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EPA's TMDL Program

*Sarah Birkeland**

Nonpoint source pollution threatens to erase much of the progress achieved by the Clean Water Act (CWA) in restoring the nation's water resources. The most promising and controversial tool the CWA offers to address this growing problem is contained in the Total Maximum Daily Load (TMDL) provisions of Section 303(d). This Note summarizes EPA's final rule implementing Section 303(d) and the TMDL program, places Section 303(d) in the context of other regulatory approaches to pollution abatement, and discusses several challenges the program faces.

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INTRODUCTION

On July 13, 2000, EPA published its final rule implementing Section 303(d) of the Clean Water Act (CWA).[1] These new regulations promise a dramatic shift in regulatory emphasis. For the first time, the CWA's link between water quality standards and nonpoint source pollution will be put to the test through EPA's Section 303(d) Total Maximum Daily Load (TMDL) program. While the CWA enjoys remarkable success in cleaning up point source discharges to the nation's waterbodies, it has until now virtually ignored nonpoint source pollution. EPA's new TMDL regulations tackle this serious and widespread water pollution problem with the water quality-based approach to pollution abatement contained in Section 303(d). This approach regulates polluters using in situ measures of water quality rather than restrictions on end of pipe discharges.

In the past, water quality standards have played a lesser role as planning rather than enforcement tools.[2] In response to the burgeoning nonpoint pollution problem, EPA's final rule pushes water quality standards to the front lines of pollution abatement. Under Section 303(d), states are required to identify and list those waters for which technology-based controls have failed to achieve the applicable water quality standard.[3] States must identify the pollutants causing the impairment and establish a TMDL for each pollutant allowed to flow into the identified waterbody.[4] The TMDL places a cap on pollutants so that the applicable water quality standard is not exceeded, allowing for seasonal variation and a margin of safety.[5] In order to meet water quality standards under the new TMDL program, states must allocate pollutant load reductions among sources in a watershed. This step will certainly change the politics of water

1. *See* Water Quality Planning and Management Regulation, 65 Fed. Reg. 43,585 (July 13, 2000) (to be codified at 40 C.F.R. pts. 9, 122, 123, 124, 130).

2. *See generally* WILLIAM H. RODGERS JR., ENVIRONMENTAL LAW (2d ed. 1996).

3. *See* 33 U.S.C. § 1313(d)(1)(A) (2000). The standards referenced in Section 303(d)(1)(A) are the "best practicable control technology" standards of Section 301(b)(1)(A) and secondary treatment for publicly owned treatment works under Section 301(b)(1)(B). 33 U.S.C. § 1311(b)(1)(A), (B) (2000).

4. *Id.* § 1313(d)(1)(C).

5. *Id.*

pollution control; for the first time, the allocation will encompass previously unregulated nonpoint sources.[6]

The new regulations compel states to address nonpoint source pollution in order to achieve the pollutant load reductions necessary to meet TMDLs because, in many instances, technological fixes for reducing point source discharges have approached their cost-effective limit.[7] Even if greater reductions could be squeezed from point sources, states and EPA cannot avoid addressing nonpoint sources, now the leading cause of impairment to the nation's waters.[8] Based on a reading of Section 303(d) supported by a recent district court decision in California, EPA's new regulations expressly incorporate nonpoint source pollution into the TMDL program.[9] EPA's mobilization of the TMDL program to address nonpoint source pollution is sending shock waves through traditionally unregulated industries.[10]

TMDLs provide a critical baseline sorely lacking in previous attempts to abate nonpoint source pollution. They hold states to the attainment of the water quality standards each state developed for the lakes, rivers, streams, and estuaries within its borders.[11] Unfortunately, TMDLs come at a high price.[12] Estimates of development costs run from roughly four thousand

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6. James Boyd, *The New Face of the Clean Water Act: A Critical Review of the EPA's Proposed TMDL Rules* 4 (Mar. 2000) (Discussion Paper 00-12, Resources for the Future) (on file with author).

7. *Id.* at 6.

8. *See* Water Quality Planning and Management, 65 Fed. Reg. 43,568, 43,587 (July 13, 2000).

9. *See* Pronsolino v. Marcus, 91 F. Supp. 2d 1337 (N.D. Cal. 2000).

10. The FACA committee appointed by EPA to develop recommendations for the new TMDL regulations illustrated the divide; committee members were unable to reach a consensus on whether Section 303(d) applied to nonpoint sources. Oliver A. Houck, *TMDLs III: A New Framework for the Clean Water Act's Ambient Standard Program*, 28 ENVTL. L. REP. 10,415, 10,421 (1998) [hereinafter Houck, *TMDLs III*]. Agricultural interests on the committee read Section 303(d) to apply where NPDES effluent limitations have failed to achieve the applicable water quality standard. Accordingly, Section 303(d) can only be triggered for waters with point source dischargers where water quality standards continue to be violated, *not* for waters impaired solely by nonpoint pollution. *Id.* A recent California district court decision discussed in this issue flatly contradicts this reading of Section 303(d). *See Pronsolino*, 91 F. Supp. 2d at 1337; *see also* Debbie Shosteck, Note, Pronsolino v. Marcus, 28 ECOLOGY L.Q. 327 (2001).

11. *See* 40 C.F.R. § 130.32.

12. For example, it cost the Oregon Department of Environmental Quality one million dollars to establish one TMDL for one river. Craig N. Johnston, *Don't Go Near the Water: the Ninth Circuit Undermines Water Quality Enforcement*, 24 ENVTL. L. 1289, 1314 (1994); *see also* Mark T. Pifher, *The Clean Water Act: Cooperative Federalism?*, NAT. RESOURCES & ENVT., Summer 1997, at 36 (questioning how the states will be able to afford the data-intensive TMDL program).

to one million dollars per TMDL, not including the cost of implementation.[13] One of the more expensive attributes of an ambient approach to pollution control is its dependence on monitoring and modeling to establish causal responsibility for damage. Uncertainty associated with monitoring and modeling also generates substantial indirect costs through a never-ending wrangling over the accuracy of the data underpinning load allocations and re-allocations and the assessment of TMDL violations. The high start-up and administrative costs associated with TMDLs are particularly disquieting as the controls themselves are often inexpensive, readily available, and technically simple.[14]

The most effective nonpoint source pollution control measures implicate land use management, and therein lies the crux of many of the implementation and enforcement challenges faced by the EPA's TMDL program. These measures include land use strategies such as zoning, and source specific controls such as best management practices (BMPs).[15] Yet Congress never intended EPA to regulate state and local land use practices.[16] As a consequence, EPA has no choice but to tackle nonpoint pollution using the indirect approach embodied in Section 303(d).

If left unchecked, nonpoint source pollution will result in widespread and serious degradation of the nation's water resources. Nevertheless, it is not clear that EPA's new TMDL program can effectuate the level of change necessary to solve this difficult problem. The analysis in Part II focuses on the major hurdles to cleaning up nonpoint pollution. The first hurdle is a seemingly simple statutory definition that allows major polluters

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13. *See* Oliver A. Houck, *TMDLs, Are We There Yet?: The Long Road Toward Water Quality-Based Regulation Under the Clean Water Act*, 27 ENVTL. L. REP. 10,391, 10,401 (1997) [hereinafter Houck, *Are We There Yet?*].

14. *See* Oliver A. Houck, *TMDLs IV: The Final Frontier*, 29 ENVTL. L. REP. 10,469, 10,479 (1999) [hereinafter Houck, *The Final Frontier*].

15. A best management practice is a control measure for slowing, retaining, or absorbing pollutants produced by the surface water runoff associated with nonpoint source pollution. *See* Daniel R. Mandelker, *Controlling Nonpoint Source Water Pollution: Can It Be Done?*, 65 CHI.-KENT L. REV. 479, 483 (1989). Best management practice was not defined under the CWA's nonpoint provisions; apparently Congress did not want to limit states' flexibility in developing programs or undercut existing programs. *See id.*

16. *See* Pronsolino v. Marcus, 91 F. Supp. 2d 1337, 1355 (N.D. Cal. 2000) (stating that "[u]nlike EPA's authority to revise individual NPDES permits issued by States for individual point sources, EPA received no authority to review land-use restrictions placed (or not placed) on timber-harvesting permits by [California Department of Forestry] or any other practice permitted for agriculture or silviculture." *Id.*

to escape effective regulation. Parts II.A and II.B discuss the challenges stemming from the nature of nonpoint pollution, and from the choice of an ambient approach for dealing with it. Part II.C addresses land use. The following background section places the TMDL program in the context of the CWA and provides a more detailed introduction to EPA's new TMDL regulations.

