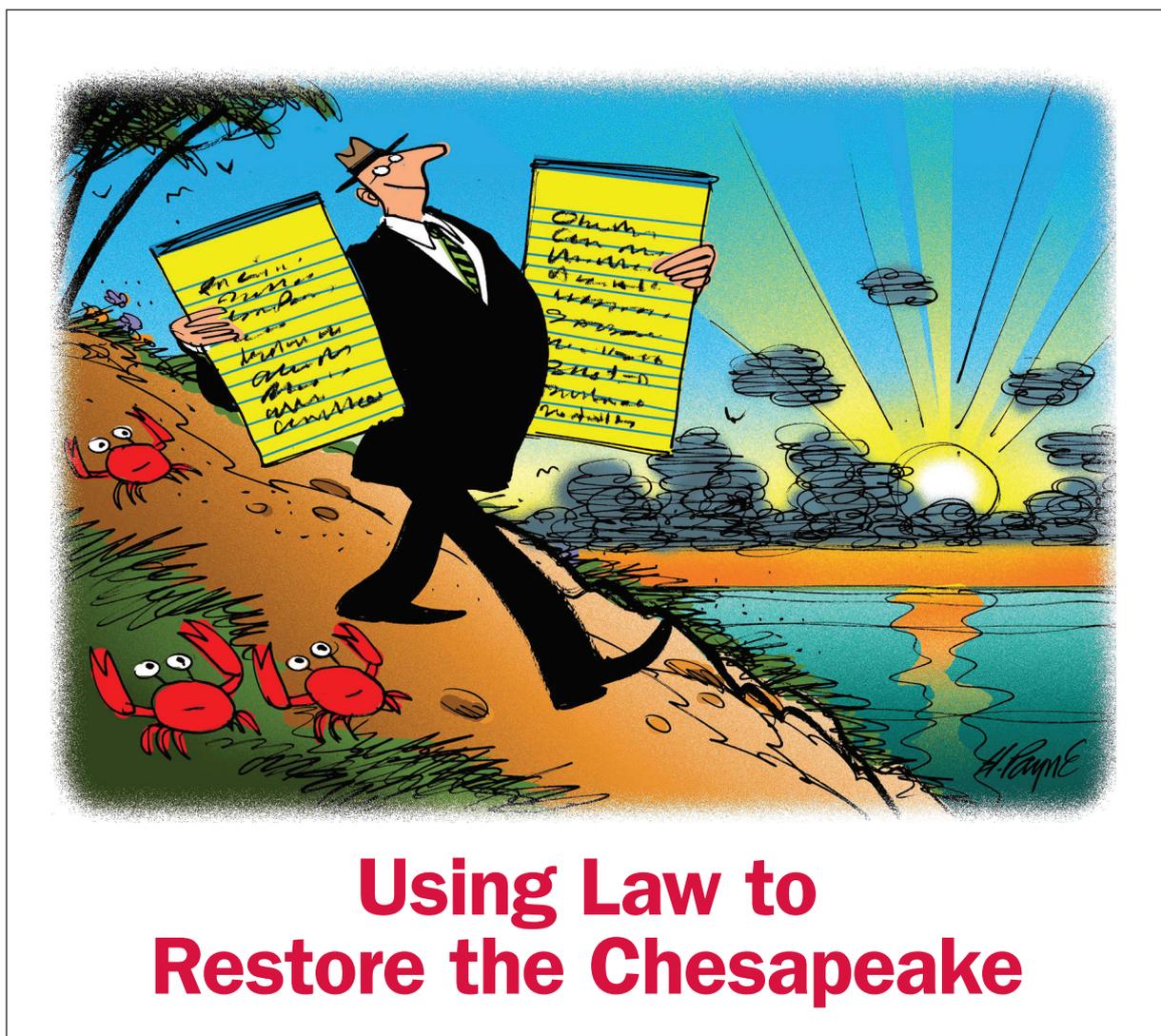


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## Using Law to Restore the Chesapeake

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# Restore the Chesapeake

*The vast bay and watershed include the largest estuary in the country. Efforts to restore its vastly degraded water quality involve a commensurately large response by the Bay States, the federal Environmental Protection Agency, local governments, and the public*



**Ridgway Hall** is vice chair of the Chesapeake Legal Alliance. The views expressed in this article are solely his own.

The most ambitious project ever launched in the United States to restore a polluted estuary and its tributaries is approaching a critical midpoint assessment next year.

