.[123] Indeed, under §6217, federal agencies were inept at enforcing the requirements for the listing of impaired waters.[124] States were being influenced by local political forces, and therefore were lax in developing and implementing plans.[125] This was occurring even when Congress mandated the state coastal plans contain "enforceable policies and mechanisms" to implement the nonpoint management regime, and required state programs to be submitted and approved within three years, or by May 1995.[126]

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[123] *See* Houck, *supra* note 117, at 99-105.
[124] *Id.*
[125] *Id.*
[126] *Id.* at 101, citing 16 U.S.C. §1455(d)(16), §1455(b)(a)(1).

As of 1998, not one state had complied in submitting an approved program.[127] The influence of private interests outweighed the states obligation to adhere to the requirements under §6217. The main reason for this is undoubtedly the lack of strong enforcement mechanisms, including citizen suits, available under §6217. With weak enforcement mechanisms, the state, as decisionmakers, is left to weigh the relative costs and benefits of compliance at the expense of industry criticism. However, federal agencies also suffered due to a lack of enforcement mechanisms.

Federal agencies were subject to their own political influences, and the result was little to no enforcement of the statutory requirements on states.[128] Most importantly, there was no citizen suit provision. Thus, there is no public force able to mandate government compliance with CZARA. Rather, federal agencies, due to influences from agriculture, silviculture and states, are working to relax current standards.[129] Certainly, if federal agencies were subjected to specific mandates and held to specific implementation measures, the success of §6217 would likely be different because political influences would be marginalized.

Section 6217 will do little to prevent nonpoint sources pollution. This is mainly due to weak enforcement provisions. Indeed, by its very structure, the only federal enforcement mechanism is the withholding of a portion of Federal Coast Environmental Assistance Funding.[130] This amounts to a relatively small "carrot" in terms of incentives. Further, states are forced to decide between the loss of money from federal funding

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[127] ***Id.***
[128] ***Id.***
[129] ***Id.*** **at 103.**
[130] ***See*** **Zaring,** ***supra*** **note 63 at 530.**

through non-compliance, and the loss of money from private interests, who are also nonpoint source polluters, for complying with the statute.[131] In most instances, this amounts to a "no-brainer" for the states.

Assuming strict enforcement measures, a citizen suit provision is a necessary element of any strong regulatory enforcement scheme. The addition of a citizen suit provision to §6217 would have aided in its success by helping to further marginalize the effect of private influences. Indeed, the relative success of citizen suit enforcement has been shown in other areas of nonpoint regulation.[132] Thus, one major contribution to §6217's lack of success is its failure to provide for citizen enforcement.

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[131] *See* Houck, *supra* note 117, at 132-133 (stating that in actual practice, the scope and rigor of state water quality standards were heavily influenced by local dischargers, creating inequalities within states and sending some states (primarily in the South) into a classic race to the bottom where industry moves to the states with the least restrictive pollution standard. This is because state standards will be so different from one to the next under water quality-based criteria. The result is a process where states have little incentive to create water quality-based standards and an implementation plan unfavorable to local industry).

[132] *Id.* at 75. Describing the effect of citizen suits on "resurrecting" the requirements under §303(d) of the Clean Water Act:

> **"Against a backdrop of federal environmental programs in which litigation has played a central role, it is hard to think of any program more precipitously driven by citizen suits from absolute zero toward its statutory destiny than TMDLs." *Id.***

Describing the lack of compulsion felt by EPA to enforce §303(d) prior to citizen suits:

> **"Short of some outside impetus, whatever Congress prescribed in 303(d) was going to be ignored for no more complex reasons than (1) compliance was hard and (2) ignoring seemed possible." *Id.***

Section 6217 had great intentions. It promised a strong technology-based standard to apply to nonpoint discharges. However, because of the lack of strict federal enforcement mechanisms, most importantly a citizen suit provision, the statute has failed. The lesson learned here is technology-based regulations are only the beginning. Without strong regulations, and strong enforcement measures, even the best statute can become a "paper tiger."

2. Farm Bill (Swampbuster's Failure)

"Swampbuster" has a limited scope, both in terms of a regulated class and regulated area. First, the provision only applies to farmers who are eligible, and receive, federal subsidies. Many farming operations are simply not eligible for federal assistance. Moreover, some farming operations that are eligible simply choose not to receive subsidies. Finally, farmers who are eligible and receive subsidies may find it financially lucrative to forego the subsidy in lieu of farming all areas of their land, including wetlands.

Second, "Swampbuster" only covers farming activities that affect wetland areas. Thus, the provision is limited to one particular area affecting water resources. As such, it cannot be seen as an encompassing measure for total water protection. Of course, this does not mean "Swampbuster" should be relegated to the "scrapheap" of ineffective environmental regulations. However, it does not represent an encompassing measure that

can be readily implemented to cover all nonpoint influences on water quality because it is limited in scope.

Undoubtedly, "Swampbuster" aids in securing some wetland preservation. However, this is not a solution to achieving complete water quality. A "wholly-encompassing" regulation must be enacted that regulates all nonpoint dischargers equally. "Swampbuster" is certainly a "piece of this pie," but it is not a solution. Further, one must ask how effective a regulatory mechanism is that regulates so few of a particular class of dischargers, and operates on a voluntary basis.

The voluntary nature of "Swampbuster" makes it a weak regulatory mechanism. Although it is termed a disincentive, "Swampbuster" does not prohibit conduct on farming land. Instead, it offers farmers a choice; reject federal subsidies or protect wetland areas. Moreover, the "value" associated with the wetland is directly dependant on the amount of subsidy the farmer would receive in lieu of damaging the wetland. It is left to Congress to ensure the subsidy is sufficient, in each instance, to provide for wetland protection. This removes any incentive for the farmer to protect wetlands for any other reason than monetary compensation. However, a mandatory control mechanism would require compliance by the farmer regardless of compensation. This would ensure a minimum level of regulation, uniformly applied, for the protection of water resources.

The "disincentive" structure of "Swampbuster" may reflect an attitude regarding federal regulation of private lands, especially agricultural operations. Indeed, some suggest our history of environmental regulation has showed a great restraint towards

federal regulation of private land use.[133] "Swampbuster" can be seen as an attempt to balance these competing interests. This will be discussed in more detail below.

3. Section 303s Failure

As noted above, §303 attempts to regulate nonpoint sources of pollution through a mix of federal subsidies and reporting requirements. However, political influences, problems with assessment, state reluctance, and most importantly, no strict regulation or enforcement, have all combined to make §303 an ineffective means of regulating nonpoint sources.[134]

Recent citizen lawsuits under §303 have caused resurgence in its development.[135] The result has been an increase in the development of TMDLs,[136] an excellent example of the benefits of a citizen suit provision in enforcing obligations required under statute. However, the TMDL lists being developed are inadequate, and will result in little, if any, improvement in water quality.[137] The reason is nonpoint regulation under the CWA remains fixated on a water quality-based regime that is impossible to assess and implement.

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[133] *See* William F. Pedersen, Jr., Federal Environmental Regulation and Control of Private Land Use, 4 (Sept. 2002) (unpublished manuscript, on file with Author).
[134] *See* Zaring, *supra* note 63 at 520-522.
[135] *Id. supra* note 117.
[136] *Id.*
[137] *Id.* at 76 (discussion of how current state TMDLs being created for EPA focus on waste load allocations from *point sources* and do not take into consideration contributions from *nonpoint sources*. Thus, the result is a water quality analysis that does not account for diffuse contributions).

a. Section 303's Problems with Assessment: The Limits of Science

As a water quality-based form of regulation, §303 functions on the premise that science can identify the following; how clean the water needs to be for a particular activity, how much pollution is going into the water, how much pollution is being added by each individual polluter, the effect of each polluters pollution on the quality of the water, and how to create water quality through individual regulation. As should be somewhat obvious, this is asking a lot from science.

The reality is science cannot create accurate assessments of water quality based on individual causes and effects. At best, science can offer some degree of analysis on the "relative" impacts of certain pollution activities. It cannot precisely list exact levels of influence from each polluter. Science can only draw inferences as to affects on current water quality.[138] This lack of precision plays right into the hands of the regulated. It is

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[138] An excellent example of the difficulties fraught with determining water quality can be discerned from the following excerpt:

> **"Water quality criteria are primarily based on laboratory exposure and effects data. In collecing exposure and effects data, standard test designs require high consistency of exposure over time and effects are monitored over timescales of days to months. The intent is to achieve reproducible and precise data, even though these controlled conditions may not accurately reflect field scenarios. From the laboratory data developed for an array of species, a statistical estimate is made of the concentration of a material that will be protective of the "most sensitive species." Account is taken of the interaction between a limited number of environmental variables (hardness, acidity, or salinity) and the chemical of concern by modeling the relationships, again assuming time constancy in all these**

the private interests who champion the idea of water quality-based initiatives who also condemn the "lack of scientific certainty" in TMDL listings compiled by states.[139] However, because of the nature of water quality-based initiatives, a "lack of scientific certainty" is par for the course. Thus, once states compile a TMDL listing, the regulated are ready to challenge the listings on grounds of inadequate causation.[140] This severely limits the use of TMDL lists in the development of a regulatory mechanism.