I
BACKGROUND

A. *Clean Water Act Section 303(d)*

1. *The Clean Water Act's Dual Regulatory Strategies*

The CWA is considered one of the environmental movement's success stories.[17] It is responsible for a dramatic reduction in industrial discharges into the nation's waters[18] and, through federally funded improvements to municipal treatment works, for a 50% reduction in municipal loading. The CWA's success in reducing municipal loading is an especially impressive feat when populations served by those treatment works have doubled in the same period.[19] Despite these accomplishments, most of the nation's waters are far from clean. In fact, increases in pollution from nonpoint sources are rapidly consuming past gains made under the CWA's point source control programs.[20]

Congress wrote two regulatory strategies into the CWA, one based on technological end-of-pipe standards and the other on

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17. *See* Houck, *The Final Frontier*, *supra* note 14, at 10,469; Drew Caputo, *A Job Half Finished: The Clean Water Act After 25 Years*, 27 ENVTL. L. REP. 10,574, 10,575-76 (1997).

18. *See generally* ROBERT ADLER ET AL., THE CLEAN WATER ACT 20 YEARS LATER 16 (1993).

19. *See* Houck, *The Final Frontier*, *supra* note 14, at 10,471 (citing COUNCIL ON ENVTL. QUALITY, ENVIRONMENTAL QUALITY 1994-95 271-73 (1997)).

20. *See id.* at 10,470. The principal sources contributing to water quality impairment today are nonpoint sources. The National Water Quality Inventory Report to Congress for 1998 indicates that of the 23% of the nation's rivers and streams that have been assessed, 35% do not fully support water quality standards or uses and an additional 10% are threatened. The report indicates that pollutants in the runoff from urban and agricultural land are a leading source of impairment. Agriculture is the leading source of pollutants in assessed rivers and streams, contributing to 59% of the reported water quality problems and affecting about 170,000 river miles. Hydromodification is the second leading source of impairment, and urban runoff/storm sewers is the third major source, contributing respectively 20% and 12% of water quality problems. Water Quality Planning and Management Regulation, 65 Fed. Reg. 43,585, 43,587 (July 13, 2000).

ambient water quality.[21] The CWA's technology-based standards are national in scope and are premised on the incorporation of the best available technology for reducing effluent discharges, regardless of environmental impacts.[22] Either the EPA, or an approved state agency, enforces effluent limitations against individual dischargers through National Pollution Discharge Elimination System (NPDES) permits.[23] This point source program is the basis of the Act's success, evident not only in effluent reductions, but also in the "stunning rate of imitation in other technology-based pollution control programs in the United States and abroad."[24] In contrast, the CWA's water quality-based program relies on ambient water quality standards promulgated by states and approved by EPA.[25] These standards are set at levels necessary "to protect the public health or welfare, enhance the quality of water and serve the purposes of" the Act.[26] In theory, water quality standards account for the effects of cumulative releases from diverse pollution sources. Until now, these standards played little more than a supporting role.

2. *The States: Section 303(d)'s Staunchest Supporters*

The emergence of new TMDL regulations is the result of a string of successful citizen's suits forcing EPA and the states to fulfill their duties under Section 303(d).[27] One of the ironies of

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21. *See, e.g.*, Oliver A. Houck, *TMDLs: The Resurrection of Water Quality Standards-Based Regulation Under the Clean Water Act*, 27 ENVTL. L. REP. 10,329, 10,330 (1997) [hereinafter Houck, *Resurrection*]. Houck rests the theory of water quality-based regulation squarely on human use. *Id.* Water quality-based regulation was the original federal water pollution strategy in this country, but faced with "reports of deteriorating water quality from every quarter, the nation was ready for a new strategy of pollution control." *Id.* The new strategy was technology-based, and rested on the premise that water should simply be clean. *Id.*

22. 33 U.S.C. §§ 1311, 1342.

23. Section 402 established the NPDES program to regulate the discharge of pollutants from point sources into waters of the United States. 33 U.S.C. § 1342 (2000).

24. Houck, *The Final Frontier*, *supra* note 14, at 10,483 n.233. The Clean Air Act's toxic emissions program copies the CWA's NPDES program (42 U.S.C. § 7412), as do the Resource Conservation and Recovery Act's "land ban" requirements (42 U.S.C. § 6924). *Id.* The European Union has adopted a water pollution control program modeled on the CWA. *Id.*

25. 33 U.S.C. § 1313(a)-(c).

26. 33 U.S.C. § 1313(c)(2)(A).

27. For a summary of the history of TMDL litigation, see http://www.epa.gov/OWOW/tmdl/lawsuit1.html. *See also* Houck, *Are We There Yet?* *supra* note 11, at 10,392-96. Early citizen's suits focused on EPA's duty to list impaired waterbodies and develop TMDLs when a state fails to do so. In 1996, the focus of TMDL litigation shifted to challenge EPA approval of lists and TMDLs. *See* Idaho Sportsmen's Coalition v. Browner, 951 F. Supp. 962 (W.D. Wash. 1996)

this litigation is that states and industry fought hard to retain an ambient approach in the 1972 amendments that became the Clean Water Act.[28] States argued the continuation of a federal program based on state water quality standards respected state expertise, and state sovereignty.[29] Industry lobbied for water quality standards too, basing its support on the understanding that the standards were minimally enforceable.[30] Congress granted states and industry the approach they requested in Section 303(d). Not surprisingly, few states successfully complied with Section 303(d), with many failing to promulgate even a single TMDL, and EPA did not attempt to enforce the requirement.[31] EPA's neglect arose in part out of the perception, shared by Congress, that nonpoint source pollution constituted a relatively insignificant problem best dealt with by state and local governments. Moreover, EPA was fully occupied with promulgating standards for point sources under the CWA, and with defending them in court.[32] By the 1980s, however, it had become clear that nonpoint source pollution could no longer be ignored, and that EPA would have to take the steps required to implement Section 303(d).[33]

Today, the results of this inaction are glaringly apparent. In the lists of impaired waterbodies submitted to EPA as part of the TMDL program, states identified over 20,000 individual waterbodies that fail to satisfy state water quality standards despite 28 years of pollution control efforts.[34] These impaired waterbodies include roughly 300,000 miles of river and shoreline and five million acres of lakes.[35] In addition, as a result of

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(finding that EPA's approval of Idaho's list of 36 water quality impaired waterbody segments was arbitrary and capricious in light of available information); Sierra Club v. Hankinson, 939 F. Supp. 865 (N.D. Ga. 1996) (holding that EPA's approval of Georgia's two inadequate TMDL submissions was arbitrary and capricious, and its failure to promulgate TMDLs for Georgia violated the CWA).

28. *See* Houck, *Resurrection*, *supra* note 19, at 10,332-35.

29. *Id.* at 10,337.

30. "Industry knew water quality standards did not work, and that is exactly why it wanted them." *Id.*

31. *See* Houck, *Are We There Yet?* *supra* note 11, at 10,392-93. EPA's 1978 regulations "delayed, soft-pedaled, and understated the section 303(d) requirements to a remarkable degree." *Id.* at 10,393. Indeed, EPA saw little reason for implementing the "safety net" of Section 303(d) before technology controls were in place. *Id.* at 10,392.

31. 33 U.S.C. § 1281(c) (2000).