This is the implementation of the Total Maximum Daily Load established under the Clean Water Act for the entire Chesapeake Bay watershed. A TMDL is the maximum amount of a pollutant that can be discharged to a waterbody from all sources combined and still meet water quality standards. Virtually all of the Chesapeake Bay is in violation of one or more water quality standards.

The bay watershed covers 64,000 square miles in parts of six states (Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia) and the District of Columbia, referred to collectively as the Bay States. The population in this region is 17 million and growing. The restoration effort by the federal Environmental Protection Agency and the Bay States began over 30 years ago, when it was recognized that excessive discharges of nitrogen, phosphorus, and sediment were causing extensive damage to fish, blue crabs, oysters, and other aquatic organisms, as well as numerous plants, birds, and other animals living in the watershed. The effort went into high gear in December 2010, when EPA issued the TMDL.

As implementation has moved forward at the state and local levels, last July the U.S. Court of Appeals for the Third Circuit upheld this complex multistate TMDL against challenges by the American Farm Bureau Federation, the National Association of Homebuilders, and others claiming that EPA had exceeded its statutory authority. The case, *American Farm Bureau Federation et al. v. EPA*, received national attention because of the size and complexity of this TMDL. Amicus briefs were filed on both sides on behalf of over 100 entities, including states, cities, wastewater treatment agencies, environmental groups, 39 congressmen, 19 environmental law professors, and others from across the country. Multiple key issues of first impression were addressed and resolved.

This article will discuss the main features of the TMDL, the extensive implementation measures under way, the challenges these efforts have faced, and the important legal issues which were resolved by the Third Circuit. In the July/August 2011 issue of this journal, in an article entitled "The Chesapeake Bay TMDL," I described its contents and the long history that led to its issuance. A brief recap of that history is necessary to understand what is

happening today, what must be done in the future, and the significance of the Third Circuit's decision.

**T**he Chesapeake Bay is the largest estuary in this country. Its tributary system includes 180,000 miles of rivers, streams, and creeks. Tens of thousands of point and nonpoint sources discharge wastewater to this system. Even in its currently polluted condition, the bay is a multi-billion dollar contributor to the regional economy through commercial and recreational fishing and numerous support indus-



tries, major seaport and shipping operations, tourism, and a variety of other activities. Its tributaries provide drinking water to millions of people, and large quantities of irrigation water for farming. It is rich in historic and cultural traditions. However, oyster production today is just over 1 percent of its historic high. Blue crab numbers are far below what they once were. The number of watermen whose livelihoods depend on fishing and crabbing are only about 10 percent of what they once were. For the bay and its tributaries, and those who depend on them to survive, this situation has to change.

Starting in 1983, the Bay States and EPA entered into a series of agreements in which they pledged to use their best efforts to reduce discharges of nitrogen, phosphorus, and sediment. Among other things, excess nitrogen and phosphorus causes algal blooms, which then decay and draw the oxygen out

of the water, creating large dead zones where fish and other aquatic organisms cannot survive. Excess sediment destroys the clarity of the water, which blocks light and can stress or kill underwater grasses that provide critical habitat for many aquatic organisms like juvenile fish, crabs, and other organisms at the base of the food chain. These grasses also provide erosion protection and buffering during storms.

Reducing discharges of these pollutants has been especially challenging because two of the largest sources of all three are farming and contaminated urban and suburban stormwater runoff. Nearly all of these are nonpoint sources (i.e., the discharges do not come through a pipe or similar structure), except for large concentrated animal feeding operations and municipal storm sewer systems, and as such are not subject to regulation by EPA. Controlling these nonpoint sources is left to the states.