Science is limited under a water quality-based regulatory format. This is due in large part to the complicated dynamics involved in water quality assessment. You have to know what you are looking for, and understand each individual dischargers impact on the water body. This has proven difficult, if not impossible. However, there are other influences limiting the effectiveness of §303. One such influence stems from private influences on the development of substantive regulations.

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parameters. A safety factor is then applied to account for environmental variability and uncertainty."

***See* Newman, Michael C., et al., *Coastal and Estuarine Risk Assessment*, College of William and Mary, Virginia Institute of Marine Science, Gloucester Point, Virginia, 3 (2002).**

[139] *See* Houck, *supra* note 117, at 77 (discussion of how industry, under the auspices of "sound science," will likely be implementing legal challenges to the state listing of impaired waters and identification of particular sources based on anything short of dispositive evidence).

[140] *See generally* Oliver A. Houck, *The Clean Water Act TMDL Program V: Aftershock and Prelude*, 32 Envtl. L. Rep. 10385 (April 2002).

b. Political Influences

Section 303 has suffered from a lack of political will to implement meaningful regulation of nonpoint polluters. This can be seen as far back as 1972 when Congress altered the regulatory mechanism of point sources from a water quality-based regime to a technology-based regime. Congress made a conscious choice to place water quality as a priority above special interests. This was undoubtedly due to an overwhelming public demand for clean water. However, Congress was focused on point sources, since they were the primary concern of the time.

Somehow, although conceding the effectiveness of water quality-based regimes, Congress maintained this regulatory format for nonpoint sources of pollution. Further, Congress highlighted the political influence of agriculture in 1972, when it included it as *both* a point source and nonpoint source of pollution![141] This subjected only the largest agricultural operations to technology requirements, while exempting most other agricultural operations from any meaningful form of regulation.

Presently, technological-based regulations have achieved substantial reductions in point source pollution. It is now time for Congress to concern itself with nonpoint

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[141] *See* Kershen, *supra* note 52 at 3. (indicating the inclusion of agriculture in both point and nonpoint source definitions):

> **"As worded in 1972, section 208(b)(2)(F) expressly referred to 'agriculturally and silviculturally related nonpoint sources of pollution, including runoff from manure disposal areas, and from land used for livestock and crop production ...' as a nonpoint source. By contrast, as worded in 1972, section 502(14), 33 U.S.C. § 1362(14), specifically defined point source to include '... any pipe, ditch, channel, tunnel [and] concentrated animal feeding operation ...'" *Id.***

sources, specifically agricultural contributions, which make up the majority of current pollution in our waters. Whether Congress has the political willpower to make nonpoint regulation a priority remains to be seen. A review of the record to date looks disappointing.

Recently, EPA has made a concerted effort to set effective regulations related to sections 319 and 303.[142] In 1997, EPA issued a policy which for the first time called on states to develop long-term schedules for implementing TMDLs.[143] EPA directed states to establish TMDLs in order to meet water quality standards within eight to thirteen years.[144] As a result of this impetus, development of TMDLs is being initiated at an increasing pace. However, most TMDLs remain to be completed.[145]

In August of 1999, likely due to increased pressure brought on by private lawsuits, EPA proposed further revisions to the TMDL regulations to clarify and strengthen the program.[146] Included were: a new requirement for a more comprehensive list of impaired and threatened waterbodies; a new requirement that states, territories and authorized Indian tribes establish and submit schedules for establishing TMDLs; a new requirement that the listing methodologies be more specific, subject to public review, and submitted to EPA; a clarification that TMDLs include ten specific elements; a new

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[142] ***See*** **Copeland, *supra* note 113, at CRS-3.**
[143] ***Id.***
[144] ***Id.***
[145] ***Id.***
[146] ***Id.***

requirement for an implementation plan in TMDLs; and new public participation requirements.[147]

The 1999 proposed changes drew praise from environmental groups and jeers from the private sector and states.[148] The private sector, especially agriculture and forestry, criticized the proposed regulations because they would be included as regulated parties for the first time in CWA history.[149] In addition, the new regulations specifically included nonpoint sources, which had not been regulated under the CWA in the past.[150] States opposed the program because of additional burdens the new requirements would place on them.[151] The criticisms drew congressional attention, and hearings on the proposed regulations resulted.[152] Due to the pressure exerted on the agency, EPA decided to modify the 1999 proposed regulations.[153] Specifically, EPA dropped several provisions potentially affecting agriculture and forestry. In the final draft of the revised rule, EPA clarified its understanding that it lacks regulatory authority over nonpoint sources of pollution, and can only influence their activities through use of grants and funding.[154]

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[147] ***Id.***
[148] ***Id.***
[149] ***Id.*** **at CRS-4.**
[150] ***See generally*** **Claudia Copeland,** ***Water Quality: Implementing the Clean Water Act*****, January 9, 2002,** ***at http:// www.cnie.org /nle/crsreports/water*** **(last visited Aug. 29, 2002).**
[151] ***Id.***
[152] ***Id.***
[153] ***Id.***
[154] ***See*** **Copeland,** ***supra*** **note 113, at CRS-4.**

The executive has also become involved in preventing enactment of EPAs proposed regulations. Recently, the Bush Administration has delayed the implementation of the new TMDL regulations until April 2003, to further review the "appropriateness" of the regulations.[155]

As should be obvious from the previous historical account, political and private interests have been unwilling to extend any form of regulation on nonpoint sources of pollution. EPA received a clear message; the process is broke, but don't try to fix it! States were fearful that increased requirements would place them in a financial bind. Private industry called on their political favors to quash any attempt at strengthening and "federalizing" nonpoint pollution controls. Obviously, unlike 1972, Congress was not ready to place environmental quality above "debts" owed to special interests. It will likely take strong public sentiment calling for change before Congress heads the call to improved water quality. When that time comes, will Congress be prepared to enact meaningful regulations that are strong with strict enforcement?

c. Lack of Regulation and Enforcement

Probably the greatest problem to effective implementation of §303 has been its lack of legislative regulation and enforcement. Section 303 gives states the primary responsibility for developing regulations related to controlling nonpoint source

[155] ***See*** **Copeland,** ***supra*** **note 115, at CRS-1.**

pollutants.[156] In addition, states have sole authority for enforcement of the regulations they develop.[157] This, in essence, removes federal regulatory authority. Indeed, federal agencies are left with a "carrot-and-stick" form of regulation by conditioning grant monies available under §319 on states implementing their completed TMDL plans.

States, in turn, have little incentive for implementing TMDL regulations. Indeed, many states have noted implementation is a costly prospect, and may have collateral consequences for their relationships with private industry.[158] Thus, the current nonpoint regulatory scheme actually creates disincentives for states to develop, implement, and enforce meaningful regulations.

4. Summary

Current federal regulations of agricultural operations have failed because of numerous reasons. Recent regulations including §6217 and "Swampbuster" have been ineffective because they are respectively void of strict enforcements and limited in scope. The CWA has failed because of political compromises that exempt most agricultural operations from meaningful regulation. This has resulted in EPA and states attempting to implement an impossible regulatory format in §303(d).

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[156] ***See*** **Houck,** ***supra*** **note 117**
[157] ***Id.***
[158] ***Id.*** **at 132-133 (suggestion that collateral consequences of state-specific water quality regulations include "forum shopping" by industries for the states with the lowest standards).**

There is a silver tint in the clouds of regulatory doubt. The recent citizen suits enforcing §303(d) TMDL requirements has reinvigorated interest in nonpoint pollution sources. In addition, the technology forcing mechanisms created in §6217 point toward a congressional concession that ambient-based regulations simply do not work. Finally, the increased controls, although limited, in the "Swampbuster" provision suggest regulation of agricultural operations is becoming somewhat politically acceptable. The time is becoming ripe for a change.

A discussion of a proposed regulatory format for change follows. It is based on a general control mechanism using technology-based standards rather than the current ambient-based standards under §303. It also contains a provision for alternative measures of enforcement. The alternatives measure is based on an assumption that technology-based regulations are a good start, but they must ultimately give way to a more individualized regulatory mechanism as more is learned through science about maintaining water quality.

The Section begins with an analysis of §303 as a strong regulatory framework for adoption of a "technology with alternatives" approach. A description of the "technology with alternatives" approach follows.

V. Alternative Approach: "Technology with Alternatives"

Section 303 is the best vehicle for meaningful regulation of nonpoint sources of pollution. There are three reasons for this. First, §303 has "been on the books" for a long

period of time, and it thus has a long history of statutory existence, if not implementation. Second, §303, being under the CWA, includes the regulatory mechanism of citizen enforcement. Without citizen enforcement, it is likely any changes made to §303 would be subject to the same influences of CZMA's §6217, which has made it a "paper tiger." Third, and most importantly, the failure of §303s current form makes it "ripe" for a change.

This article suggests that change take the form of a technology-based regulation with the opportunity for alternatives, and strict enforcement regulations. This would drastically change current CWA implementation, which differentiates regulatory controls between point and nonpoint sources.[159]

Nonpoint sources, which are generally regulated through adoption of §303 water quality-based regulations, would now be subject to technology-based regulations. This would require changing the regulatory mechanism for nonpoint sources from water quality standards to technology standards. Agricultural operations would be included as a nonpoint source of pollution.

An alternate recommendation would be to statutorily characterize agriculture as a point source under current CWA regulations, and make them subject to the NPDES permit system. Then, the current technology regulations could be modified to "offset" the additional burdens placed on agriculture as a result of this change.

