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Addressing Death by a Thousand Cuts: Legal and Policy Innovations to Address Nonpoint Source Runoff

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Images of the Cuyahoga River burning in the 1960s have been replaced with headlines that read "Farm Runoff in Mississippi River Floodwater Fuels Dead Zone in Gulf"; "Manure, Fertilizer Part of Chesapeake's Problem"; or "Efforts to Address Agricultural Runoff Fail to Improve Iowa's Lakes." (Marder, 2011; Shogren, 2009; Peterka, 2013). After the passage of the Clean Water Act in 1972, substantial progress has been made in addressing pollution coming from point sources such as pipes. However, a huge challenge remains on how best to address the pollution coming from non-point sources: the death of a thousand cuts caused by runoff from farms, city streets and backyard neighborhoods.

A number of legal and policy innovations are underway to address nonpoint sources. Most of these involve innovative applications of the Clean Water Act that broaden its regulatory reach. Others, rooted in the Act, seek to incentivize regulated point sources to invest in less costly nonpoint source pollution control through economic drivers.

The Clean Water Act in Brief

The Clean Water Act is the primary law for addressing water pollution in the United States. Its general objective is to restore and protect the nation's waters. The Act seeks to meet this goal through two primary mechanisms: first, designating uses for particular streams and establishing water quality standards to meet those uses; and second, regulating point sources of pollution.

The Clean Water Act aims to protect and restore water quality to levels sufficient to protect aquatic life and recreation, known as the "fishable and swimmable" goal. (33 U.S.C. § 1251(a)(2)). States must designate uses for their waterways, and then establish water quality criteria based on those uses. (*Id.* 1313(c)(2)(A)). Under Section 303(d), states must also assess and list waters as "impaired" in a biennial report if water quality does not meet designated uses.

To clean up those impaired waters, states or the Environmental Protection Agency (EPA) must establish "total maximum daily loads" (TMDLs) for such listed streams to remedy the impairment and meet the water quality standards. (*Id.* § 1313(d)(1)(C); 40 C.F.R. § 130.7(c)(1)). The TMDL establishes pollutant load allocations for all sources contributing to the impairment which usually requires such sources to implement measures to reduce pollution. Under a TMDL, "Waste Load Allocations" are assigned to point sources such as wastewater treatment plants, while "Load Allocations" are assigned to nonpoint sources such as agricultural runoff.

The Clean Water Act regulates point and nonpoint sources differently. The definition of point sources includes a large list of discharges from a discrete conveyance, like a pipe. Nonpoint sources are everything else, and are essentially diffused sources of pollution such as runoff from farm fields. To discharge into waters of the United States, point sources are required to obtain National Pollution Discharge Elimination System (NPDES) permits which contain technology-based effluent limits.

Nonpoint sources are exempt from such permitting but are regulated indirectly through the Act's water quality provisions and TMDL processes. The legal differences between point and nonpoint sources can be tenuous, as the Supreme Court just confirmed in *Decker v. Northwest Environmental*

Defense Center (2013), holding that channeled stormwater runoff from logging roads was non-point source pollution under EPA's regulations, mainly because the EPA said so.

While the Act has achieved a level of success in regulating point sources through the NPDES permit process, many water bodies still do not meet water quality standards. Though many TMDLs have been developed, few have been successfully implemented. In many areas, progress towards addressing water quality impairment has been slow, largely attributable to the lack of teeth in the Act to address nonpoint source pollution.

There are, however, several recent approaches to implementing the Clean Water Act that hold promise for more success. Some may be described as top-down regulatory approaches; others as bottom-up approaches driven, in part, by economics, but allowed for in law and policy.

The Retooled Regulatory Hammer of TMDLs

The use of top-down regulation is certainly envisioned in the Clean Water Act, and the Chesapeake Bay offers a glimpse of what is to come. In 2010, the EPA issued a TMDL for the Bay, with 92 individual tributary segments for the entire 64,000-square-mile watershed, focused on three main pollutants: nitrogen, phosphorus, and sediment. The EPA required the six states in the watershed and the District of Columbia, also in the watershed, to create Watershed Implementation Plans (WIPs) with approaches for reducing pollution from both point and nonpoint sources to meet the TMDL. The EPA worked to develop a phased approach, with Phase I WIPs submitted in 2010, Phase II WIPs submitted in late 2011, and Phase III WIPs due in 2017. Each WIP is structured by its interim milestones and benchmarks tailored to the individual jurisdiction's priorities. Failure of a state to meet milestones and benchmarks may result in the EPA using additional regulatory authority or "backstops" to ensure that water quality goals are met. The EPA has long maintained that every TMDL for water impaired by both point and nonpoint sources afford "reasonable assurances" that the necessary load reductions will occur. The milestones, benchmarks, and backstops are an integral part of those assurances.