32. Houck, *Are We There Yet?*, *supra* note 11, at 10,392.

33. *Id.*

34. Water Quality Planning and Management Regulation, 65 Fed. Reg. 43,585, 43,587 (July 13, 2000).

35. *Id.*

polluted waterbodies, state and local governments issued 2,506 fish advisories and closed 353 beaches in 1998.[36] EPA's most recent ranking of pollution sources reveals nonpoint pollution as the principal culprit. For example, agricultural runoff is the single largest contributor to the impairment of rivers and lakes,[37] and urban runoff is second only to industrial dischargers in contributing to the degradation of estuaries.[38]

3. *Failure of Voluntary, Planning-Based Efforts*

Until now, the states and EPA have addressed nonpoint pollution through Sections 208[39] and 319[40] of the CWA. These ineffectual provisions have allowed nonpoint source pollution to bloom unhindered while point sources have borne the brunt of the cleanup responsibility. An analysis of the provisions quickly reveals the reasons behind their lack of success.

Section 208 requires states to identify areas with substantial water quality problems and to prepare area-wide waste treatment management plans designed to control or treat "all point and nonpoint sources of pollution."[41] These plans are subject to EPA review and approval, but EPA is not authorized to develop and implement a management plan if a state fails to do so, or if the state plan is inadequate.[42] Similarly, Section 319 requires states to develop new programs on a watershed basis "to the maximum extent practicable."[43] It also requires states to describe a process for identifying "best management practices" and other measures for reducing nonpoint source pollution, and to identify existing state and local programs for reducing nonpoint source pollution.[44] Section 319 does authorize EPA to conduct listing and assessment if a state fails to meet these requirements.[45] However, like Section 208, it contains no express

36. *Id.* at 43,588.
37. *See* Boyd, *supra* note 6, at 4-5.
38. *Id.*
39. *See* 33 U.S.C. § 1288(a) (2000).
40. *See* 33 U.S.C. § 1329(a) (2000). Section 319 requires states to identify waters which cannot reasonably be expected to meet water quality standards because of nonpoint source pollution, and to develop "state management programs" prescribing best management practices to control nonpoint sources. *Id.*
41. 33 U.S.C. § 1281(c).
42. *But see* Robert W. Adler, *Addressing Barriers to Watershed Protection*, 25 ENVTL. L. 973, 1042-44 (1995) (finding that Section 208 is rarely used by states and given little attention by EPA).
43. 33 U.S.C. § 1329(b)(4).
44. *Id.* § 1329(a).
45. *Id.* § 1329(d)(3).

authority for EPA to prepare or implement a nonpoint source pollution control program if a state's program is inadequate or nonexistent.[46]

The ingredients for this recipe for failure include: reliance on state planning to achieve pollution reductions, the lack of any statutory deadlines, an absence of federal authority to force states to adopt pollution control programs, and no requirement for enforceable pollution controls. The deeper reason for the failure of these voluntary, planning-based efforts is that, from the perspective of the communities and governments in a position to prevent it, the water pollution associated with land development and land use activities represents an externality they can choose to ignore.[47] In short, nonpoint sources under the CWA have avoided the features that make the NPDES program successful: national effluent standards, permits with built-in reporting requirements, and multiple opportunities for enforcement.

4. *A New Role for Water Quality Standards*[48]

The distinguishing feature of Section 303(d) is the role played by ambient water quality standards. In contrast to Sections 208 and 319, Section 303(d) includes a built-in measuring stick against which a state's progress in meeting its pollution abatement goals may be evaluated: the water quality standard for the river or stream segment, lake, or estuary for which the TMDL is being developed. Under the CWA, water quality standards contain three elements: (1) use designations for all waterbodies in the state, (2) water quality criteria sufficient to protect those designated uses, and (3) an antidegradation policy.[49] Designated uses are accomplished by assigning segments of water to certain classes and defining the classes by reference to use.[50] For example, Class A waters must

46. *Id.* § 1329(d)(2). Section 1329(d)(2) authorizes EPA to deny grant funding where a state program is inadequate.

47. An externality occurs when a community is able to reap the benefits of encouraging activities that cause nonpoint source pollution which may affect others downstream, without having to pay for the consequences of that pollution.

48. For the theory and practice of water quality standards programs, see RODGERS, *supra* note 2.

49. Under the 1965 Act, a water quality standard consisted of water quality criteria, designated uses, *and* a plan of enforcement. *Id.* at 343. After the initial submission of standards for EPA approval under the 1972 Amendments, Section 303(c) "removed the plan as an element of the water quality standards." *Id.* Thus, at present, the designated uses and the criteria are the gist of the matter. *Id.*

50. *Id.*

be suitable for recreation, and Class B waters must be suitable "for the growth and propagation of fish, other aquatic and semi-aquatic life both marine and freshwater."[51] Water quality criteria may be defined as ambient water standards, or the permissible levels of pollutants allowed in a defined water segment.[52]

Water quality standards, for the most part, are written, enforced, and construed by state authorities.[53] Thus one might expect the standards adopted to vary tremendously across states. In fact, they are surprisingly similar.[54] Professor William Rodgers suggests that "[o]ne reason for their consensus features is that they were justified as study and planning and not as enforcement tools."[55] As enforcement devices, water quality standards have not been very effective, and this is in part attributable to the fact that they were not necessarily designed with enforcement in mind. Instead, water quality standards were intended to provide guidance to agencies responsible for the improvement of water resources. The TMDL program promises both to transform these formerly innocuous standards into enforcement tools and to spark efforts within states to weaken water quality standards.[56]

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51. *Id.* at 344 (citing U.S. EPA Designated Uses—Water Quality Standards Criteria Digest: A Compilation of State/Federal Criteria 21 (1980)).

52. *Id.*

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

54. RODGERS, *supra* note 2, at 347.

55. *Id.*

56. Several commentators suggest that TMDLs offer a tool for implementing an ecosystem approach capable of accounting for diverse pollutant sources and cumulative effects. *See, e.g.*, Michael M. Wenig, *How "Total" are "Total Maximum Daily Loads?" Legal Issues Regarding the Scope of Watershed-Based Pollution Control Under the Clean Water Act*, 12 TUL. ENVTL. L.J. 87 (1998); *see also*, Adler, *supra* note 42, at 977-78 (explaining that a watershed ecosystem approach is part of EPA's overall strategy to achieve sustainable environmental and economic quality). Nonetheless, previous reliance on an ambient approach in water, air, and toxic pollution regulation failed to prove its merit. *See, e.g.*, Houck, *TMDLs III*, *supra* note 9, at 10,415 ("The granddaddy of all approaches to pollution control is the regulation of discharges by ambient standards. The continuing vitality and attraction of this approach could be surprising, given the fact that it has never really worked for water pollution, air pollution, or anything else."). In 1965 Congress passed the Water Quality Act, an ambient-based regulation described as a "[monument] of faith in the commitment of state and local government to secure clean water in the face of powerful local interests; in the ability of science to predict aquatic impacts and to trace observed impacts to their sources; and in the practicality of treating water pollution through comprehensive, regional planning." Houck, *The Final Frontier*, *supra* note 14, at 10,471. *But see* William F. Pederson Jr., *Turning the Tide on Water Quality*, 15 ECOLOGY L.Q. 69 (1988) (advocating a return to a water quality-based focus under the CWA).

B. EPA's New TMDL Regulations

The major work of the new TMDL regulations is to translate ambient water quality standards into source-specific pollution controls, a connection not present in other provisions of the CWA. For example, Section 208 requires states to identify categories of nonpoint source pollution and to develop methods to abate those sources "to the extent feasible,"[57] but does not tie controls to water quality standards. Instead, controls— typically BMPs[58]— are implemented where "feasible," a process that suggests a technology-based approach.[59] In contrast, TMDLs and the pollution abatement measures they require are built from water quality-based pollutant limitations. Although EPA has codified techniques for assuring a connection between water quality standards and source controls,[60] the new final rule still leaves open the question of precisely how this connection will be implemented.

EPA's new final rule cures several fatal deficiencies in the current and largely ignored TMDL regulations. The new rule sets deadlines for state submission of comprehensive lists of polluted waters and, for the first time, requires states to develop an implementation plan for each TMDL that defines the specific steps to be taken to restore those waters.[61] Further, the new rule expands public involvement with required review and comment periods for listed waters as well as specific TMDLs.[62] Finally, the regulations establish schedule requirements for both the development of TMDLs and the attainment of water quality standards.[63]

1. Identification of Impaired Waters: The Listing Process

The first battle in EPA's attempts to breathe life into the TMDL program surrounded the listing process. EPA requested submission of the first comprehensive Section 303(d) lists of

57. 33 U.S.C. § 1288(b)(2).