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[159] *See* Melissa Thorme, *Clean Water Act Section 305(B): A Potential Vehicle for Incorporating Economics Into the "TMDL" and Water Quality Standards-Setting Process,* 13 TUL.ENVTL.L.J. 71, 72 (1999).

Regardless of how the alternative mechanism is implemented, §303 provides the necessary statutory framework. The reasons why follow.

1. The Importance of §303s History

Section 303 has existed in its current form since 1972. As such, it has enjoyed a number of reauthorizations that enforce the notion of congressional assent to the problem of nonpoint source pollution, and the need for some form of regulation. However, §303 has only recently come to the forefront of clean water regulation. Starting in the late 1980's, numerous citizen lawsuits spurred §303s development from "existence" to "implementation."

Since 1972, §303 has required states to do assessments of waterbodies, and determine their particular TMDLs. States have been unwilling to do this for varying reasons. Many states claimed they lacked the resources to do TMDL analyses because they involve complex assessments of point and nonpoint sources to ascribe and quantify environmental effects for particular discharge sources.[160] Other states have noted they lack the baseline water quality monitoring data for the analyses.[161] Although EPA had authority to intervene under the act, and do the analyses themselves, EPA was reluctant and did nothing.[162] This was only until the private citizen groups began suing both states and EPA. The lawsuits have forced a number of states to engage in the establishment of

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[160] ***See*** **Copeland, *supra* note 155, at CRS-2.**
[161] ***Id.***
[162] ***Id.***

TMDLs.[163] Presently, there are some forty-two states that are in litigation, are under court order, or have stipulated to the development of TMDLs with specific deadlines.[164]

A large part of the success of these lawsuits undoubtedly had to do with the vast amount of time between enactment of the statute and implementation. Further, because of the lawsuits, substantial data has been collected.[165] This data will be instrumental in helping to develop alternatives for technology-based requirements. It is unlikely this data would be available if not for the lawsuits. Moreover, it is unlikely the lawsuits would have gone forward if §303 had not existed "on the books" since 1972.

2. The Importance of Citizen Enforcement

As can be deduced from above, §303 would likely have gone the path of §6217 had it not been for the citizen suit provision under the CWA. As the history shows, §303 was comfortably placed on the shelf of "dead" statutes until private environmental groups resurrected it.

Citizen suit provisions are essential to the enforcement of any environmental regulation. This is especially true in the context of nonpoint source regulation under the CWA. Private interests have a particularly strong voice in federal and state governments, and this creates a disincentive for regulators to enact legislation, much less enforce existing legislation. However, citizen groups are able to set aside these "influences" and

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[163] ***Id.***

[164] ***See*** **TMDL Litigation By State, *at* http://www.epa/gov/owow/tmdl/ lawsuit1.html (last viewed July 22, 2002).**

[165] ***Id.***

focus on the task at hand, protection of our waterbodies. And it works. In the context of §303(d), citizen suits have revised nonpoint regulation, at least to some extent, and states are now being required to develop water quality listings.[166] The next step in fixing nonpoint regulation is to create a standard of regulation that is achievable, and places burdens equally on all nonpoint polluters throughout the country.

3. A "New" Enforcement Mechanism

Section 303 must embrace a technology-based enforcement standard as its primary regulatory mechanism in order to obtain effective and meaningful nonpoint pollution regulation. A technology-based standard would "fix" many of the problems associated with the current §303 regime. It would place uniform standards on all nonpoint dischargers. This would prevent the states from "racing to the bottom" in an attempt to appease private interests. In addition, these uniform standards would be based on the best available technology standards, which would ensure the best possible environmental protection. However, this would not be the end.

As seen in CZMA's §6217, even a technology-based regulation has little effect without proper enforcement. Certainly, a technology-based §303 would be subject to the citizen suit provisions of the CWA. This would help to ensure federal and state compliance with the statute. However, there must also be strong federal enforcement mechanisms, like those presently in place under the CWAs point source regulations.

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[166] *See* Houck, *supra* note 117, at 75.

Strict federal regulations ensure state compliance, and a citizen suit provision helps to inhibit the influence of private interests.

Finally, and most importantly, there must be the availability of alternatives. Alternatives have been a dominant tool of successful environmental law since its inception.[167] Alternatives allow the opportunity for innovation. Innovation breeds advancements, and advancements further the goal of environmental protection. In the context of §303, an alternative approach might be based on a water quality assessment, and allow for local participation. However, it must be used to supplement a technology-based approach, and should only be implemented when it has been shown the alternative allows for a minimum of the same degree of protection. The burden of developing this alternative must be placed on the producer of the pollution, as well as the burden of showing the alternative creates, at a minimum, an equivalent amount of environmental protection. Let's take a look at how this might work.

a. Technology with Alternatives Implementation

In the area of nonpoint source regulation, we must first employ a technology-based control through BAT standards. For many places, such as animal feeding operations, this may include a filter strip, buffer zone, and retention pond. Section 319 monies could be used to help implement these controls, and the federal government would create a permit issuing system like that in place under point source controls. Once

[167] *See* Oliver A. Houck, *Of BAT's, Birds and B-A-T: The Convergent Evolution of Environmental Law*, 63 MISS.L.J. 403, 407 (1994).

technologies were in place, it would be the discharger's responsibility to maintain compliance. If a violation occurs, stiff penalties, equivalent to those found under the point source regime, would be imposed. Policing would occur through a cooperation of federal and state regulators and concerned citizens who could enforce the acts measures through a citizen suit. An example of an innovate policing program will be discussed below under the Idaho Dairy Initiative.

This may be the end of the story for this particular discharger, especially since many BATs for agricultural polluters are low-cost, and capable of federal subsidies.[168] However, let's assume the cost of implementation, or maintenance, of BATs is substantial. Further, let's assume government subsidies are lacking or non-existent. The discharger is then forced to implement controls that are costly and time consuming. The discharger will likely be angered at the prospect of spending capital, and may attempt political influence, or non-compliance. However, under this system, there are too many strict regulations and, more importantly, enforcement mechanisms in place to allow the discharger to "skirt" the system.

Faced with a prospect of significant expenses, the discharger, under basic theories of market forces, will try to find a cheaper way of accomplishing the same goal; environmental health through water quality. If the law allows for an alternatives-based approach after implementation of BAT, there is an incentive for the discharger to "find a better way." By allowing this, you are accomplishing what could not be accomplished under the old water quality-based approach. You are allowing each discharger to

[168] *See* Houck, *supra* note 117 at 166.

determine their particular influence on a water system, and then fix it. In essence, you are looking at each individual's impact on the quality of a watershed on a case-by-case basis. A technology-based standard at the start simply ensures a strong level of nonpoint pollution protection, while offering incentives to dischargers to find a "cheaper" way of controlling their pollution through alternatives. Further, by analyzing alternatives, the dischargers are looking to their individual impact on the watershed, and offering solutions based on their impact. Thus, a water quality-based objective is also met.

The "technology with alternatives" approach suggested here is in ideological contrast to the current ambient-based regime enforced under §303. Section 303, in its current form, is a water quality-based approach that is voluntary, and attempts to solve nonpoint pollution by focusing on individual dischargers and discerning their individual and cumulative affects on a scientifically suspect notion of water quality.

The "technology with alternatives" approach, to the contrary, is a technology forcing mechanism that is mandatory, and focuses on regulating the pollutant, rather than attempting to ascertain the polluter's individual and cumulative affect. In addition, this standard offers an alternative to the technology approach after technology regulation has been implemented. The alternative may take the form of a water quality-based approach, or it may offer other alternatives such as the purchase of pristine land in exchange for relaxed technology-based regulation. In any case, the alternative is not mandatory. It is a supplemental, voluntary approach, at the election of the discharger. The discharger would be required to show the measure offers, at a minimum, the same amount of environmental protection as the technology standard currently in place.

Thus, under a "technology with alternatives" approach, you are requiring mandatory levels of protection focusing on the pollutant, rather than individual dischargers. However, you are also allowing for a voluntary mechanism, at the election of the discharger, which gives the discharger a say in how to implement water quality protection.

There are problems with this suggested approach. Technology tends to over-regulate, and not fully consider individual affects on water quality. Further, there are serious questions regarding whether alternatives can be implemented. We now turn to the problems associated with the proposed "technology with alternatives" approach to determine if it truly offers a better form of regulation for agricultural operations.

b. Problems with "Technology with Alternatives" Approach

1) Problems with a Technology Approach

As should be obvious, a "technology with alternatives" approach embraces technological control mechanisms. However, these mechanisms can result in "over-regulation" in many instances. This "over-regulation" creates regulation for regulations sake, where a particular industrial discharger is being regulated regardless of the level of pollutant discharge.[169] The result is an "economic waste" where private industry resources are being spent on implementing technologies to control pollution discharges

[169] *See generally* William F. Pedersen, Jr., *Turning the Tide on Water Quality*, 15 ECOLOGY.L.Q. 69, 82-83 (1988).

that simply do not exist.[170] Further, these economic wastes lead to "demoralization costs" for industry.[171]

The "costs" associated with a technology-based approach should be considered seriously, and weighed against the benefits of uniform pollutant regulation. As will be shown below, other alternatives, including water quality-based regulations, are inadequate because they suggest an impractical regulatory regime; a situation where each polluter is analyzed individually, and there individual impact is then regulated against the quality of the water. Although this would create an ideal - matching the level of regulation to the effect of each polluter - it is not currently attainable. The lessons learned from the TMDL requirements under §303(d) stand as testament. Even if it were possible, the gap in time between assessment and regulation would be substantial. This would result in water quality degradation, clearly not the goal of water quality regulations.