The Chesapeake TMDL and the requirements for states to develop and implement WIPs to address both point and nonpoint sources foreshadow a whole new approach to restoring impaired waters. Because scientists believe that it is the cumulative impacts of many small pollution sources that are now impairing most waters of the United States, a TMDL which starts with the largest receiving water (like the Chesapeake Bay) and works upstream by requiring state and local jurisdictions to develop and implement plans to meet load reductions has the potential to reorient this nation's water quality programs. It incentivizes states to act by ensuring others' accountability, and taps into each jurisdiction's comparative advantages in setting, policing, or optimizing pollution controls, including the use of state laws and regulations that do not draw their authority from the Clean Water Act. In the Chesapeake, problem areas are a mix of urban and agricultural sources and balancing the burdens placed on them can be politically tricky; this is putting pressure on local governments to address these issues. The WIP process allows states to customize their levels of stringency on sources, with water quality gains being maximized from that flexibility.

Despite the promise some see in the TMDL to move towards restoration, it is being fought by parties within the watershed. For example, the American Farm Bureau Federation (AFBF) and the National Association of Homebuilders have challenged the TMDL, arguing EPA lacks authority to set a TMDL for the entire Chesapeake watershed. A major blow to this challenge was dealt on September 13, 2013, when the U.S. District Court for the Middle District of Pennsylvania granted a summary judgment for the EPA, finding it has such authority under the Clean Water Act. The plaintiffs are evaluating their next steps.

Other challenges to the TMDL are pending. Friends of the Earth and other environmental nonprofits have challenged it for allowing water quality trading as one strategy of compliance for the states. Even local elected officials in Maryland have been lobbying their own state government to challenge the TMDL. As these challenges work their way through the courts and legislative processes, the EPA and the affected states continue to push on implementing the TMDL through the WIPs.

More Stringent Water Quality Standards from "Tribes as States"

In another set of developments, Indian tribes are using a provision under the Clean Water Act to set more stringent water quality standards, sometimes more strict than state or federal standards. This potentially subjects nonpoint sources upstream of Tribal waters to the rigors of a TMDL. The U.S. Federal 10th Circuit Court of Appeals, for example, upheld tribal water quality standards for ceremonial and recreational use that were stricter than both federal and state standards; these were enforced against the upstream City of Albuquerque, N.M. (*City of Albuquerque v. Browner 1996*; and Leisy, 2010). The Shoshone Bannock Tribes have also been working to develop standards in Southeastern Idaho which would similarly affect upstream, non-reservation activities. (EPA, 2008).

Casting a Wider Point Source Net Towards Agriculture and CAFOs

In other arenas, the EPA has shown a willingness to test the waters on what constitutes an "actual discharge." For example, recent case law clarified that only those Concentrated Animal Feeding Operations (CAFOs) with "actual discharges" from the production facility must obtain an NPDES permit. (*Waterkeeper Alliance v. EPA 2005*; *National Pork Producers Council v. EPA 2011*). In addition to other requirements, these cases require CAFOs to implement a nutrient management plan for manure applied to land under their control.

Following these decisions, the EPA is examining the potential to broaden the reach of point source regulation on smaller livestock farms that have not traditionally been regulated under the Clean Water Act. In a current case in West Virginia, for example, a poultry farmer sued the EPA over an enforcement order which required the farmer to obtain a CAFO NPDES permit because fan exhaust from the chicken houses emitted dust, dander, and manure particulates which settled on the ground and discharged into drainage ditches and eventually into a stream. (*Alt v. EPA 2013*). Even though EPA withdrew the order, the court declined to dismiss the case and the farmer, joined by the AFBF, continue to pursue the litigation.

While there is no case law on the point, EPA has reserved the right to exert its authority under a provision of its CAFO regulations to designate small animal operations with discharges as CAFOs in need of NPDES permits in the Chesapeake Bay TMDL if state controls over nonpoint source agriculture fail to meet load allocations. (40 C.F.R. § 122.23(c)).

Announcement of a recent agreement between the EPA and the Chesapeake Bay Foundation indicates that further scrutiny of the Clean Water Act's application to livestock farms will be forthcoming. Under the terms of the agreement, EPA will conduct an audit of every Bay state's regulatory program related to CAFOs and other animal operations for compliance with the Act. Targeted inspections of such operations in four small Bay sub-watersheds were also to occur, as well as review of specific CAFO permits and nutrient management plans. The EPA indicates that the data gathered will help it determine whether yet another revision to its nationwide CAFO rule is required.