The interstate nature of the pollution made control by individual states difficult to impossible. The Bay States and EPA, along with the Chesapeake Bay Commission (which represents the legislatures of Maryland, Pennsylvania, and Virginia), known together as the Chesapeake

Bay Partners, had struggled for years on this in vain. One obvious problem is that Maryland and Virginia have no authority to impose discharge limitations on farms and factories in Pennsylvania, even though the Susquehanna River, which flows through New York and Pennsylvania, carries large quantities of pollutants into the waters of these states every day. Most of the pollution control efforts were voluntary and unsuccessful. As a result, in 2007 the Bay States unanimously asked EPA to take the lead in developing a multistate, watershed-wide TMDL.

The setting of a TMDL is part of the process of achieving compliance with water quality standards under Section 303 of the Clean Water Act. A water quality standard identifies the desired use of a waterbody (like swimming or cold water fishery) and the maximum concentrations of any pollutants in the water which must not be exceeded in order to

achieve the designated use. In some cases, as in the Chesapeake Bay, other parameters are used, such as clarity and minimum dissolved oxygen levels. Initially it is a state's responsibility to establish water quality standards for each body of water within its boundaries. If the state's standards are insufficient, or a state fails to set any standards at all, EPA must do so. The state must also list any waterbodies which are not meeting water quality standards (known as impaired waters), and publish a TMDL for pollutants in any impaired waters which are causing the noncompliance. These actions are reviewed by EPA, and if the state fails to list impaired waters or publish a TMDL that the federal agency finds will lead to attainment of applicable water quality standards, EPA does it. The TMDL, along with any related implementation measures, become part of a state's "continuing planning process" under Section 303(e).

While the statute is clear on the setting of a TMDL by EPA if a state fails to do so, it is silent on what the federal agency can do to help or encourage the states to effectively implement a TMDL. EPA has had regulations in place for over 25 years spelling out the roles of the states and EPA in achieving water quality standards. The TMDL-related provisions have never been challenged.

Setting a multistate TMDL for a large and complex system like the Chesapeake Bay watershed is extraordinarily difficult. While the need was clear, EPA had never done anything of this scale before. There was 30 years of water quality monitoring throughout the bay and much of the tributary system, and information developed by the states over the years on where the pollution was coming from and how discharges migrate and behave in the system. Nevertheless, the development of the TMDL took three years, involving hundreds of public meetings, and input from scientists, public officials, and other interested persons. Using this data and a sophisticated watershed model (actually several models working together), the agency constructed a framework to bring discharges from tens of thousands of sources in seven different jurisdictions down to levels designed to achieve compliance with water quality standards.

The states had asked EPA to set an overall TMDL for each pollutant for the entire watershed, and then to allocate the loadings among the states, based mainly on each state's pollutant contribution, with target dates and milestones to ensure that each state would be doing its fair share as the implementation stage goes forward. The TMDL that was issued in

2010 included a watershed-wide cap on nitrogen of 201 million pounds, phosphorus of 12.5 million pounds, and sediment of 6.5 billion pounds. This requires a reduction in overall discharges of 25 percent of nitrogen, 24 percent of phosphorus, and 20 percent of sediment from 2009 levels. EPA then provided allocations by state and major river basin.

In addition, in light of the territorial size of the statewide allocations, the agency included allocations to a number of large sources whose discharges are regulated by permits, and to broad categories of dischargers called "sectors" of mainly nonpoint sources (such as agricultural operations or urban stormwater runoff). Clearly discharge reductions of this magnitude will require many years and enormous resources. Accordingly, EPA, with the concurrence of the states, prescribed target dates of 2017 for the states to get the necessary control measures in place to achieve 60 percent of the needed pollution reduction, and 2025 to get measures in place designed to achieve all of the needed reductions.

As part of the final process during 2010 leading up to the TMDL, each state developed a Watershed Implementation Plan to determine initially how its allocation would be spread over various sources, and what measures, programs, funding, and other resources would be mobilized, and over what time frames, to bring down the discharges. This helped EPA work out the state and major tributary allocations, and provided "reasonable assurance," in the agency's words, that progress is being made. Finally the federal agency and the states established a system of two-year milestones, for which the states set interim goals on the way to full implementation. Every two years EPA and the states review the progress, with the results, like the WIPs themselves, posted on EPA and state websites. While the federal agency has not hesitated to nudge states where more rapid progress is needed, the states have the final say on what measures will be taken by which sources.