Technology standards, although imperfect, are the best mechanism for controlling nonpoint pollution sources. However, we must be mindful of its weaknesses. This is why an "alternate" approach must be applied where the regulated community can prove implementation of some other control would achieve water quality. The question then

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[170] *Id.* at 84.

[171] *See* William F. Pedersen, Jr., Federal Environmental Regulation and Control of Private Land Use, 4 (Sept. 2002) (unpublished manuscript, on file with Author). On defining demoralization costs:

> **"demoralization costs are determined by (A) the extent of the restriction imposed on the freedom of action of the regulated and (B) the degree to which the regulated do not consent to that restriction."** ***Id.***

becomes, can this alternate approach really work? Indeed, if it is impractical to develop water quality standards as a main regulatory measure, then how can we expect implementation after-the-fact? Moreover, how can we ensure regulators are making "good deals" when allowing for alternative regulations?

2) Problems with Alternative Approach

It must be assumed the notion of "alternatives" under a "technology with alternatives" approach would include a water quality-based analysis of the individual polluters impact on the water body, and the measures needed to control that pollution. As such, the *analysis* required would include assessment of the following; the quality of water desired, the dischargers affect on the water quality, and a control mechanism that would minimize the discharger's affect such that water quality is maintained. Once this is established, the discharger would presumably conduct a cost-benefit analysis to determine whether the current technology control or "alternate" control would be a more cost-effective mechanism for maintaining water quality.[172]

One assumption under the "technology with alternatives" approach is the discharger can identify their individual impact on the water body. Indeed, it is unknown whether this would be possible in all situations, or at the current time. However, as

[172] **One would assume the discharger would have conducted preliminary assessments before engaging in data collection, etc., to determine the relative savings from implementation of alternate control mechanisms. Thus, the use of alternate controls would likely be undertaken only in situations where there is a substantial cost savings in the long-term by implementing the "alternative" over the technological control.**

regulation of nonpoint sources increase, the wealth of knowledge through increased data collection and analysis will likely improve. Certainly, if there is a great disparity of costs between technological and alternate regulations, dischargers will have a financial incentive for aiding in the development of water quality criteria. Otherwise, they will implement the technology requirements. Either way, the protection of water quality is achieved. Whether it is achieved through focusing on the pollutant or water quality is irrelevant. Under a "technology with alternatives" approach, the decision on the form of control is left to the discharger. This will aid in minimizing "demoralization costs" regularly associated with technology-based regulations.

Assume the discharger is able to identify an "alternative" approach that is more cost effective than the current technological requirement. The question then becomes what will constitute sufficient proof regarding the alternative approach's ability to maintain an equal or better level of protection than the technological requirement? Here, the standard must be "no discernable contribution to water quality degradation."

Technology-based requirements focus on regulating the pollutant. This form of regulation is not concerned with water quality. As such, it does not discern the individual affects of particular dischargers. Thus, when a discharger comes forward with an alternative approach for regulation, they are asking the regulator to analyze their particular influence on the water body, and agree the alternate form of regulation maintains sufficient pollutant protection as is being achieved under the technology-based requirement. It is then up to the regulator to compare relative "apples with oranges" and decide if the alternate mechanism can be implemented. Although this will likely prove

difficult, if we focus on the goal, water quality, and we find a sufficient showing by the regulated that their actions, under the alternative regulation, will not contribute to water quality degradation, then the alternate should be allowed.

A sufficient showing of no contribution to water quality degradation must adopt an objective standard of proof. Only objective scientific data will support such a proposition. This would likely take the form of data collection and assessment, as well as statistical modeling where the circumstances warrant. However, without the objective data, the proposal should be denied due to a lack of credible evidence supporting the alternative measure.

The interpretation of the objective data is one of the most difficult issues surrounding the validity of an alternatives approach. While the alternatives measure attempts to replace technology controls, and is required to be based on objective evidence, a lack of scientific ability to determine "relative impact" will make determinations difficult. The result will be situations where the objective evidence cannot be resolved universally to validate or dismiss a proposed alternative. This uncertainty may be minimized through the use of risk assessments,[173] which may help to limit uncertainty.

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[173] *See* Newman, Michael C., et al., *Coastal and Estuarine Risk Assessment*, College of William and Mary, Virginia Institute of Marine Science, Gloucester Point, Virginia, 3 (2002). In discussing the usefulness of risk assessment:

> **"Risk assessment is a practical management tool rather than a purely scientific endeavor. It is useful for predicting the outcomes of activities such as chemical use or disposal, or species introductions, or for attributing observed effects to potential causes in a retrospective analysis. Risk assessment can generate enough understanding to**

4. Summary

A "technology with alternatives" approach to water quality regulation is imperfect. It is based on the use of technology, which can both over-regulate and under-regulate. However, it is a proven method of regulation that focuses on the pollutant, and maintains a uniform level of protection for water quality. Further, by allowing the use of alternatives, this regulatory mechanism seeks to limit the effects of "demoralization costs" associated with technology-based regulations. Although implementation of alternatives will likely prove difficult, regulators can minimize the difficulties by focusing on the goal of water quality and creating a standard of no increase in water quality degradation compared to the technology control. Whether this standard can be achieved in all situations is unknown. However, use of ecological risk assessment may help to minimize uncertainty.

Now that an enforcement mechanism has been suggested for §303, we turn to other "alternative approaches," including some water quality-based approaches, with a critical eye to see if they offer a more practical means of dealing with diffuse sources of pollution. Some of these alternatives suggest §303s failure stems from use of ambient-based standards.[174] Others suggest specific water quality approaches, including

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allow informed decision making relative to choosing among several remedial actions. It is an especially important tool if the resources needed to reduce risk are limited, if competing options exist, or if the relative value of each action is not obvious." ***Id.***

[174] ***See*** **Houck,** ***supra*** **note 117.**

watershed management.[175] Still, others suggest the use of Public Choice Theory to better understand the non-legislative influences on the regulatory process.[176]

Some commentators point to the effectiveness of a scheme based on controlling land use through the employment of "bargaining entitlements." These entitlements serve as a means of dealing with "costs" associated with technology-based regulations.[177] Others suggest ambient-based approaches are the only means of proper regulation.[178] We now turn to details of these alternatives, and compare them with the "technology with alternatives" approach described above.

VI. Other Alternative Approaches

1. Water Quality-Based Measures

Water quality-based regulation attempts to regulate pollution discharges by comparing the individual discharge's impact to the overall water quality of the watershed.[179] Section 303 of the CWA provides a structure for water quality-based regulation.[180] However, as discussed above, this structure has provided inadequate

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[175] ***See generally*** **Scott D. Anderson, Note,** ***Watershed Management and Nonpoint Source Pollution: The Massachusetts Approach*****, 26 B.C. ENVTL.AFF.L.REV. 339 (1999).**
[176] ***Id. supra*** **note 106.**
[177] ***See*** **Pedersen,** ***supra*** **note 171.**
[178] ***See*** **William F. Pedersen, Jr.,** ***Turning the Tide on Water Quality*****, 15 ECOLOGY L.Q. 69 (1988).**
[179] ***See*** **Houck,** ***supra*** **note 117.**
[180] ***Id.***

protection to waterbodies from nonpoint source polluters. Reasons include a lack of scientific data, political influences, and weak enforcement mechanisms. Many have commented on these problems as being the main reason §303 has not contributed to significant nonpoint pollution reductions. However, others have suggested ambient-based regulations, under proper circumstances, offer a significant advantage over technology-based regulations.

a. Water Quality Approach

Ambient-based standards focus on the goal of water quality. To achieve this goal, each individual discharger is analyzed, and their particular affect on water quality is determined. This results in specific regulations catered to each discharger's contribution.

Technology standards, to the contrary, focus on the pollutant, and thereby regulate dischargers unevenly.[181] This uneven regulation does not account for the variability in water quality from one location to another.[182] Moreover, there is no consideration of a particular polluters impact on water quality.[183] The result is an inefficient regime that over-regulates for the sake of environmental quality, and under-regulates true polluters.[184]

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[181] ***See*** **Pedersen,** ***supra*** **note 178, page 81.**
[182] ***Id.***
[183] ***Id.*** **at 76.**
[184] ***Id.***

One proposed solution to the uneven regulation under a technology regime is to allow dischargers to trade technology-based reduction obligations.[185] As an example, one discharger, with high environmental compliance under a BAT-imposed standard, could pay another discharger, with low environmental compliance, to further reduce their discharges by a specified amount.[186] The first discharger could increase its discharge in proportion to the amount of discharge decreased by the second discharger.[187] This would result in the same level of environmental protection at a lower cost, with a more "individual-specific" regulatory mechanism. Thus, a water quality-based goal is achieved. However, upon reflection, we see this is not currently possible.