Regulating Stormwater Runoff as a Point Source

Nationally, the EPA is putting increased pressure on "municipal separate stormwater system" (MS4) pollution as well, which has been regulated by the Clean Water Act as a point source since amendments to the Act in the late 1980s. Many of the Phase II and Phase III WIP milestones in the Chesapeake Bay focus on MS4s where stormwater best management practices (BMPs) have been developing and improving for over a decade. Targeted areas will be under increasing pressure to set, verify, and enforce these BMPs.

Section 402 of the Clean Water Act requires the reduction of MS4 pollution to "the maximum extent practicable," a feasibility standard of relatively uncertain stringency. A recent petition by several environmental nonprofits called on EPA Region I to utilize residual authority under Section 402 to designate previously exempted urbanized areas and impervious surfaces as MS4s. Similar measures are listed among the federal "backstops" that EPA may employ in the Chesapeake if states' WIP goals are not met. Doing so would force these areas to seek permits, institute BMPs, and reduce their pollution to the maximum extent practicable like any other MS4, transforming unregulated nonpoint sources of stormwater into regulated point sources.

Another novel argument under Section 402 is that, in order to meet the "maximum extent practicable" standard, regulated MS4s must require all new development within its jurisdiction to meet low impact development (LID) standards. This is because LID standards constitute the scientifically acceptable method for controlling pollution from stormwater and, therefore, should be enforced by MS4 jurisdictions as construction and post-construction stormwater control measures. While one state administrative board has adopted this approach (*Puget Soundkeeper Alliance v. Washington State Dep't of Ecology, 2009*), there is not yet much legal precedent.

In the most recent round of MS4 NPDES permit renewals, the EPA began requiring MS4s that discharge into impaired waters with TMDLs to develop and implement plans for meeting the waste load allocations established in the TMDLs. Because regulated MS4 municipalities in the Chesapeake Bay watershed all ultimately discharge into impaired waters (i.e., the Bay), they must develop and implement pollution reduction plans to reduce pollutant loads from existing stormwater sources. Such requirements hoist costly compliance expectations upon often cash-strapped municipalities, particularly since urban stormwater retrofits are expensive nutrient reduction practices. Consideration of how to meet these obligations in a cost effective manner has led to some of the "bottom-up" innovations.

Another innovation has been the creation of proxy TMDLs. A proxy for measured, scientifically defensible pollutant loadings—which can be extremely difficult to obtain—is the amount of impervious surface area within a watershed. Impervious coverage has proven a surprisingly reliable indicator of aquatic environmental quality. Several states have experimented with these proxy TMDLs. The National Research Council—an

arm of the National Academy of Sciences—has recommended them. Urban planners have found them more readily integrated into normal planning and land use controls. The legality of this approach is questionable, but its utility may well push the EPA to fight for them in court.

Bottom-Up Opportunities: Water Quality Trading

Water quality trading is a market-based method of reducing pollution from nonpoint sources by creating economic drivers for point sources to invest in nonpoint source pollution control. For example, point sources faced with costly nutrient removal technology upgrades to meet stringent NPDES permit limits (generally resulting from a TMDL) may decide to buy tradable nutrient credits from farmers who have earned the sellable credits by implementing much cheaper BMPs on farms. Water quality trading thus potentially provides point sources a more cost-effective way to achieve water quality standards required by the Clean Water Act.

Nutrient trading programs have been established in Pennsylvania, Virginia, and Maryland to facilitate cost-effective compliance with the Chesapeake Bay TMDL. A number of other pilot programs have been demonstrated in watersheds throughout the country, including in the Pacific Northwest where The Freshwater Trust is working to develop them.

Water quality trading programs must be developed carefully to address a number of legal and policy issues—including whether nutrient reductions from BMP projects are adequately calculated, certified, and verified—and whether adequate application and enforcement provisions exist within the NPDES permit to which credits are applied. The recent lawsuit filed by Friends of the Earth and other environmental groups against the Chesapeake Bay TMDL challenges the legality of the very concept of water quality trading under the Clean Water Act.

A Related Animal: Stormwater Offset and Trading Programs

As mentioned, requirements for MS4 municipalities to develop and implement TMDL and pollution reduction plans have, for the first time, resulted in serious consideration of pursuing stormwater retrofits to reduce pollution and how to pay the costly price tags. Among the innovative solutions for addressing this conundrum is the development of offset programs that would permit MS4s to fund less costly BMPs in more rural parts of the impacted watershed and receive credit toward MS4 pollution reduction requirements. Similarly, new developments—where site constraints make it infeasible to meet existing NPDES stormwater construction permit requirements—may benefit from options to implement or fund offset projects elsewhere in the watershed.