So who is doing what? The WIPs were revised by the states after the TMDL was finalized to provide greater detail (called Phase 2 WIPs), and can be amended periodically as new information is developed during implementation. They will get major reviews and revisions one more time following the 2017 target to have 60 percent of the implementation measures in place (Phase 3 WIPs). This "midpoint assessment," mentioned at the top of the article, will be critical in setting the course for full implementation by 2025. Much of the work is going on at the local and county levels.

Lots of energy has been devoted to helping farm-

*Continued on page 38*

# Cooperation, Coordination, Collaboration

To understand the nature of the Chesapeake Bay Total Maximum Daily Load, it is important to understand the origins of the Chesapeake Bay Program partnership. The District of Columbia, Maryland, Pennsylvania, and Virginia and the federal Environmental Protection Agency formed the initial partnership in 1983 by signing a one-page agreement which recognized that fixing the bay's pollution problems required these jurisdictions to work together in a cooperative and coordinated way. This recognition has provided a common thread running through all of the bay restoration agreements and efforts since then.

The Bay 2000 Agreement revision contained more than 100 goals, outcomes, and objectives regarding water quality, living resources, land use, and stewardship. By 2002, the states of Delaware, New York, and West Virginia had joined on to the partnership through a memorandum of agreement focused on water quality. The expanded partnership collectively agreed that, if the established water quality goals could not be reached by 2010, a TMDL would be needed. In 2007, the partnership reached consensus that the goals would not be achieved by the 2010 deadline. The jurisdictions agreed that EPA would establish the bay TMDL in collaboration with the other members of the partnership.

The partnership's history of cooperation and collaboration in setting goals and working together to achieve them extended into the development of the bay TMDL. As part of that process, EPA set target loads for nutrients and sediment for each state and major river basin. Each bay jurisdiction then developed Watershed Implementation Plans that committed to pollutant load reductions from various

sectors, including wastewater, septic systems, urban and suburban stormwater, and agricultural runoff.

In 2010, EPA established the TMDL, using in major part the jurisdictions' proposed load reductions. The TMDL reflects the partnership's goal that all of the pollution control measures needed to meet water quality standards be in place by 2025, with measures in place by 2017 that, when fully implemented, will meet 60 percent of the goals. The 2014 Chesapeake Bay Watershed Agreement, signed by all seven of the watershed jurisdictions, reaffirmed each member's commitment to restore the bay by continuing to implement the TMDL in their respective state plans.

The partnership also agreed to develop two-year milestones to guide implementation and measure progress toward achieving the pollution reduction targets. Each year, the bay jurisdictions submit data to EPA detailing the measures that they have implemented. The agency then calculates the pollutant reductions that implementing those measures achieved, and provides feedback to the jurisdictions to enable them to adjust their programs to stay on track.

This formal feedback mechanism, which didn't exist under the earlier, voluntary agreements, is showing us that while we have made progress in reducing pollution, and the jurisdictions are ahead of the watershed-wide 2017 target for phosphorus, they are lagging in meeting the targets for nitrogen and sediment. So challenges remain for all of us.

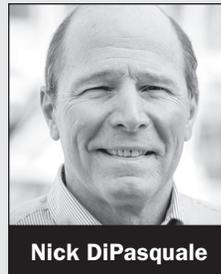
The partnership is also developing a Best Management Practice Verification Program. This program is designed to confirm that prac-

tices being reported on paper have in fact been installed on the ground, and they get reviewed to ensure they are operating effectively over time. Verifying these BMPs is essential to effectively implementing the TMDL, achieving water quality standards, and maintaining public confidence.

One of the most exciting aspects of the TMDL process has been seeing the innovation it has spurred throughout the watershed. The partnership has approved nearly 200 BMPs and has convened dozens of expert panels to review new pollution control techniques and technologies for reducing nitrogen, phosphorus, and sediment loads.