58. *See* definition *supra* note 15. Examples of BMPs include detention ponds, infiltration swales, restricting land-disturbing activities to particular seasons, and so on.

59. *See* Robert W. Adler, *Integrated Approaches to Water Pollution: Lessons from the Clean Air Act*, 23 HARV. ENVTL. L. REV. 203, 227 (1999).

60. *See* discussion *infra* accompanying notes 94-98.

61. The first round of Section 303(d) lists were submitted in April 1998. Water Quality Planning and Management Regulation, 65 Fed. Reg. 43,585, 43,587 (July 13, 2000).

62. *Id.* at 43,669 (to be codified at C.F.R. pt. 130.36).

63. *Id.* at 43,666-67 (to be codified at C.F.R. pts. 130.28, 130.32(c)).

impaired waterbodies by April 1998.[64] In response, at least one state suggested that it planned to reexamine its use designations as a means of avoiding listing.[65] Section 303(d) requires states to list all waters identified as not meeting water quality standards after application of technology-based controls,[66] but many states have very little information for waters impaired by nonpoint source pollution. Most of the CWA data regarding water quality have been collected in waters polluted by point sources.[67] Even though Section 319 urged states to consider pollution from nonpoint sources, the provision expressly allowed the use of pre-existing information, rather than encouraging new monitoring methods and data collection for nonpoint source pollution.[68] As a result, the scope of listed waters did not reach far.

The new TMDL program, in contrast, ensures that the listing process will capture a greater number of waterbodies. In language similar to Section 319, the TMDL regulations define the minimum data requirements for identifying impaired waterbodies as the use of "existing and readily available water quality-related data and information."[69] The TMDL program encourages expanded data collection, however, by defining "existing and readily available" information to include drinking water assessments and reports of water quality problems from local, state, and federal agencies, tribal governments, members of the public, and academic institutions.[70]

All impaired waterbodies must be listed;[71] however, a TMDL must be established only "for those pollutants which the

64. The lists have now been submitted. *See id.* at 43,616-17. The new regulations require states to submit lists of impaired waters and priority rankings by April 1 of every fourth year, starting in 2002. *See id.* at 43,667 (to be codified at 40 C.F.R. pt. 130.30).

65. That state was Kansas. *See* Houck, *TMDLs III*, *supra* note 9, at 10,435.

66. *See* 33 U.S.C. § 1313(d)(1)(A).

67. *See* Adler, *supra* note 59, at 295 n.88 (noting the lack of existing EPA guidance on monitoring and reporting systems).

68. *See* 33 U.S.C. § 1319(a)(2) (2000).

69. Water Quality Planning and Management Regulation, 65 Fed. Reg. at 43,664. States must use "existing and readily available water quality-related data and information." Existing and readily available data and information includes at a minimum the state's most recent Section 305(b) report and EPA approved Section 303(d) list, Section 319 source assessments, drinking water source assessments, dilution calculations, trend analyses, or predictive models for determining the physical, chemical, or biological integrity of waterbodies, and data and information from local, state, territorial or federal agencies, tribal governments, members of the public, and academic institutions. *See* 40 C.F.R. § 130.22(b)(1)-(6).

70. *See* 40 C.F.R. § 130.22(b)(1)-(6).

71. The scope of the listing requirement under Section 303(d) is broader than the requirement that states establish TMDLs. In fact, the listing requirement arguably

Administrator identifies . . . as suitable for such calculation,"[72] and for thermal discharges.[73] The regulations break the listing requirement into four parts, each fulfilling a different function. Part 1 lists waterbodies impaired by one or more pollutant(s) and requiring TMDLs.[74] Part 2 introduces a distinction between waters impaired by pollutants, and those impaired by pollution, so that waters impaired by pollution alone are listed but do not require TMDLs.[75] Part 3 requires listing of waterbodies for which an approved or established TMDL exists, but for which water quality standards have not yet been attained.[76] Part 4 grants an exception to states with programs already in place to curb pollution.[77] A state is not required to develop a TMDL where it can demonstrate that water quality standards will be attained by the date of submission of the next list.[78] A state can make this showing where it has implemented technology-based controls or

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covers *all* waters within a state's boundaries. Under Section 303(d)(3), the Act requires states to identify all remaining waters "[f]or the specific purpose of developing information." 33 U.S.C. § 1313(d)(3). This listing process arguably entails a separate process and is not limited to impaired waters. The waters listed under this provision also require an estimate of "total maximum daily load with seasonal variations and margins of safety." *Id.* Interestingly, not only is the purpose spelled out for this listing exercise, so is the standard for setting TMDLs: "at a level that would assure protection and propagation of a balanced indigenous population of fish, shellfish, and wildlife." *Id.* Because this list is for informational purposes only, EPA does not require that it be submitted for review. *See* 40 C.F.R. § 130.7(e) (1997).

72. *See* 33 U.S.C. § 1313(d)(1)(C), (d)(3). EPA has listed pollutants suitable for TMDL calculations at 33 U.S.C. § 1314(a)(2) (2000).

73. *Id.* at § 1313(d)(1)(D), (d)(3). Section 303(d) also covers pollution caused by thermal discharges. The standard is set in the statute in Section 303(d)(1)(B) as the protection and propagation of shellfish, fish, and wildlife, in contrast to TMDLs, where designated use is part of the water quality standard developed by the state. This Note does not discuss the standards for thermal discharges.

74. 40 C.F.R. § 130.27(a)(1). When listing impaired waterbodies for TMDL development, a state may indicate a stream segment or an entire basin. The geographic scope of the listed waterbody drives the scope of the implementation plan. The area must be large enough to account for all the sources contributing to the impairment, but not so large as to be unmanageable.

75. 40 C.F.R. § 130.27(a)(2). Section 303(d)(1)(A) of the CWA has been interpreted by the EPA as requiring listing of impaired waters, whether the impairment is caused by pollutants or pollution. EPA reads Section 303(d)(1)(A) to include waters not meeting water quality standards in spite of required effluent limitations, due to pollution, and where there is no pollutant causing or contributing to the impairment. *See* Water Quality Planning and Management Regulation, 65 Fed. Reg. 43,585, 43,610 (July 13, 2000). Pollution is defined as the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water. *See* 33 U.S.C. § 1362(19).

76. Water Quality Planning and Management Regulation, 65 Fed. Reg. at 43,665.

77. *See* 40 C.F.R. § 130.27(a)(4).

78. *Id.*

other controls enforceable by state or federal law.[79] Waterbodies with implemented, enforceable controls are placed on Part 4 of the list and do not require a TMDL, even though they do not currently meet water quality standards.

State efforts in this area will be subject to public scrutiny. The listing process is designed to serve the role of identifier both for the governing agencies and the public. EPA views the Section 303(d) list "as a comprehensive public accounting of all [waterbodies] impaired or threatened by pollution and pollutants, irrespective of the tool or mechanism being used to achieve standards." To this "public accounting" end, the impaired waters list must be made available to the public no less than 30 days prior to submission to EPA.[80] In addition, the methodology a state develops for considering and evaluating water quality data and information must be made available to the public in draft form for review and comment.[81]

2. *Plans for Cleaning Up the Nation's Water*

EPA's regulations describe a TMDL as a written, quantitative plan and analysis for attaining and maintaining water quality standards in all seasons for a specific waterbody and pollutant.[82] The TMDL must identify the pollutant for which the TMDL is being written, including natural "background" sources.[83] The next step is to allocate responsibility for pollutant load reductions among the identified sources in order to attain the water quality standard. As noted above, under the new program states enjoy complete discretion in this arena.[84] Permitted point

79. *Id.*

80. *See id.* § 130.36(a).

81. *See id.* § 130.23(a). The public shall have the opportunity to submit comments for no less than 60 days, and the state must provide a summary of all comments received and a response to the significant comments when the final methodology is submitted to EPA. *See id.*

82. *See id.* § 130.32(a).

83. *See id.* § 130.32(b).