Development of offset or trading programs is already underway. For example, the Pennsylvania Department of Environmental Protection has convened a stormwater offset stakeholders workgroup to develop an offset policy to be released for public comment later this year. Legal and policy issues similar to those raised in trading programs will be at play. In addition, the District of Columbia recently promulgated a new stormwater rule that will require large construction sites to meet more stringent stormwater requirements, but allow them to meet these requirements by buying tradable "Stormwater Retention Credits" (SRCs). These credits would be generated by private landowners in the District, who could voluntarily retrofit their properties with practices such as green roofs and rain gardens in order to generate SRCs.

While offsets and trading can certainly result in implementation of additional practices that reduce nonpoint source pollution from agriculture and stormwater, such programs may not actually play a substantial role in remedying nonpoint source water quality problems, as the primary objective of trading is to reduce the cost of meeting water quality goals. Credits generated from nonpoint sources will be applied towards meeting point source NPDES permit limits that are, in themselves, necessary to meet TMDL goals. Unless sufficient mechanisms are built into offset and trading programs to ensure that such programs improve overall water quality in the watershed, the programs may be little more than pathways for point sources to more cheaply meet their Clean Water Act obligations.

An Uncertain Future for the Clean Water Act and Nonpoint Source Law and Policy

While the Clean Water Act has historically made little headway in addressing nonpoint source pollution, EPA has shown a recent willingness to revisit existing provisions of the Act to facilitate more proactive approaches. Among the most promising is the development of a more robust accountability framework to provide "reasonable assurance" of TMDL implementation. However, several of these approaches—including this one— are under legal challenge. Thus their ultimate success will depend on whether courts agree that the Clean Water Act provides sufficient legal authority EPA's more expansive view toward nonpoint source pollution.

The success of other economics-driven policy developments and approaches, such as trading, will depend on whether more mature markets than have been demonstrated to date will emerge. Even if they do, it is unlikely that they will become the panacea that will solve extensive and persistent water quality problems caused by nonpoint source pollution, since the primary market drivers will

be point sources seeking cost effective options to meet their own regulatory requirements.

For More Information

Alt v. EPA, 43 ELR 20097, No. 2:12-CV-42 (N.D. W.Va. 2013).

City of Albuquerque v. Browner, 97 F.3d 415 (10th Cir. 1996).

Decker v. Northwest Environmental Defense Center, ___ U.S. ___, 133 S. Ct. 1326, 185 L. Ed. 2d 447 (2013).

Environmental Production Agency (2008). Treatment as a State Status for the Shoshone-Bannock Tribes. Available online: http://yosemite.epa.gov/r10/water.nsf/Water+Quality+Standards/SBT-TAS

EPA, Chesapeake Bay TMDL. Available online: http://www.epa.gov/chesapeakebaytmdl/.

Leisy, A.K. (2010). Inherent Tribal Sovereignty and the Clean Water Act: the Effect of Tribal Water Quality Standards on Non-Indian Lands Located Both Within and Outside Reservation Boundaries, Golden Gate University Law Review. Available online: http://digitalcommons.law.ggu.edu/ggulrev/vol29/iss2/2/

Marder, J. (2011). Farm Runoff in Mississippi River Floodwater Fuels Dead Zone in Gulf. PBS Newshour. Available online: http://www.pbs.org/newshour/rundown/2011/05/the-gulf-of-mexico-has.html.

National Research Council (2008). Mississippi River Water Quality and the Clean Water Act: Progress, Challenges, and Opportunities. Washington, DC: The National Academies Press.

Peterka, A. (2013). Efforts to address agricultural runoff fail to improve Iowa's lakes – study. E&E News Publishing.

Puget Soundkeeper Alliance v. Washington State Department of Ecology, Pollution Control Hearings Board 07-022, 07-023 (2009). Available online: http://www.eho.wa.gov/searchdocuments/2009%20archive/pchb%2007-022,07-023%20findings%20of%20fact%20conclusions%20of%20law%20and%20order.pdf

Shogren, E. (2009). Manure, Fertilizer Part Of Chesapeake's Problem. NPR Story. Available online: http://www.npr.org/2009/12/23/121565792/manure-fertilizer-part-of-chesapeakes-problem.

Total maximum daily loads (TMDL) and individual water quality-based effluent limitations. 40 C.F.R. pt. 130 (2001). Available online: http://www.law.cornell.edu/cfr/text/40/130.7.

U.S. Clean Water Act, 33 U.S.C. § 1251 et seq. (1972). Available online: http://www2.epa.gov/laws-regulations/summary-clean-water-act.

Waterkeeper Alliance et al. v. EPA, 399 F.3d 486 (2d Cir. 2005).

National Pork Producers Council v. EPA, 635 F.3d 738 (5th Cir. 2011).

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