Local governments and watershed organizations are incorporating green infrastructure as part of road and park projects, using vegetation, soils, and natural processes to manage stormwater and create healthier local environments, while reducing the cost of meeting their TMDL targets. Green infrastructure also has been shown to reduce flooding, property damage, and the need for road, sewer, and water line repairs. Finally, green infrastructure projects stimulate economic activity at the local level and improve the health and livability of communities.

The 30-year history of the Chesapeake Bay restoration effort has been one of cooperation, coordination, and collaboration among the jurisdictions and EPA. This spirit continues to manifest itself through the ongoing implementation of the bay TMDL. I am confident it will continue to guide the partnership as we move toward the goal of restoring the Chesapeake.



Nick DiPasquale

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ers implement nutrient management plans and Best Management Practices, or BMPs, to reduce the largest single source of all three pollutants: contaminated runoff from farms. In urban areas, green-design initiatives have produced clustered and vertical housing, rain gardens, green roofs, permeable driveway and parking lot surfaces, and a variety of other measures to reduce contaminated stormwater runoff. The need to fund these projects has stimulated creative initiatives in financing.

Because the cost per unit of reducing nutrient discharges is much lower for farming operations than for wastewater treatment plants, Virginia and Pennsylvania have developed nutrient-trading programs. This will enable a farmer or other operator to reduce its pollutant discharges below what is legally required to meet the TMDL and any more stringent requirements, and thereby generate a credit that can be sold to a buyer, usually a regulated point source, for whom the cost of reduction per unit is much higher. The credit becomes part of the buyer's National Pollutant Discharge Elimination System permit and is enforceable. Typically the buyer and seller provide by contract what happens if the BMP that generated the credit fails during its expected life. Such a credit can also be used to offset new or increased discharges.

Environmental groups have expressed concerns that hotspots of degraded water may develop near the credit buyer, and that the credit-generating BMPs may not perform as predicted. They are pressing for transparency, verifiability, and enforceability. EPA has been issuing technical memoranda setting forth its expectations for a reliable trading program, and addressing these concerns. Maryland has a trading program developed by the state Department of Agriculture that is currently limited to farm credit generators, and only to offset new or expanded discharges. The state Department of the Environment is contemplating expanding this program.

Virginia and Maryland have also established "agricultural certainty" programs under which if a farming operation implements all necessary measures to achieve the applicable 2025 TMDL goals, it will receive a shield (9 years in Virginia, 10 years in Maryland) from any more stringent state regulation. These programs, like trading, are designed to provide incentives for farmers to implement pollution controls sooner rather than later. As of this writing, Virginia's program had attracted over 280 applicants, 53 of whom had management programs in the implementation stage, after which they will be evaluated by third-party verifiers. Maryland's program was still in the early implementation phase.

In addition, the TMDL and WIPs have stimulated an enormous amount of private-sector activity by individuals and groups, businesses, NGOs, universities, and others to help either by performing or supporting specific conservation and restoration projects, or by providing funds. There has been a huge increase, for example, in river and stream cleanups, harbor restoration, streambank revegetation, tree planting, better waste management and recycling, and efforts to educate and inform the public about the many things they can do to reduce pollution. NGOs have spent millions of dollars to fund technical studies and environmental restoration. A Chesapeake Bay Funders' Network was formed to coordinate priorities. There is a widening recognition that this may be the last chance to restore this unique watershed, which means so much to so many.

Over 200 environmental organizations have joined forces under an umbrella group known as the Choose Clean Water Coalition. They include national organizations like American Rivers, the Sierra Club, and the Natural Resources Defense Council, regional entities like the Chesapeake Bay Foundation, Conservation Pennsylvania, and the Piedmont Environmental Council, and local groups like the Rock Creek Conservancy and Friends of Sligo Creek. This enables these groups to speak with one, broadly representative voice to government officials, the press, and the public. They can form work groups addressing particular issues, drawing on the entire membership for talent.

In addition there are Riverkeepers and Waterkeepers who monitor discharges to specific waterbodies, notify facility owners or operators of any illegal discharge, and work with them to correct it. For example, the Upper Shenandoah Riverkeeper has contacted farmers to help them secure state funding and technical assistance to fence cattle out of streams. If an operator refuses to correct the problem, the waterkeeper can file a complaint with the state agency, which can follow up directly.