84. A potential consequence of state control is the transformation of conflicts over who is to shoulder load allocations into an argument over relative economic values. *See* Boyd, *supra* note 6, at 6. Not only do states have the discretion to assign reductions based on economic as well as environmental factors, whole categories of sources may be exempted from the program. For example, Florida recently enacted a TMDL implementation statute that specifically excludes agricultural nonpoint source pollution from load allocations. J. B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 ECOLOGY L.Q. 263, 304 (2000). James Boyd suggests that the need to meet water quality standards "sets up a state-by-state confrontation between well-organized industrial interests— who can claim to have already paid their pollution control dues— and organized agricultural, silvicultural, and municipal

sources are allocated wasteload reductions;[85] nonpoint sources are allocated load reductions.[86] Wasteload allocations are enforced through numeric effluent limitations contained in NPDES permits.[87] Load allocations for nonpoint sources, on the other hand, are not backed by a clear requirement for enforceable or mandatory controls and depend entirely on state enforcement programs.[88] Although EPA is authorized to develop and promulgate a TMDL when a state fails to do so, it has no statutory authority to enforce the nonpoint controls contained in a TMDL.

One of the most controversial elements of the new regulations is the requirement that states submit an implementation plan as one of the minimum elements of a TMDL.[89] These plans include such practical details as the identification of wasteload and load allocations, intended control actions, a timeline, and TMDL revision procedures.[90] Stakeholders naturally resisted this requirement, arguing that EPA lacks authority to order an implementation plan as a mandatory component of a TMDL.[91] EPA stood its ground, however, describing such plans as one of the most important aspects of the new regulations.[92] EPA believes the new plan requirement enables it to determine whether a TMDL has been approved at a level necessary to implement water quality standards, as required by Section 303(d).[93]

The new regulations seek to solidify the link between the load allocations of a TMDL and the anticipated attainment of water quality standards within the implementation plan. This link is given form in the requirement that states provide

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interests who resist the 'expansion' of CWA-driven requirements to their hard-to-solve nonpoint problems." Boyd, *supra* note 6, at 6; *see also* Caputo, *supra* note 17, at 10,582 (predicting that point sources will likely push for legislative reform to force nonpoint sources to bear more of the burden of pollution reductions necessary to meet applicable TMDLs).

85. Wasteloads are assigned to point sources permitted under Section 402 of the Act. *See* 40 C.F.R. § 130.32(b)(6) (2000).

86. *See id.* § 130.32(b)(7). EPA concedes the difficulties associated with quantifying loadings from nonpoint sources by allowing quantification on an aggregate basis. Water Quality Planning and Management Regulation, 65 Fed. Reg. 43,585, 43,623 (July 13, 2000).

87. *See* Adler, *supra*, note 59, at 230.

88. *See id.*

89. *See* 40 C.F.R. § 130.32(c).

90. *Id.*

91. *See* Water Quality Planning and Management Regulation, 65 Fed. Reg. at 43,625.

92. *Id.*

93. *See id.*

"reasonable assurance" that they will fulfill the TMDL implementation plan. Reasonable assurance is defined in the new final rule as a "demonstration that TMDLs will be implemented through regulatory or voluntary actions, including management measures or other controls, by Federal, State or local governments, authorized Tribes, or individuals."[94]

In the context of point sources, reasonable assurance means that states must identify procedures that will ensure the modification, issuance, or reissuance of permits as "expeditiously as practicable" to incorporate effluent limitations that are consistent with wasteloads allocated under a TMDL.[95] Thus, consistency with NPDES permits is considered a valid assurance for point sources. In contrast, satisfying the reasonable assurance requirement for nonpoint sources is much less simple and direct. States must demonstrate that the "management measures or other control actions" specified in the implementation plan for nonpoint sources meet a four-part test.[96] The control actions or management measures must have a documented connection to reducing flows of the pollutant into the waterbody, be implemented as expeditiously as practicable, have the programmatic and administrative means for implementation and monitoring, and be supported by adequate water quality funding.[97] Furthermore, not only is compliance with the requirement more complex for nonpoint sources, but EPA also lacks authority to require measures equivalent to the federal enforcement mechanism of an NPDES permit. Thus, as long as they meet the four-part test, voluntary and incentive-based actions or existing programs are acceptable means of demonstrating reasonable assurance.[98]

Despite the challenges of ensuring the implementation of nonpoint source control measures, EPA's new regulations reveal that Section 303(d) is not without "teeth." First, states are held to a schedule for submitting TMDLs to EPA for review and

94. 40 C.F.R. § 130.2(p). EPA asserts its authority for requiring reasonable assurance under the Section 303(d) general requirement that TMDLs achieve water quality standards and CWA Section 501(a) authorizing EPA to adopt regulations as necessary to implement the CWA. *See* Water Quality Planning and Management Regulation, 65 Fed. Reg. at 43,598.

95. 40 C.F.R. § 130.2(p)(1).

96. *Id.* § 130.2(p)(2).

97. *See* 40 C.F.R. §§ 130.32(a)(11), 130.32(c)(2)(ii), 130.2(p); *see also* Water Quality Planning and Management Regulation, 65 Fed. Reg. at 43,599.

98. *See* 40 C.F.R. § 130.2(p)(2)(ii).

approval.[99] Second, EPA codified its authority to establish TMDLs if it determines a state has not or is not likely to meet its schedule, consistent with several court decisions finding a duty in the Agency to establish TMDLs where a state has failed to do so.[100] The trigger initiating EPA takeover of TMDL establishment is a state's failure to demonstrate "substantial progress."[101] If a state fails to develop a TMDL within schedule, EPA must act to ensure the TMDL is established within two years.[102]

Despite the regulations' increased rigor, however, EPA can do nothing to bridge the crucial gap in the statute; the Agency lacks the authority to directly enforce the nonpoint source controls required by a TMDL.[103] While it is true that EPA wields substitution power, to step in and establish a TMDL without the ability to enforce its requirements may simply not be enough. Section 303(d) constrains EPA to a jurisdictional balancing between allowing states flexibility in implementing TMDLs and providing the "stick" that is clearly necessary to get them moving on cleaning up nonpoint sources. The stick in this case is limited to deadlines, substitution authority, and the pressure provided by an expanded and codified role for the public.[104]

II
ANALYSIS

Nonpoint source pollution threatens to erase many of the gains achieved by the CWA in improving and restoring the nation's water resources. The success of any effort to tackle this problem depends on tailoring an abatement program to meet its distinctive political and practical challenges. First among these

99. *See id.* § 130.28. States must submit TMDLs "as expeditiously as possible," but no later than 10 years from July 10, 2000. *Id.* § 130.28(b)(2). A state may extend the schedule for submission of one or more TMDLs by no more than 5 years, if the state can demonstrate that establishing all TMDLs is not practicable. *See id.* This schedule has not pleased environmentalists, but EPA may be showing both wisdom and generosity in giving the states time to tackle a task that is nothing short of daunting. The scientific, technical, and administrative challenges of implementing TMDLs are significant and will strain the resources of many state agencies.

100. *See, e.g.*, Scott v. City of Hammond, 741 F.2d 992 (7th Cir. 1984); Alaska Ctr. for Env't v. Browner, 20 F.3d 981 (9th Cir. 1994).

101. Water Quality Planning and Management Regulation, 65 Fed. Reg. at 43,669.

102. When the EPA develops a TMDL, the regulations allow the Agency two years for publication of the TMDL. The Administrator may extend the period an additional two years where there is a "compelling need" for more time. *See* 40 C.F.R. § 130.35(a)(2). In that event, the Administrator must publish its decision to extend the TMDL development period in the Federal Register. *Id.*

103. *See* 33 U.S.C. §§ 1342(b)-(c), (d), 1329.

104. *See supra* text accompanying notes 80-81.

challenges is the very nature of nonpoint source pollution. Diffuse activities cause nonpoint pollution by altering the natural runoff and infiltration properties of the land.[105] Complicating matters further, these activities frequently are not closely related in time to their effects on the resource. In addition, effective management of nonpoint source pollution demands a shift in regulatory emphasis from impersonal industrial polluters to individuals and communities, and to land uses such as farming that have historically enjoyed an unregulated status.