Regarding nonpoint dischargers, the presumption here is a particular dischargers impact on the water can be readily identified. Indeed, in order for a discharger to trade his reduction obligation, it must first be shown the discharger is meeting his obligation implementing reduced controls. This would require a detailed understanding of the particular discharger's impact on water quality. However, as noted above, the scientific ability to determine individual contributions is strained. As a result, there is no definitive proof the discharger is meeting his discharge reduction obligation. Of course, this may be possible in time. However, we cannot wait for science to "catch-up" while the quality of our waters degrade, and state regulations become subject to court challenges based on causation.[188]

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[185] *Id.* at 84
[186] *Id.*
[187] *Id.*
[188] *See* Houck, *supra* note 117, at 77.

A "technology with alternatives" approach, as suggested above, should be implemented in place of a water quality-based regime. This scheme will regulate some dischargers unfairly. However, it ensures consistent regulation! It does this by changing the focus from "causation" and "significance of harm" to the true cause of water quality impairment, the pollutant.[189] Moreover, the discharger can opt for alternatives, allowing for an individualized regulatory mechanism to control its discharges. These alternatives would be based on an in-depth assessment of the particular discharger's contribution to the water body.[190]

Dischargers also have a financial incentive to engage in activities such as data collection because it may lead to a more cost-effective control. Such an incentive would help to expedite the development of alternatives through data collection and in-depth water quality assessment. This helps alleviate the burdens placed on states and the EPA under the current regime because assessments can be done on an individual basis, and the information can be gathered incrementally. In the meantime, water quality is improving through the use of technology controls.

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[189] ***See*** **Houck, *supra* note 167, at 418.**

[190] **The idea here is the BAT acts as an initial standard that ensures a level of water quality protection. Then, water quality-based initiatives would be considered on a case-by-case basis. Of course, the discharger, along with the local community, would have the choice of if, and when, a transition could be safely made from a BAT to water quality standard. EPA would maintain final approval based on a mandate ensuring the water quality initiative would create an equal or better level of protection from the initial BAT standard.**

b. Watershed Approach (Massachusetts Watershed Initiative Example)

Other water quality-based measures offer the alternative approach of a watershed-based resource management plan.[191] Nonpoint source regulation is accomplished by, "focusing on the watershed as the relevant environmental entity."[192]

Through a watershed plan, local interests develop a team approach that allows the individuals who live in the watershed to determine the current uses, problems, and potential solutions to water quality issues.[193] This information is then presented to one person, who is responsible for public funding.[194] This person then makes a determination of how to best allocate resources depending on the information gathered.[195]

Some states, including Massachusetts, have adopted this management scheme.[196] Its strong points include community involvement, a streamlined process, and reduced political fragmentation. Weaknesses include the same problems associated with ambient-based regulations in general; lack of science, no specific criteria, and no enforcement mechanisms.

Arguably, it would be the state's responsibility to finance the local watershed teams. This would include financial assistance for data collection, analysis, and drafting.

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[191] ***See*** **Scott D. Anderson, Note,** ***Watershed Management and Nonpoint Source Pollution: The Massachusetts Approach*****, 26 B.C.ENVT.AFF.L.REV. 339, 339 (1999).**
[192] ***Id.***
[193] ***Id.*** **at 366**
[194] ***Id.***
[195] ***Id.***
[196] ***Id.*** **at 377.**

Further, assuming some water quality impairments could be identified, states would be required to fund the abatement. Such a process would be expensive and time consuming.

A "watershed" based approach gives no incentives for dischargers to seek ways to prevent pollution because it does not place the responsibility on the discharger. Because dischargers have no specific duties, they have no interest in abating pollution. Given the added difficulty of properly identifying and assessing nonpoint dischargers contributions, states would be left with voluntary compliance by the dischargers through proposals and state subsidies. Otherwise, the state would find itself subject to litigation where the discharger would be able to claim a lack of "causation" under the state regime. Moreover, it is highly conceivable this process would result in a great expenditure of money in return for a small success of pollution abatement.

Under a "technology with alternatives" approach, the discharger would be subject to strict regulations imposed by federally enforced permits. The discharger, if feeling justified, would be given the opportunity to propose alternative mechanisms to control its discharges. This creates an incentive for the discharger to become involved in pollution abatement, because the discharger is financially committed to the endeavor as a result of BAT requirements.

The discharger may wish to engage in a watershed management approach as an alternative to the BAT standard. Certainly, since the state has an interest in clean water, they could work as partners to achieve the same goal. However, it is imprudent to assume the discharger, at the outset, has any vested interest in clean water. To the contrary, the discharger has no such interest unless it becomes a financial issue.

Ambient-based regimes fail at placing a serious financial burden on nonpoint polluters, specifically agricultural operations.

BAT ensures environmental regulators have a financial interest in water quality because it requires the expenditure of money. At the same time, BAT standards ensure a "minimum level" of environmental protection where each discharger is subjected to the same controls.

One problem with BAT standards, as noted above, is they do not discriminate between significant and insignificant dischargers. One result may be a "demoralization" of the dischargers who feel they will be regulated significantly, no matter the level of pollution they are discharging. To combat this, and take advantage of innovation, an alternatives approach should be adopted under nonpoint regulation. Dischargers can prove, through empirical evidence, that a non-BAT regulation placed on their particular discharge will maintain water quality. Such a regulation encourages cooperation between federal, state, and private industry. More importantly, it serves the ultimate purpose of preventing water quality degradation.

The MWI might be a good example of a systematic approach to an alternatives scenario after implementation of BAT standards. Indeed, much of the MWI is premised on the idea of sufficient data collected by local "watershed teams." However, there is no indication these teams will have available resources in order to accomplish the most basic level of useful water quality assessment.

Faced with implementing BAT requirements, discharges now have a vested interest in helping to develop water quality standards. Certainly, dischargers who feel

they are being over-regulated have the opportunity to show their impact on water quality is minimal. Once this is established, an MWI "system" can help to propose an alternative measure of regulation for the particular discharger. This creates a cost-effective measure for the discharger, as well as helping the state develop accurate water quality assessments.

2. "Strict" Technology-Based Approach

a. BAT Regulation

A "strict" technology-based approach can be defined as using a BAT standard as the primary mechanism to control water pollution. It is a useful and easy standard to apply. Benefits include a universal standard for environmental protection. It is also highly objective. If you commit a discharge of a pollutant, you must employ this technology.

The objectivity of BAT avoids many of the political and private influences that can dominate a more subjective standard, such as ambient-based controls. However, its objectivity also makes the BAT standard extremely rigid. Such rigidity arguably causes dissent rather than support in the regulated community. Still, the effectiveness of BAT standards in controlling pollution cannot be denied.[197]

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[197] Initially, BAT standards were implemented in the Clean Water Act in 1972. Federal Water Pollution Control Act Amendments of 1972, Pub.L.No. 92-500, 86 Stat.816. The CWAs technology standards approach has since been adopted by,

One problem associated with BAT standards is it focuses on the pollutant in regulating discharges. By doing so, there is no analysis of a particular dischargers influence on the water body. Instead, each discharger is regulated to the same degree regardless of their effect on water quality. There is no consideration of individual affects under technology-based controls.

Some dischargers argue such regulation is unfair because it regulates polluters and non-polluters in the same manner. This amounts to a "guilty" mentality for dischargers. This can lead to a "social demoralization" because dischargers feel they are being penalized. However, because of a lack of understanding of water system dynamics, the BAT standard, although unfair at times, is the only measure that has worked meaningfully and consistently across broad ranges of industries at protecting water quality.

"Technology with alternatives" gives the regulated community the opportunity to "prove their innocence" by allowing for non-BAT regulations. It essentially "fills in the gaps" associated with strict BAT controls. By allowing the regulated community the opportunity to "prove their innocence," this strategy incorporates a flexible element that is likely necessary for the future of water quality enhancement.[198] Certainly, the history

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inter alia, the Clean Air Act, 42 U.S.C. §§7401-7671q; by the Resource Conservation and Recovery Act, 42 U.S.C. §§6901-6992k; and the pollution control programs of the European Union, *see* Council Directive 76/464, 1976 O.J. (L 129/23).

[198] In looking at the history of water quality management, we see a great divide between technology-based regulations and water quality-based regulation. Industries that have historically been treated as nonpoint dischargers, and exempted from federal regulation, are against implementation of strict controls such as technology-based regulations. Meanwhile, they favor a water-quality based control because it does not provide specific regulatory mechanisms. However, these

of the CWAs regulation of nonpoint discharges has shown unwillingness on the part of the regulated to be forced into a compliance regime. However, the result has been the continued desecration of our inland and coastal waters. Maybe by giving nonpoint dischargers the opportunity for alternatives, forces opposed to strict regulatory measures will soften.

Some advocates of BAT look to its history of success. They take note of the unsuccessful role water quality-based initiatives have played in controlling water pollution, and by process of elimination, determine BATs to be a superior mechanism of pollution control. Others have noted a BAT standard is, many times, insufficient at controlling certain levels of pollution. As a result, some commentators suggest a post-BAT measure should be adopted.[199]

b. Post-BAT Regulation

A post-BAT regulation would identify industries and stream segments that are not meeting water quality measures under an initial BAT program. Additional requirements would be implemented to impose water quality-based limitations on these industries and

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regulations are inefficient, and do not contribute to water quality. Thus, it is apparent successful regulation must combine an approach that actually improves water quality while remaining flexible to prevent alientation of the nonpoint discharge community.