The restoration efforts had received a big boost from an executive order issued by President Obama in 2009 declaring the bay to be a "national treasure" and directing the seven federal agencies with jurisdiction over various bay-related activities to work together, and also with the states and private sector, under EPA's leadership to not only restore water quality, but to improve wildlife habitat, public access, and environmental education in schools. Most of these agencies — the Departments of the Interior (including the Fish and Wildlife Service and the U.S Geological Survey), Agriculture, Commerce (notably the National Oceanic and Atmospheric Administration), Defense (with the Army Corps of Engineers), Homeland Security, and Transportation — and the states' environment and

natural resources departments, had been working together less formally for years on bay matters. Several decades earlier the Bay States and EPA had created the Chesapeake Bay Program to help administer on a daily basis their watershed-related projects. The program has an office in Annapolis with a staff of 22 supplied by EPA (it is organizationally within EPA Region 3), and with able and dedicated leaders. CBP administers various programs, such as evaluating conservation and pollution protection measures, coordinating water quality monitoring, convening work groups to address technical and scientific issues, helping to secure and target funding, organizing training workshops, and engaging the public. Most importantly, CBP staff work closely with the states on the implementation of their WIPs.

In 2014 the Bay States, EPA, and the Bay Commission signed a Chesapeake Bay Watershed Agreement — the fourth such agreement in 32 years. Among other things this document lists 11 environmental goals and specific, measurable outcomes for each. This includes not just the water quality goals reflected in the TMDL but also the broader set of objectives listed in the executive order. In addition, management strategies have been developed to provide focus and direction. Implementation teams and work groups have been formed that include knowledgeable agency personnel, academics, and private persons with relevant knowledge or expertise. They have been meeting regularly to carry out their missions.

Not surprisingly, there have been many bumps in the road, including a shortage of funding from federal and state agencies, a shortage of technical assistance to help design and install the numerous BMPs needed to address contaminated runoff from farms and urban areas, and challenges at the local level to securing the needed resources to implement pollution-control measures. In addition, the original expectations on how quickly an installed BMP would produce improved water quality have often proven overly optimistic. In some cases there has been political opposition to projects, usually kindled by lobbyists for industry groups who contend that they are being asked to spend too much, or do more than their fair share, resulting in delays or abandonment. There are too few inspectors to detect problems and make sure that laws and WIP commitments are being complied with. As a result, some of the states are already behind on their milestone goals.

Last June, EPA published the results of its reviews of each state's 2014–15 milestone progress. While most of the states were doing fairly well overall, most also were behind for one or more of the pollutants in

at least one major sector. Pennsylvania was found to be not on track to meet its goals for nitrogen or sediment reduction. The major shortfall areas were agriculture and urban/suburban polluted stormwater runoff. On both of these there is an acute need for more rigorous runoff controls and better enforcement.

Animal manure is the biggest single source of nitrogen and phosphorus pollution in the watershed. It not only runs off large animal farms where it is not adequately managed and disposed of, but it is used as cheap fertilizer on row crops, where it has historically been over-applied in an effort to maximize production. The excess often runs off into streams. Manure can also be discharged directly by cattle who are not fenced out of streams. On Maryland's Eastern Shore, and elsewhere, there are enormous factory farms housing in some cases over 100,000 chickens, packed tightly in buildings which are often over 600 feet long. Despite concerns about the resulting pollution, including calls for a moratorium, more such factory farms are being proposed, in areas where the soil is already saturated with phosphorus and, in many cases, nitrogen as well. This is going to have to change, though for many farmers change comes hard, particularly if it means reduced profits.

Controlling pollution from farming operations is posing challenges throughout the watershed. This is due to a number of reasons, including the fact noted above that the vast majority of this pollution is coming from nonpoint sources over which EPA has no direct regulatory authority, so that the burden of imposing controls falls on the states. It has been said that agriculture is the only major industry in this country that is not required to properly manage and dispose of its waste. The extent to which this is true depends on state laws, which have not been robust. In Pennsylvania, as in the other Bay States, much depends on implementation of nutrient-management plans and other BMPs. The technologies are well-known, and include streamside buffers, winter cover crops that prevent or reduce nutrient runoff, no-till agriculture, tree planting, cropland irrigation management, smart fertilizing that avoids excessive use of nutrients containing nitrogen or phosphorus, fencing cattle out of streams, erosion controls, and many other actions. Unfortunately, not all farms have such plans in place, and many that are in place on paper are not being fully implemented.