Attempts to implement the new TMDL program will certainly raise public awareness of the ubiquitous character of nonpoint source pollution. Heightened public awareness alone, however, cannot justify and sustain the TMDL program; it must actually reduce the flow of pollutants into lakes, rivers, streams and estuaries. TMDLs provide a critical baseline for evaluating a state's progress toward attaining water quality goals. They do not, however, provide the type of clear, consistent, enforceable standards embodied in the NPDES program. In short, the TMDL program is burdened with all of the problems inherent in any ambient-based regulatory system, with a few extra challenges tossed in for good measure. The most significant of these hurdles results from the mischaracterization of major point source polluters as nonpoint sources, which forces EPA to apply the cumbersome TMDL program to sources better suited to regulation under the CWA's highly effective NPDES program.

A. *Overcoming the Point/Nonpoint Distinction*

Significant gains in restoring the nation's water resources could be achieved through a proper characterization of point and nonpoint sources. The CWA's distinction is a mix of myth and fact, fostered by the high stakes historically associated with classification as a nonpoint source: no regulation. Yet, if the statutory definition of a point source as a "discernible, confined and discrete conveyance" can be understood as a method for singling out those activities suitable for control at the source, there are a number of currently unregulated dischargers that fit the bill.[106] These "nonpoint" sources should be captured in the ambit of the NPDES program, rather than in nebulous and unenforceable nonpoint source state implementation plans.

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105. *See generally* THOMAS DUNNE & LUNA B. LEOPOLD, WATER IN ENVIRONMENTAL PLANNING 255-78 (1978).

106. *See* RODGERS, *supra* note 2, at 307.

The TMDL program tends to reinforce the public perception that a line exists between pollution resulting from many small, diverse sources that are not susceptible to simple technological fixes, and pollution flowing out of pipes. Meanwhile, major industries, including agribusiness, forestry operations, and multinational mining companies, continue to avoid the CWA's most effective pollution control mechanism, not because technological controls are impractical or infeasible, but because they remain politically unpalatable.[107]

The existing exemption granted irrigation return flow is illustrative.[108] Congress specifically exempted polluted agricultural discharges and runoff that the NPDES program could have addressed, based on the belief that the adverse effects on water quality from these sources was minimal and properly within the regulatory domain of state and local agencies.[109] As a result, irrigation return flow is defined as a nonpoint source under the statute, even though it enters surface water through pipes and ditches and represents a significant source of water quality impairment.[110]

While the remedy for this particular obstacle to restoring water quality is legislative, EPA missed an opportunity to capture other significant pollutant sources in the NPDES program that are not statutorily exempt. In its proposed regulations, EPA expanded the definition of point source to encompass certain silvicultural activities, animal feeding

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107. *See, e.g.*, Houck, *The Final Frontier*, *supra* note 14, at 10,483.

108. The CWA as originally enacted would have encompassed the collected return flow from irrigated agriculture under the NPDES program, but Congress closed that avenue by amending the Act in 1977 to exclude irrigated agriculture from point source regulation. *See* Pub. L. No. 95-217 § 33(b), 91 Stat. 1566, 1577 (1977). For a discussion of the struggle between EPA, courts, and Congress over this issue, see Ruhl, *supra* note 84, at 294-95. In 1987, Congress excluded all agricultural stormwater discharges from the definition of "point source," so that runoff collected in ditches, canals, and other conveyances are beyond the reach of the NPDES program. *Id.* at 296.

109. *See* Ruhl, *supra* note 84, at 296 n.194.

110. *See, e.g.*, *id.*; John H. Davidson, *Commentary: Using Special Water Districts to Control Nonpoint Sources of Water Pollution*, 65 CHI.-KENT L. REV. 503 (1989). Davidson notes that over one-half of all water in the western U.S. is controlled by special water districts. *See id.* at 505. These water districts assume many forms, but all are political subdivisions of state government. *See id.* According to Davidson, special water districts are well situated to address water quality issues; they are typically organized by watersheds, and have the capacity to bring economies of scale to pollution control and to mitigate the effect of the argument that farmers are "price-takers" in the marketplace, and are therefore unable to pass the cost of pollution control on to consumers. *Id.* at 515-17.

operations, and aquatic animal production facilities.[111] This expansion would have enabled the Agency to apply CWA's powerful permit-driven mode of regulation to discharges with major impacts on water resources. In the period between the date the proposed rules were issued and the final rule was promulgated, however, EPA withdrew its proposal under heavy fire from industry and the U.S. Department of Agriculture.[112] When states begin to realize the full cost of the water quality-based alternative to technology-based standards, they may wish EPA had ushered unregulated point sources into the NPDES fold.[113]

B. *The Inherent Limitations of an Ambient Approach*

TMDLs are poised to become the central feature in a comprehensive federal program addressing nonpoint pollution.[114] Yet the TMDL program is burdened by a fundamental structural flaw characteristic of ambient approaches to pollution abatement. It must trace backwards from effect to cause under circumstances where the contributions to the impairment of a waterbody are rarely known with certainty and can be exceedingly hard to derive. The workhorses of an ambient approach are monitoring and modeling. Under the TMDL program, monitoring drives the listing of impaired waterbodies, measures the attainment of water quality standards, and detects violations of water quality standards. The scope of the monitoring requirement under Section 303(d) is enormous. Millions of waterbody segments in the country will potentially require monitoring for a range of pollutants.

In some instances, monitoring leads directly to an evaluation of source contributions.[115] More typically, however, source

111. *See* Water Quality Planning and Management Regulation, 65 Fed. Reg. 43,585, 43,648-52 (July 13, 2000).

112. Houck suggests the Agency may have balked based on its experience trying to regulate highly polluting CAFOs. *See* Houck *The Final Frontier*, *supra* note 14, at 10,482.

113. *See* Houck, *Are We There Yet?*, *supra* note 11, at 10,401. Houck suggests that once the difficulty and cost of TMDLs sink in, coupled with the uncertainty of achieving load reductions at the end of it all, "technology standards may begin to look like quite a bargain." *Id.*

114. *See, e.g.*, Caputo, *supra* note 17, at 10,582 (explaining that TMDLs are a "crucial mechanism" for achieving ambient water quality goals); Houck, *The Final Frontier*, *supra* note 14, at 10,485 (stating that TMDLs are the best prospect for "coming to grips" with the nation's last major unregulated sources of pollution).

115. For example, stormwater discharges may be monitored for lead in order to gauge the amount of lead contributed by runoff from an urban area. *See* Boyd, *supra* note 6, at 12.

contributions must be evaluated indirectly through models. Modeling pollutant pathways is a resource-intensive exercise that demands an understanding of weather events, temperature, hydrology, geomorphology, and vegetative cover, as well as other landscape characteristics relevant to the area for which the TMDL is being developed.[116] In addition, it is difficult to economize by developing models of general applicability in the water pollution context because of the variation in these characteristics across different watersheds in different regions of the country. According to a recent General Accounting Office study, current EPA watershed models, costing $25,000 per study, are insufficient to calculate the effects of pollutant loadings and the costs of their controls.[117] Potentially more accurate models are available from the U.S. Geological Survey at a cost of $750,000 each.[118]

Monitoring techniques are much improved and models are more sophisticated than they were 30 years ago. Nevertheless, an enforcement context inevitably magnifies the problems associated with these tools.[119] Moreover, any time a process involves a high degree of uncertainty, a cascade of other issues follow that can undermine both the goals of the program, and its legitimacy over the long haul. The Clean Air Act (CAA) has been struggling with the problems associated with ambient-based regulation for years, prompting an observation that could presage the outcome of the TMDL program: "[t]he [CAA's] process is extremely complex, creating high transaction costs for governments and businesses. The Act's enforcement also requires more data about pollution effects and controls than science can provide, thereby allowing manipulation that undercuts achievement of the Act's ultimate goals, wastes resources, and creates inequities."[120]

116. For an in-depth discussion of runoff processes, see DUNNE & LEOPOLD, *supra* note 105, at 255-78.

117. *See* Houck, *The Final Frontier*, *supra* note 14, at 10,477.