[199] *See* Jeffrey M. Gaba, *Federal Supervision of State Water Quality Standards Under the Clean Water Act*, 36 VAND.L.REV. 1167, 1216 (1983).

areas.[200] Section 302 of the CWA has been suggested as a mechanism to implement this strategy.[201]

The notion of post-BAT regulations is an enticing idea, and not wholly unrelated to the technology with alternatives approach discussed in this article. However, a post-BAT regulation requires federal or state involvement in the identification and further regulation of BAT controlled sources. Such a scheme carries with it all of the problems associated with water quality-based regulations in general.

One must be able to determine the extent of a nonpoint dischargers "influence" on the water body after BAT implementation. Such a determination is scientifically impractical at this time. Further, costs for proper assessment and identification would be substantial, and likely come from a public source. Finally, this process extends a "command-and-control" ideology that places additional regulations on private dischargers, and makes the problem of "private influences" more available due to local public administration under a water quality-based standard that is enacted by the states.

Instead of *requiring* post-BAT regulations, as is suggested above, what about *allowing* post-BAT regulations? This is precisely what the "technology with alternatives" approach suggests. By requiring BAT on nonpoint dischargers, you are creating an objective system that can be regulated. Further, by allowing alternatives, at the election of the discharger, you are providing a mechanism whereby nonpoint dischargers have a vested interest in water quality. The mechanism is choosing between

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[200] ***Id.***
[201] ***Id.***

BAT, or some other alternative that is more cost effective and still maintains water quality.

Most nonpoint dischargers will be readily able to deal with this concept because it reflects the normal "business judgment" most dischargers deal with on a regular basis. Moreover, through business judgment, nonpoint discharges will be able to determine the "value" of water quality because the "initial" value has been achieved through BAT. If they can find a less expensive means of protecting the water to the same degree, then that less expensive means becomes the "value" of protecting the water. This results in a more accurate measure of "environmental value" because it is based on market forces.

A technology with alternatives approach avoids the subjective elements inherent in a water quality approach. The post-BAT standard recognizes the importance of implementing controls beyond BAT. However, this recognition is based on the idea that BAT does not go far enough. As a result, post-BAT controls focus on a public-generated program to regulate additional sources of pollution. Since BAT has already been used as a regulatory regime, the post-BAT "secondary" control suggested is an ambient-based program run by the states. However, this form of regulation does not work because of all the usual suspects; lack of science, political willingness, and regulatory strength. Instead, a "technology with alternatives" approach keeps the objective element of BAT, and allows for alternatives based on market forces. Most importantly, the alternatives are granted at the election of the discharger, not through a federal or state regulatory mandate.

3. Pollution Tax Approaches

Another alternate form of water pollution control is pollution taxes. Pollution taxes are premised on the idea that water quality is a resource that can be regulated adequately under market forces. Under this theory, the "costs" of polluting are given a financial value, forcing interested parties to consider the quality of the water in the operation of an activity that causes pollution. Generally, the tax can be placed on either the polluter or the polluted.

a. Polluter Pays

Under one form of pollution tax, the discharger pays a tax on each increment of pollutant s/he discharges into the water.[202] This allows for a cost-benefit analysis where the discharger will employ pollution control measures when they are less expensive than polluting.[203] The difficulty in a pollution tax scenario is giving an adequate value to "water quality" in order to ensure it creates an incentive for the discharger to not pollute. Alternatively, an overvaluation of environmental quality will result in the discharger being penalized for the sake of water quality.

This form of pollution control makes a recurring, but fatal assumption. It assumes "environmental quality" can be prospectively reduced to a "dollar-for-dollar" value with costs of doing business. This simply is not true. Of course, you can ensure

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[202] ***See*** **Zaring,** ***supra*** **note 63, 533.**
[203] ***Id.***

environmental quality is considered by creating an immense value for its' quality. However, by doing so, you are likely making it impossible for the discharger to stay in business. So, you protect the environment but lose business in the process. This is an unreasonable result. So too is the result where the environment is not given enough value so there is no incentive for the discharger to abate pollution.

The problem with this tax approach is it attempts to *create* a monetary value for environmental quality, which is a wholly subjective thing. More importantly, this approach attempts to create a monetary value *before* regulation. This can result in inconsistent regulation, as mentioned above, because there is no objective basis for setting the tax amount. A better result is creating a monetary value for environmental quality *after* regulation. This is precisely what a "technology with alternatives" control accomplishes.

BAT standards with the possibility of alternatives is a more accurate approach to development of market forces. The BAT standards act like the regulation of a tax. However, they are uniform, and do not require a subjective analysis of "value."[204] Moreover, by allowing for alternatives, the discharger is given the same decision-making ability as employed under the pollution tax standard. Either implement the BAT, or come up with a cheaper, but just as effective, alternative. In addition, by defining alternatives,

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[204] Generally, under a pollution tax scenario, economists are employed to set an initial value for the environmental harm. This "value" is based on a number of *assumptions* necessarily imposed on economists when making initial evaluations. It is the authors belief there are significant unknowns that already exist in water quality protection. Thus, the addition of assumptions will only add to an already complicated regulatory regime. Conversely, use of technology controls creates an *objective* value for water quality, which we know creates some level of water quality through the control of pollutants.

the discharger is now helping to ensure precise environmental quality, something that is lacking in this pollution tax scenario. Thus, through the use of BATs with alternatives, the goals of the pollution tax are achieved, but in a more objective, and proportional manner.

b. Environmentalist Pays

A second form of pollution tax has been suggested. Here, those who value environmental quality pay a tax to ensure the existence of clean water. The money generated can then be used to pay for agricultural nonpoint pollution control programs.[205] However, this program is less attractive then a BAT with alternatives because it offers less incentives to dischargers for innovation. Further, in the context of water pollution, it cannot reasonably be implemented.

A discharger who is not made to account for its affect on water quality will never see "value" in water quality. Without seeing "value" in water quality, the discharger has no incentive to abate water pollution. However, by requiring BAT implementation, you force the discharger to consider the costs associated with pollution. As such, water quality now has value to the discharger. Further, by allowing alternatives, you create an incentive for dischargers to develop alternate forms of regulation. Now the discharger has a vested interest in the development and maintenance of water quality.

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[205] *See* Zaring, *supra* note 63, 536.

A fundamental characteristic of water is it flows through state boundaries. As a result, an "environmentalist pays" tax runs the risk of insufficiently addressing water pollution problems because of the diversity of dischargers. Under this proposal, residents of Texas or Louisiana may be asked to pay for pollution controls at farms in Ohio so they can enjoy fishing in the Gulf of Mexico. How would this be implemented? Would the federal government place a "use" tax on residents of certain states who enjoy water quality? If so, how would these residents be identified? Beyond the serious constitutional questions, this proposal suffers from the similar problems as the current water quality-based regulation under §303, a goal with no possibility of adequate implementation.

Conversely, a "technology with alternatives" approach is implemented through the same process as BATs with point source implementation under the CWA. Further, once BATs were established and enforced, alternatives would be a viable implementation option at the discretion of each regulated discharger. This is one of the most effective points about a "technology with alternatives" approach; it follows in the footsteps of thirty years of point source implementation, not to mention its history with other regulatory mechanisms.

4. Public Choice Theory

Public Choice Theory (PCT) can be characterized as, "an economic analysis of the nonmarket decision-making of the public arena."[206] In the context of nonpoint source pollution regulation, it focuses on "the influential roles farmers play in the context of the pollution legislation."[207]

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[206] ***Id.*** **at 516.** ***See*** **also, Paul Starr,** ***The Meaning of Privatization,*** **YALE L. & POL'Y REV. 6 (1988) Providing a definition of public choice:**

> **"'Public choice,' ill-named because the only choices it recognizes are essentially private, is both a branch of microeconomics and an ideologically-laden view of democratic politics. Analysts of the school apply the logic of microeconomics to politics and generally find that whereas self-interest leads to benign results in the marketplace, it produces nothing but pathology in political decisions. These pathological patterns represent different kinds of 'free-riding' and 'rent-seeking' by voters, bureaucrats, politicians, and recipients of public funds. Coalitions of voters seeking special advantage from the state join together to get favorable legislation enacted. Rather than being particularly needy, these groups are likely to be those whose big stake in a benefit arouses them to more effective action than is taken by the taxpayers at large over whom the costs are spread. In general, individuals with "concentrated" interests in increased expenditure take a 'free ride' on those with 'diffuse' interests in lower taxes. Similarly, the managers of the 'bureaucratic firms' seek to maximize budgets, and thereby to obtain greater power, larger salaries, and other perquisites. Budget maximization results in higher government spending overall, inefficient allocation among government agencies, and inefficient production within them. In addition, when government agencies give out grants, the potential grantees expend resources in lobbying up to the value of the grants--an instance of the more general 'political dissipation of value' resulting from the scramble for political favors and jobs."**

[207] ***Id.***

PCT serves two functions in understanding the dynamics of nonpoint source regulations: it identifies a major "roadblock" to implementation of effective nonpoint source pollution regulation; and it offers insight into what form of regulation, other than what is currently enacted, may be digestible by these influences. Thus, by identifying influences associated with nonpoint source pollution, PCT impliedly suggests an alternative approach that limits these influences.