The U.S. Department of Agriculture provides financial and technical assistance to farmers to install pollution-control and land-conservation measures through its Environmental Quality Incentives Program, its Conservation Stewardship Program, and other measures. This assistance is normally coordinated with the state agencies, which provide similar

support. It is also at times matched by funding and support from groups like the Chesapeake Bay Foundation, The Nature Conservancy, and the National Fish and Wildlife Foundation. Regarding poultry farms, efforts to persuade the large “integrators” who control the operations to take responsibility for management of the waste have been largely unsuccessful, and no state legislature in the watershed has required it. Efforts have been made to develop waste-to-energy technologies that are cost-effective and do not cause air pollution problems, but so far with limited success.

Despite these challenges, the farming community is not monolithic. There are many farmers who understand the importance of environmental stewardship and who are implementing measures to minimize waste and protect water quality. Many others have indicated that they would do so if they could get financial and technical assistance. Unfortunately these are in short supply. USDA funds were cut by budget sequestration, and there is substantial concern that the department has not made the bay watershed restoration a higher priority.

Until July 2015, the legality of the bay TMDL, on which this massive restoration effort is based, was under a cloud. The American Farm Bureau Federation, the National Association of Homebuilders, and other business associations brought suit in 2011 in a federal district court in Pennsylvania seeking to overturn the TMDL. They raised a number of objections, all of which were rejected by the court in a thoughtful and detailed opinion in 2013. An appeal was filed with the Third Circuit, which affirmed last summer.

The Third Circuit’s decision is important not only because it upheld the bay TMDL, but also because it addressed and resolved a number of key issues which until then had been unclear. The Farm Bureau claimed that EPA had exceeded its CWA authority, and improperly impinged on areas left to the states, by allocating the overall bay watershed loadings among a number of large permitted point sources and sectors of other sources of pollution; by requiring the states to provide “reasonable assurance” of progress through their WIPs; and by specifying target dates for implementation of pollution-reduction measures.

The court first took up an issue that the parties had not raised, namely, subject-matter jurisdiction, and specifically standing and ripeness. The court first held, as courts before it had said, that a TMDL is an “informational tool” and not a regulation. It cannot by itself be enforced against anyone. Instead, it provides a basis for regulatory action, which can be enforced. So if a

TMDL cannot be enforced against anyone, how can anyone have standing to challenge it?

The court, citing Supreme Court precedent, held that when an entity plausibly asserts “likely economic injury” from an action, it has standing to challenge that action. It then found it highly likely that the regulations and other requirements that would be issued to implement the TMDL would impact the American Farm Bureau’s members; therefore it had standing. The court also found the case ripe for review because it was action by an agency promulgated on a fully developed administrative record, and review at this point would be preferable to deferring action until it might be challenged later in the context of a review of a particular permit or other action allegedly based on the TMDL. As the court put it: “If something is wrong with the TMDL, it is better to know it sooner rather than later.” This is probably why the government did not raise this potential defense.

As to the substantive challenges, the court noted initially that the Clean Water Act does not expressly authorize EPA to take any of the challenged actions; nor does the act preclude them. Because the statutory language that discusses TMDLs, Section 303(d), is ambiguous as to exactly what EPA can do to ensure implementation within a reasonable time frame, the court held that EPA was entitled to the customary deference accorded expert agencies under the 1984 *Chevron* decision. The court observed that often Congress speaks in broad terms, leaving the details or gaps to be filled in by the agency, based on its expertise and evolving experience. So long as the agency action is reasonable and is consistent with the statutory language and purpose, it should be upheld.