118. *Id.*

119. Stakeholders have already exploited weaknesses in monitoring and assessment by pressuring states to reduce their Section 303(d) lists of impaired waters to the absolutely proven. *See id.*

120. David Schoenbrod, *Goals Statutes or Rules Statutes: The Case of the Clean Air Act*, 30 UCLA L. REV. 740, 743 (1983).

C. *Lessons from the Clean Air Act*[121]

The CWA contains provisions covering a spectrum of federalism models. At one end is Section 319, which delegates nearly all regulatory authority to the states and results in little or no pollution reduction. The NPDES program stands at the other end. States are responsible for the bulk of NPDES implementation, but state discretion is constrained by national technology-based standards, strong EPA oversight, and the program's framework of mandatory and enforceable federal requirements.[122] The TMDL program's distribution of authority falls somewhere in between these two models of federalism. States, rather than the federal government, develop the standards underpinning the program. In addition, states have the authority to implement and enforce TMDLs. EPA oversees TMDL development and may disapprove a state TMDL and substitute its own, but it lacks the authority to enforce nonpoint source pollution controls directly.[123]

In these respects, TMDLs resemble the CAA's State Implementation Plans (SIPs).[124] Both programs confer substantial responsibility on states to devise and implement pollution controls according to local economic and environmental conditions, within parameters set by the applicable air or water quality standards.[125] EPA is authorized to disapprove a state's SIP if it finds the state has not provided assurance that adequate funding and authority exist to carry out the SIP's implementation plan.[126] The TMDL program mirrors this approach in its "reasonable assurance" requirement for load allocations.[127] Under both programs, EPA may exercise substitution authority where a state fails to meet its statutory

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121. Subsection title borrowed from Robert W. Adler's article, *Integrated Approaches to Water Pollution: Lessons from the Clean Air Act*, *supra* note 59.

122. *See* Caputo, *supra* note 17, at 10,581-82.

123. Unlike the NPDES program, Section 303(d) does not afford multiple opportunities for enforcement. For example, the CWA's citizen suit provision does not cover Section 303(d). *See generally*, Michael P. Healy, *Still Dirty After Twenty Five Years: Water Quality Standard Enforcement and the Availability of Citizen Suits*, 24 ECOLOGY L.Q. 393 (1997).

124. *See* Adler, *supra* note 59, at 206.

125. Note that air quality standards are published by EPA, not by individual states. EPA has published "National Ambient Air Quality Standards (NAAQS) for six pollutants only, thus the scope of SIPs is limited. The scope of pollutants for which TMDLs may be developed is much broader.

126. *See* 42 U.S.C. § 7410(a)(2)(F) (2000).

127. 40 C.F.R. 130.32(c)(2)(ii).

and regulatory obligations, but in neither can it exert direct enforcement authority.

The two programs, however, differ significantly with respect to standards. EPA promulgates National Ambient Air Quality Standards (NAAQS), whereas individual states establish water quality standards. NAAQS exist for only six pollutants; water quality standards exist for many more. States and EPA have a consistent national baseline for the evaluation of SIPs. In contrast, the baseline for TMDLs will vary depending on the physical characteristics of the waterbody and the quality of the data that informed development of the applicable water quality standard. State control over water quality standards serves a practical purpose, because states are in a better position to deal with local conditions and account for the tremendous variation in watersheds. At the same time, state control is a potential weakness that permits manipulation of standards in order to avoid or delay regulating polluters. Thus, differences in standards suggest that the problems encountered in the CAA's SIP process may be amplified in the context of the CWA.

The history of the SIP process offers hard lessons for future efforts to implement TMDLs.[128] The limitations of an approach dependent on measures of ambient environmental quality quickly emerged in a phenomenon called "gaming."[129] SIPs rely heavily on models for predicting attainment of NAAQS. Models are built on data and assumptions (more of the latter where the former are lacking). States "game" by choosing favorable assumptions and inputs to arrive at the results they want.[130] Other program flaws include ambiguous institutional responsibilities, a degree of complexity that makes it difficult to identify what requirements apply, uncertainty about the future effectiveness of diverse control measures, and high decisionmaking costs.[131] Former EPA administrator Douglas Costle described the SIP process as "so cumbersome and

128. *See* Adler, *supra* note 59, at 208 ("[T]he TMDL program is certain to fail if its implementers do not learn from the checkered history of the SIP process.").

129. *See id.* at 240.

130. Former EPA Administrator Douglas Costle stated: "Modeling is becoming elevated to the same high art of gamesmanship as lawyering, and often a company finds it cheaper to hire modelers and lawyers than to put in pollution control equipment." Schoenbrod, *supra* note 120, at 773. Even where states do not "game," models of air quality rarely offer precise answers. *See, e.g.*, David M. Driesen, *Five Lessons from the Clean Air Act Implementation*, 14 PACE ENVTL. L. REV. 51, 56 (1996).

131. *See* Howard Latin, *Regulatory Failure, Administrative Incentives, and the New Clean Air Act*, 21 ENVTL. LAW. 1647, 1689, 1692-94 (1991).

problematical that it almost literally forces us to focus on the trees instead of the forest."[132]

Perhaps the most telling lesson for efforts to implement TMDLs is the fact that the CAA has not yet successfully addressed pollution from diffuse sources.[133] The CAA has reduced pollution from automobiles where an end-of-pipe control strategy is available: national standards for tailpipe emissions that can be enforced directly against manufacturers. Efforts to achieve mobile source reductions through land use strategies, however, have failed.[134] This failure is attributable in part to the model of federalism imposed by the CAA. Although this model is well suited to stationary sources, conflicts with the established allocation of responsibility for local land use regulation appear to render it ineffective in the context of diffuse and mobile sources. Given the similarity between the SIP and TMDL programs, this history calls into serious question the ability of the new regulations to deal effectively with the current water quality problems caused by diffuse nonpoint sources.[135]

D. *Land Use as a Source of Air and Water Pollution Problems*

The prevention and control of nonpoint pollution depends on creative land use strategies. To date, EPA's efforts to promote changes in land use planning remain singularly unsuccessful. Land use is the traditional domain of state and local governments and experience illustrates that it is both difficult and politically risky to direct local decisions from the national level.[136]

In the 1970s, EPA plunged into the land use and transportation arena by attempting to regulate "indirect sources" of air pollution. The indirect source review component of a SIP involves land use and transportation planning strategies to reduce vehicle miles traveled (VMTs) and thereby improve air quality.[137] EPA undertook indirect source review because it determined that emissions controls on stationary sources and the tailpipes of automobiles would be inadequate to attain and

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132. Schoenbrod, *supra* note 120, at 749-50.

133. *See* Adler, *supra* note 59, at 245-49.

134. *See id.* at 260-62.

135. Patrick Del Duca & Daniel Mansueto, *Indirect Source Controls: An Intersection of Air Quality Management and Land Use Regulation*, 24 LOY. L.A. L. REV. 1131, 1143 (1991).

136. *See id.* at 1148.

137. *See* Adler, *supra* note 59, at 245-46.

maintain NAAQS.[138] As a first step, it issued indirect source review guidelines requiring states to incorporate air quality considerations into local land use decisions.[139] When states ignored these guidelines, EPA issued regulations shifting authority for implementation of indirect source reviews to itself.[140]

States resisted EPA's efforts to implement indirect source reviews and other land use controls, challenging the Agency on both statutory and constitutional grounds.[141] In the end, EPA never implemented the regulations.[142] In fact, Congress responded to the furor by withdrawing EPA's authority to require inadequate indirect source review provisions as a condition of SIP approval.[143] Moreover, in the 1990 CAA amendments, Congress further diluted EPA's authority to address traffic-related pollution by providing that the Act does not infringe on "the existing authority of counties and cities to plan or control land use."[144]

A similar pattern is evolving in efforts to implement the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), aimed at controlling nonpoint source pollution in coastal areas.[145] CZARA mimics the approach of the CWA. First, technology-based controls are implemented and then TMDLs are applied to clean up what remains.[146] CZARA goes farther, however, by requiring *enforceable* mechanisms to implement measures to control nonpoint pollution.[147] If such mechanisms are not adopted, the state loses eligibility for grant funding under both the Coastal Zone Management Act and Section 319 of the CWA.[148] Faced with the prospect of real federal control, states are pressing EPA and NOAA to relax their view of the "enforceability" of state coastal programs and to accept existing state authority