PCT identifies the farming industries major role in influencing both federal and state regulation. As a private participant, farmers will look out for their best interest. Further, in numbers, their personal interests create a political influence on decisionmakers. It is this influence, defined under PCT, that allows for the creation of lax laws. This is important because, as noted above, farming operations are the most significant contributors of nutrients to our coastal waters. Further, farming operations have traditionally been exempted from meaningful regulation, and where regulated, have been considered nonpoint sources of pollution.[208] The result has been the adoption of a plan that does not work, and immense resistance to anything that sounds like regulation.

PCT offers an explanation as to why ineffective regulations have been supported by Congress. In what he terms, "a lack of political will," Oliver A. Houck points to the significant political influence exhibited by the farming industry.[209] This significant influence creates a dynamic whereby our elected officials will do what's best, not based on normal market forces, but for their political future. Certainly, the farmers want as

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[208] *See* Zaring, *supra* note 63, at 516.

[209] *See* Houck, *supra* note 117 at 132-133 (describing how private influences shape political choice at the local and federal levels).

little regulation as possible. However, granting this request has done, and will continue to do, little with respect to obtaining any reasonable level of water quality. Thus, we must regulate this industry. However, we must also be conscious of the influence this industry maintains, and offer them a say in how they are regulated.

A "technology with alternatives" approach may be the answer. It is the only system that will allow farmers some say in the process while at the same time providing an enforceable measure of water quality protection. Certainly, farmers will be against direct federal regulation through BAT implementation. However, the possibility of alternatives, at the farmer's election, will act like the "spoonful of sugar," and help the "BAT medicine" go down. In other words, by requiring BAT, but offering alternatives, you are suggesting the farmer, or discharger, has a say in the matter. You are not foreclosing the possibility of reduced regulation. However, you are requiring a show of proof by the farmer. This makes the system fair, and fairness breeds acceptance. Indeed, such a form of regulation may be the only answer to solving the "new" water quality dilemma.

5. Federal Control of Private Land through Use of Bargaining Entitlements

Some commentators have suggested the need to control private lands in order to obtain total water quality under the CWA.[210] They suggest current regulations are inept

[210] ***See*** **Pedersen,** ***supra*** **note 171.**

at controlling nonpoint sources because this involves the control of land use.[211] In order to prevent nonpoint discharges from a farming operation, you necessarily have to place restrictions on how the land is used.[212] However, public control of private land use results in "rival" choices where only one activity can take place on the land, agriculture or water quality preservation.[213] This is different from point source regulations, specifically industrial sources. In order to control these sources, all that is required is control of the discharge itself. There is no need to control the land upon which the industry is based.[214]

According to this school of thought, federal regulations have failed at controlling nonpoint sources because the regulations do not provide for adequate private land-use controls.[215] One main reason why land use restrictions have not been implemented is because such federal intervention on private land raises substantial questions of federalism and takings issues.[216] Bargaining Entitlements have been suggested to combat these problems, and provide a means of regulation.

Bargaining Entitlements are rights given to regulatory agencies that allow the agency to negotiate an entitlement, like a regulatory requirement, in exchange for

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[211] ***Id.***
[212] ***Id.***
[213] ***Id.*** **Discussion of the term "rival" is given at footnote 6. The term is used in the economic context where "rival" uses necessarily means one use excludes the other.** ***Id.*** **at footnote 6. Examples are given where two claims to eat the same hamburger are considered "rival" because only one claimant can actually eat the burger.** ***Id.*** **Thus, the suggestion is a regulatory mechanism that attempts to control land used in a manner that includes polluting must necessarily exclude the activity causing the polluting because the interests are "rival."**
[214] ***Id*** **at 1.**
[215] ***Id.***
[216] ***Id.*** **at 4.**

environmental quality.[217] As an example, a discharger would be able to continue discharging their pollution in exchange for preserving a pristine riparian area along a polluted river. As long as the "environmental gain" of preserving the riparian area is equal to or greater than the gain that would have been realized through regulation, the net is a gain in environmental quality. The benefits associated with this mechanism of environmental regulation include discharger participation, cooperation, and integration with community-based watershed protection.[218]

Bargaining Entitlements seek to limit the demoralizing costs associated with federal regulation of private land use in the same manner as the "technology with alternatives" approach discussed in this article. However, the bargaining entitlements approach is based on a number of flawed assumptions, the most important being the belief that federal regulations of private land in fact create "rival" choices, thereby excluding the possibility of continued use of the resource by the discharger. However, the suggestion that land use control creates "rival" uses does not stand up to analysis using an example of agricultural operations.

Assuming nonpoint regulation using a "technology with alternatives" approach, the regulated would be required to implement the best available technology to limit discharge of pollutants. Technology-implementation would likely include installation of buffer zones, filtration strips, and retention ponds. None of these "regulations" imposed on the discharger would prevent them from engaging in their initial activity that created the discharge. The discharger would simply be required to limit the manner in which

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[217] *Id.* at 2.
[218] *Id.* at 3.

they engage in that practice, many times in very small ways. This does not equate to a scenario where the choices are "rival", resulting in a complete dichotomy of interests.

This also works for agricultural practices including the deposit of fertilizer. BAT regulations might include a more accurate use of fertilizer to coincide with actual production of crops, instead of the common practice of over-fertilization. This is a simple technology requirement that allows the farmer to *continue* growing crops while minimizing the amount of nutrients that flow into local watersheds. Again, it can be easily seen that the restriction imposed, although restricting the use of land, does not create a competing interest that is completely "rival" to the private interest in the land.

As can be seen from the above examples, the premise that land use control cannot be achieved under normal regulatory mechanisms, because they create "rival" uses diametrically opposed to one another, is false. Indeed, there are numerous instances where public regulation of private land does not prevent the attainment of environmental quality at the expense of the private use. In fact, BATs provide an excellent mechanism for achieving the goals of divergent interests by taking these interests into consideration when developing a regulatory mechanism.

Others suggest bargaining entitlements as a means to achieve compromise with competing interests. This leads to a second flawed assumption in the bargaining entitlements theory; an equal position at the bargaining table.

Bargaining Entitlements theory suggests a practice whereby one environmental good is exchanged for another.[219] The government "exchanges" its entitlement-

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[219] *Id.* at 2.

regulatory requirements under the CWA-for an alternative that is suggested by the regulated, which the government deems of greater environmental value.[220] The assumption here is the government will be readily able to determine whether the alternative suggested is, *in fact*, of greater environmental value. However, there is no suggestion they would be able to do this.

Many times, private interests are in a superior position, both financially and in terms of manpower, to influence government decisions. Under a bargaining entitlement approach, there seems to be a presumption that requires the regulator to negotiate with the regulated, which may force the governments into making "bad deals." These "bad deals" would result from the uneven bargaining power involved. A good example can be found in ambient-based measures.

Discharger's could make use of "suggestive data" to lessen their perceived impact on water quality. This inaccurate information would form the basis of a bargaining position by the discharger. If the government did not have the ability to readily assess the "suggestive data" offered by the dischargers, they could conceivably subject themselves to a "bad deal" by exchanging a strong pollution control for a weak pollution control. Thus, the lack of manpower might form the basis of uneven bargaining strength between the regulators and regulated.

Moreover, there is no indication of what form of regulation would be required in lieu of a bargained-for alternative. As such, the assumption of equal bargaining power

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[220] ***Id.***

might leave the government at a disadvantage. The result would be a net *increase* in pollution discharge.

"Technology with alternatives" is similar to a bargaining entitlements approach in that it attempts to offer alternative measures of dealing with environmental harms. As such, one could argue, as noted above, the government is subject to the same "unequal" bargaining when dealing with alternatives. However, there are more *controls* placed into a "technology with alternatives" approach that better protect the government against abuses.

BAT standards are the set rule, not an opportunity to bargain for alternatives. Moreover, alternatives are available, but they must be proven empirically by the regulated discharger to provide adequate levels of protection. Any "uneven" bargaining would be limited by the government choosing either BATs or the alternative. There is no *requirement* the government agree to an alternative approach.

The need for control of private land is necessary in order to properly regulate nonpoint sources of pollution because these sources are based on land use. However, regulation through BAT controls does not create "rival" interests. As such, any premise based on this notion is flawed. Rather, the standard of control required to adequately address nonpoint pollution needs to be altered from water quality-based to technology-based. Once this has been achieved, the use of alternatives should be made available in order to create consistent regulatory standards based on an individual discharger's impact. "Bargaining Entitlements" may provide a manner in which alternative measures

are achieved. However, such entitlements cannot be mandatory, and must focus on the initial regulation of technology-based standards.

6. Summary

Water quality degradation from nonpoint pollution has become the focus to achieving clean water. Current regulations have failed at providing any level of water quality consistent with the goals stated in the CWA. As a result, a number of alternative approaches have been suggested. Each of these alternatives makes a point, and suggests a necessary component to long-term regulation of diffuse sources of pollution. However, they are more of a "piece of the puzzle" rather than an entire solution.

A synthesis of what has worked in the past and what is needed to implement a workable solution to nonpoint pollution leads to a "technology with alternatives" approach. This approach takes all of the best "pieces" of suggested regulation, and puts it into as neat a package as possible. Whether this "pill" will be "digestible" to the nonpoint discharge community remains to be seen. However, absent an all-encompassing federal regulatory regime, local initiatives have begun to take form. These initiatives are implementing solutions based on cooperative arrangements between state, federal, private, public, and local interests. Further, they represent a "case study" of what form of alternatives may be available. We now turn to the details of one such local initiative, and attempt to analyze the reasons for its effectiveness.

VII. Idaho's Dairy Pollution Prevention Program

The Idaho Dairy Pollution Prevention Initiative represents an unusual public-private partnership formed to resolve major environmental problems inadequately addressed by federal and state environmental agencies that traditionally regulate such problems.[221] The particular partnership here is between two federal and two state agencies, an industry group, and a state university.[222]

The development of this partnership resulted from a study conducted in 1995, which showed 280 Idaho dairies - accounting for one-fourth of the total number - were discharging untreated animal and dairy process waste to roadside ditches, streams, and ground water.[223] Attempts at EPA and the Idaho Department of Environmental Quality (IDEQ) were ineffective at treating this pollution[224], mostly because the regulatory mechanism is water quality-based, and contains no hard enforcement provisions. In addition, EPA regulates *only* those dairies with 200 or more cows. Most of the 280 dairies - approximately 70 percent - were below the 200-cow cutoff.[225] Moreover, unless a complaint was filed, it was near impossible for the dischargers to receive attention from state or federal authorities.[226]

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[221] ***See Innovative State Programs, Idaho's Dairy Pollution Prevention Initiative: Unique Program Eliminates Direct Dairy Discharges*****, U.S. EPA (Aug. 29, 2002)** ***at*** **<http://www.epa.gov/owow/nps/Section319III/innov_id.htm>.**
[222] ***Id.***
[223] ***Id.***
[224] ***Id.***
[225] ***Id.***
[226] ***Id.***

The ongoing problems with dairy manure discharges led to the drafting of The Idaho Dairy Pollution Prevention Memorandum of Understanding (Dairy MOU).[227] This document laid the foundation for a set of guidelines and criteria for monitoring dairy polluters. An innovative approach resulted. Idaho State Department of Agriculture (ISDA) trained current dairy inspectors to identify sources of pollution on dairy farms as part of their normal inspection process.[228] This served the important function of *enforcement* by ensuring regular inspections.[229] These regular inspections created an incentive for "marginal" dairy operations to become more actively involved in compliance efforts.[230]

One main reason for this programs success was the development of strict enforcement mechanisms. By ensuring compliance with regulations, violators were identified on a regular basis. Moreover, potential violators had an incentive to identify and redress compliance issues before they became regulatory violations. However, enforcement is only one variable in the equation to healthy waters. The regulations themselves must be aimed at specific sources of pollution, and require mandatory actions along with specific requirements. Here, the Idaho Initiative met all of these elements.

In early 1996, the Idaho legislature passed laws providing ISDA with authority to *require* full containment of dairy waste.[231] Under rules developed by ISDA

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[227] ***Id.***
[228] ***Id.***
[229] **Enactment of this new inspection method led to a change of dairy inspections from less that 5% of the total farms being inspected in any one year, to an assurance of <u>each</u> farm being inspected at least 2.5 times per year.** ***Id.***
[230] ***Id.***
[231] ***Id.***

implementing this law, dairies found to be in noncompliance *cannot* sell milk until they agree to *implement* a plan for corrective action.[232]

The language used in both the statute and regulations are paramount because they contain words that require specific actions, and provide for specific penalties. Moreover, the penalties are meaningful, i.e., you cannot operate your business unless you adhere to the regulations. Such a regime creates strong regulatory provisions and has strong penalties. There is no room for subjective interpretation. Certainly, if the law allowed for a *proposal*, instead of a *requirement* of full containment, or simply the *development*, rather than *implementation* of a corrective plan, there would be little to no compliance. Further, if there were no specific penalties - the inability to sell milk, and therefore maintain a livelihood - there would be little incentive to cooperate with the regulations.

The results of the Idaho Dairy Initiative speak for themselves. Since the programs inception, "ISDA has conducted more than 14,000 inspections of dairy farms, resulting in an increase in inspections from an average of 40 per year to 2,800 per year."[233] In addition, improvements in compliance have resulted in almost total elimination of discharges to the environment.[234] Section 319 funding has helped in the construction of more than 500 dairy waste containment ponds and handling facilities developed under this program.[235]

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[232] ***Id.***
[233] ***Id.***
[234] ***Id.*** **In 1996, 25 percent of the dairies had some form of discharge violation. As of 2000, the percentage has dropped to less than 0.5 percent of the dairies. In addition, violations unrelated to discharges have dropped by 76 percent.**
[235] ***Id.*** **EPA contributed more than $10 million dollars in grant money under §319.**

On the surface, the reasons for this programs success may seem complex. However, a scratch beneath the surface reveals a simple plan that strictly implements a technology-based control standard - construction of large capacity waste contaminant ponds along with application of dairy wastes to land in accordance with an approved nutrient management plan - and enforces the standard with regular site visits and strong penalties.

The regular site visits serve two functions; identify violations, and create an incentive for voluntary compliance. Identification is a major aspect to strong enforcement measures. This goes along with the old adage, "A guilty man is only guilty if he gets caught." Certainly, the ability to properly identify violators is a necessary predicate to obtaining compliance. Further, certain and expedient identification creates an incentive for "potential" violators to clean up their act.

Finally, the most integral part of this plans success is the penalty. By not allowing dairy farmers to sell milk, noncompliance by the discharger is not an option, lest they submit to going out of business. Thus, by providing stiff penalties, you create an incentive for compliance. In essence, you are making it monetarily unacceptable to avoid compliance with the regulations. Further, you are also ensuring a certain value for "environmental quality" that is more consistent than under a "bargaining entitlements" approach where the "environmental value" is meted out on the negotiating table.

The reason this plan works is because it is a regulatory scheme that is diametrically opposed to current regulation of nonpoint pollution sources. This program employs technology-based standards. The CWA does not. This program requires

specific actions, penalizes through stiff penalties, and uses strong enforcement mechanisms to keep dischargers in check. Current federal regulatory programs fail at most, if not all, of these components. Instead of focusing on the pollutant, the current regulatory regime focuses on special interests under the "cloak" of individual affect.

A "technology with alternatives" approach would require the strict adherence to a certain standard, by all, and allow for a variation from that standard, on an individualized basis. However, any variation is secondary to the primary goal of water quality attainment. If the goal will be more clearly advanced through technology standards, then these standards should be followed precisely.

VIII. Conclusion

Our coastal waters represent an important economic, cultural, and spiritual resource. Maintaining the integrity of this resource is a goal most Americans agree on. However, federal regulations have failed at preventing pollution from harming this resource.

The major source of harm presented to our coastal waters is eutrophication through nutrient enrichment. Nutrient enrichment leads to dangers such as toxic algal blooms, which deplete the ocean water of its oxygen, resulting in conditions of hypoxia. This hypoxia serves as the basis for fish kills and ecosystem degradation.

Agricultural operations are providing the main vehicle for nutrients reaching coastal waters. Although these operations have been regulated through a variety of

federal laws, current regulations have failed to provide a substantial measure of protection. The main reason is these laws focus on ambient-based regimes, or they limit the effectiveness of the regulation through inept regulatory, enforcement, and penalty provisions. Altering the regulatory mechanism of §303 of the CWA to control nonpoint sources, including agriculture, under a "technology with alternatives" approach would reduce marine coastal pollution.

A "technology with alternatives" approach would allow for increased protection of our coastal waters through better regulation of nonpoint dischargers, especially agricultural operations. Technology-based regulations have proven reliable in controlling pollution dischargers because the approach is objective, and focuses on the pollutant rather than the discharger. Under this approach, all dischargers would be subject to best available technology implementation. After implementation, individual dischargers, through empirical evidence, may suggest the use of an alternative to the technology standard. If the alternative provides a similar, or better, level of protection, regulators may allow for the alternative measure to be implemented.

The alternatives consideration would allow for a more appropriate level of regulation in line with the dischargers affect on water quality. Also, a "technology with alternatives" approach would establish strict regulatory, enforcement, and penalty provisions.

There are problems associated with a "technology with alternatives" approach. These problems include inconsistent regulation resulting in "demoralization costs." Moreover, there are questions as to how an "alternative" approach suggested by a

discharger would be implemented. However, through the option of alternatives, and the use of a standard applying a principle of "no increase in water quality degradation," this method of regulation minimizes these problems and affords the best possible regulatory regime for nonpoint pollution sources.

Commentators in this area of law have offered other alternative regulations for nonpoint source pollution. Each of these alternatives makes a point, and suggests a necessary component to long-term regulation of diffuse sources of pollution. However, they are more of a "piece of the puzzle" rather than an entire solution. As a result, they do not offer an effective mechanism for dealing with nonpoint pollution sources. Instead, a "technology with alternatives" approach offers the best opportunity for nonpoint source regulation.

One innovate state program, the Idaho Dairy Pollution Prevention Initiative, offers a good example of technology-based controls on a nonpoint pollution source that is supplemented by strong regulatory, enforcement, and penalty provisions. The result has been a measured success at controlling nonpoint pollution sources. This example can be used to show how a "technology with alternatives" approach may be implemented, and the overall success of a strong regulatory regime.

The future of our coastal ocean health is uncertain. We need to weigh the interests of agriculture against the varied interests of our coastal regions. If we continue with a *laissez-faire* attitude towards nonpoint pollution, it will be our local watersheds and coastal oceans that lose. Implementation of a "technology with alternatives"

approach to nonpoint source pollution will adequately regulate agricultural operations, and provide the protection our costal waters need from nutrient enrichment.