138. *See* Del Duca & Mansueto, *supra* note 135, at 1149.
139. *Id.*
140. *See id.* at 1152-53.
141. Adler, *supra* note 59, at 247.
142. *See* Del Duca & Mansueto, *supra* note 135, at 1154. EPA gave three reasons for the regulations' failure: (1) political opposition; (2) the EPA lacked resources to implement the regulations; and (3) the EPA failed to offer technical resources to the states to carry out the regulations. *See id.*
143. *See* Adler, *supra* note 59, at 247-48.
144. 42 U.S.C. § 7431 (2000).
145. 16 U.S.C. §§ 1451-1465.
146. 16 U.S.C. § 1455(g).
147. *See* Houck, *TMDLs III*, *supra* note 9, at 10,424.
148. 16 U.S.C. § 1455(c)(3).

as sufficient.[149] According to one observer, the process is turning CZARA into a "reenactment of CWA Section 319."[150]

The TMDL regulations avoid any attempt to require states to adopt land use controls to prevent nonpoint pollution, even though the effective prevention of nonpoint pollution demands a land use approach. As noted above, EPA lacks authority under the CWA to implement nonpoint source controls. Nevertheless, many observers clearly hope the TMDL program will induce states to adopt changes in land use to improve water quality. The experiences highlighted above suggest that both strong federal support and enforceable standards are a prerequisite for states to override local objections to mandatory land use and planning programs.

EPA's ability to ensure the implementation of nonpoint controls is limited to the requirement that a TMDL's implementation plan include "reasonable assurance" that load allocations will be met.[151] Consequently, nonpoint controls are only enforceable to the extent they are made so by state law. This is not particularly reassuring given the poor record of most states in addressing nonpoint source pollution.[152] The absence of state law, however, is not necessarily the cause of this failure— a long list of state laws exist that could be marshaled to compel nonpoint controls.[153] More often, the failure to address nonpoint source pollution results from a lack of political will to enforce existing laws against local industries without the back-up threat of federal enforcement.[154]

If states are to comply with the TMDL program, they may have no choice but to tackle the issue of land use, particularly

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149. *See* Houck, *TMDLs III*, *supra* note 9, at 10,424.

150. *Id.*

151. EPA has attempted to make the reasonable assurance requirement as rigorous as possible. Voluntary and incentive-based actions, or existing programs are acceptable means of demonstrating reasonable assurance but they must meet EPA's four-part test set out in 40 C.F.R. § 130.2(p)(2). They must apply specifically to the pollutant for which the TMDL is being developed, be implemented as expeditiously as practicable, be accompanied by a reliable delivery mechanism, and support on adequate findings. *Id.*

152. This failure is due in part to the exemptions granted particular nonpoint sources. Agriculture is the most obvious example. *See* Ruhl, *supra* note 84.

153. *See generally* James M. McElfish, Jr., *State Enforcement Authorities for Polluted Runoff*, 28 ENVTL. L. REP. 10,181 (1998). According to McElfish, enforcement mechanisms vary significantly from state to state, and from watershed to watershed. Examples include provisions found in fish and game laws, forestry practices laws, and sedimentation and erosion laws. *Id.*

154. *See, e.g.*, Houck, *The Final Frontier*, *supra* note 14, at 10,480. By way of example, Houck explains, "[n]o state employee in his or her right mind would volunteer to take on the sugar industry." *Id.*

where water impairment is caused solely by nonpoint sources or where point source controls have met their cost-effective limit.[155] Land use controls are the only strategy that can *prevent* nonpoint pollution. Zoning ordinances and comprehensive plans guide development and can reduce pollution merely by siting uses thoughtfully.[156]

In the interim, the most immediately accessible technique available to states for addressing nonpoint pollution is the implementation of BMPs.[157] A BMP is a control measure— such as buffer strip planting— aimed at slowing, retaining, or absorbing pollutants carried in surface water runoff. Most existing nonpoint source control programs rely on BMPs to reduce polluted runoff, and BMPs are explicitly incorporated into the CWA's approach to nonpoint pollution in Sections 208 and 319. Section 208 asks states to describe BMPs in their water quality plans. Section 319 requires states to identify and implement[158] "best management practices and measures" to reduce pollution from nonpoint sources.[159] In addition, EPA provides technical descriptions of BMPs for a variety of nonpoint source categories.[160]

Implicit in the use of BMPs is the recognition that nonpoint controls must often be adapted to local conditions. BMPs are flexible and their technology is relatively well-advanced.[161] On the other hand, they potentially can aggravate other water quality problems. For example, BMPs that remedy surface water runoff problems may impair groundwater by altering groundwater recharge.[162] In terms of providing enforceable legal standards,

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155. If states do decide to tackle land use, they may find the CAA and CWA model of federalism useful. The state could set goals and assign responsibility for meeting those goals. Local governments would be responsible for meeting those goals through land use regulation, backed by the threat of state substitution where local government fails to act. For a discussion of the 1989 Air Quality Management Plan for California's South Coast Air Basin, see Del Duca & Mansueto, *supra* note 135.

156. Examples include protecting large riparian buffer zones and clustering residential development to maximize vegetative cover and undisturbed soil area.

157. James Boyd describes BMPs as "the nonpoint analog to end-of-pipe controls on point sources." Boyd, *supra* note 6, at 22.

158. *See* 33 U.S.C. § 1329(b)(2)(B).

159. *Id.* § 1329(b)(2)(A).

160. *See* 40 C.F.R. § 130.6(c)(4)(iii)(A)-(G) (2001).

161. *See generally*, Mandelker, *supra* note 15; Richard Whitman, *Clean Water or Multiple Use? Best Management Practices for Water Quality Control in the National Forests*, 16 ECOLOGY L.Q. 909 (1989).

162. *See* Mandelker, *supra* note 15, at 485; *see, e.g.*, Bruce K. Ferguson, *The Failure of Detention and the Future of Stormwater Design*, LANDSCAPE ARCHITECTURE 76 (1992) (finding that uniform on-site detention fails to reduce flooding or improve water quality).

BMPs are in their infancy. In some states they are enforceable, in others they are merely a voluntary activity.[163] Where BMPs are directly enforceable, the courts are becoming increasingly familiar with their importance.[164] Several recent cases suggest courts will examine BMPs to determine compliance with land management requirements.[165] In the end, however, it is unclear that the use of BMPs will be enough either to comply with the new TMDL regulations or to stave off the burgeoning nonpoint pollution problem. There are tough choices ahead for the state agencies that regulate water quality.

CONCLUSION

The practical difficulties presented by nonpoint source pollution and the inherent limitations of the TMDL program suggest its rate of accomplishment will vary according to the resources and political will of the individual states. In general, the success of the TMDL program in achieving comprehensive pollution reductions will likely be much more limited than that achieved by the NPDES program. TMDLs could be described as having the command, but lacking the control necessary to be truly effective. They provide a much-needed baseline for pollution control efforts and hold states to the water quality standards they themselves developed. Nevertheless, TMDLs lack the rigor, specificity, and multiple opportunities for enforcement that make the CWA's point source program powerful.

Overcoming nonpoint source pollution is a political project. It requires reaching out to historically unregulated actors, and into the traditional domain of local governments. Curbing nonpoint source pollution demands a flexible approach adaptable to local conditions— but not compromised by that adaptability— as well as a commitment to funding incentive programs that will encourage the implementation of effective controls.[166] TMDLs offer an important learning opportunity; nonpoint source pollution is a type of environmental problem that resists the narrow focus of traditional regulatory approaches to environmental degradation. With perseverance,

163. *See* Boyd, *supra* note 6, at 22-23.

164. *See id.*

165. *See id.*

166. For suggested alternative approaches to reducing nonpoint source pollution, including tax incentives and restrictions on farming applications, *see, e.g.*, Ruhl, *supra* note 84; David Zaring, *Agriculture, Nonpoint Source Pollution, and Regulatory Control: The Clean Water Act's Bleak Present and Future*, 20 HARV. ENVTL. L. REV. 515 (1996).

cooperation, and a little luck, the learning may lead to a better solution.