In evaluating the reasonableness of EPA’s measures, the court looked to the broad statement of the restorative goals of the statute in Title I, and described the Clean Water Act as “a comprehensive legislative attempt to restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” The court also noted that Section 303(d)(1)(C) requires that a TMDL should be established at a level “necessary to implement the applicable water quality standards.” From this the court concluded that Congress clearly intended that water quality standards should be met, and therefore TMDLs should be implemented, within some reasonable time. The court held that EPA acted within its authority, and consistent with the CWA goals, in requiring “reasonable assurance” of progress by the states through their WIPs and the biennial reviews, and by specifying target dates for achievement.

While WIPs as such were novel, and the level of detail was unprecedented, the court recognized that the states could prepare these as part of the planning

process prescribed in Section 303(e) designed to lead to compliance with TMDLs and water quality standards. The question raised by the Farm Bureau was whether EPA went too far in issuing “expectations” that the contents be precise in laying out the measures the state planned to take, and the authority and resources it would apply to achieve the pollution-reduction goals. The court held that it did not.

The court also held that EPA had the authority to establish, in addition to the total watershed-wide maximum loadings and allocations among the states, the further allocations among large point sources and sectors of other sources. In upholding the reasonableness of these measures the court emphasized the enormous size of the area covered by the TMDL, and the complexity of allocating maximum pollutant loading levels among tens of thousands of point and nonpoint sources.

Finally the court held that EPA’s actions did not improperly impinge on the primary right of the states to make the detailed choices as to which sources to regulate, and how stringently, to achieve the TMDL loadings, because those choices were, in fact, left to the states. Nor did EPA improperly intrude into matters of land use, which is traditionally the province of the states and local bodies. The Third Circuit’s ruling would remove the legal cloud, except for the fact that the Farm Bureau has filed a petition for certiorari with the Supreme Court, so the case is not yet over.

**M**eanwhile the ongoing challenges to implementation are substantial. In the runup to the 2017 midpoint assessment, questions have been raised as to how to measure progress across a region so large that it has been impossible to actually inspect each of the many thousands of locations where BMPs have been promised, but may or may not have been implemented. The few reports that exist, plus anecdotal evidence, suggest that many have not been put in place, and many that have are not yet fully implemented, or may not be getting the water quality benefits that were initially expected. EPA has traditionally relied on modeling, using the best available factual information and realistic assumptions to calculate — or really just estimate — the progress that has been made. Each state is developing a verification plan to close this information gap.

In the spring of 2015 EPA released some estimates of progress on nutrient reduction, based on admittedly incomplete data in the Bay Watershed Model, and the results appeared quite good. However, at the same time, actual monitoring data gathered by USGS in the relevant waterbodies showed no improvement in

the pollutant levels. While incomplete data were part of the problem, other factors at work include the lag time that can occur between the implementation of management practices and the time when they result in water quality improvement.

There are several reasons for this. First, some BMPs, like planted forest buffers, take years to mature and become fully effective. Second, some BMPs are designed to reduce groundwater pollution. Because it can take several years or more for the groundwater to reach a stream, this results in a lag time between implementation and resulting water quality improvement. This is why the target dates call for implementation of the measures needed to attain water quality standards, not their actual attainment.

An additional challenge as we approach the midpoint assessment is how to give credit in the model to various BMPs, based on estimated pollution removal efficiencies that are inherently uncertain. EPA has relied on expert panels for advice on this, but reasonable experts can disagree. In particular, disagreement has arisen over the appropriate phosphorus reductions based on the use of nutrient-management plans of varying sophistication. A significant error could result in an overestimation or underestimation of progress.

The states will revise their WIPs after the 2017 evaluation, using their findings to set forth the measures they will take to reach the 2025 goal of full implementation. If the midpoint evaluation overstates the amount of progress made on the ground, this could lead to less rigorous commitments in the revised WIPs than in fact would be required to meet the 2025 goals. Understatement might cause some to give up. A final uncertainty is mother nature: heavy rains can wash out some types of BMPs and skew water quality monitoring results.

The Chesapeake Bay watershed restoration remains a work in process, and it is stimulating the use of adaptive management. If something doesn’t work, something else is tried. EPA is in the process of revising, and hopefully improving, its model.

To me, the most extraordinary feature of all these efforts is the extent to which large numbers and diverse groups of people are devoting their efforts and resources, inspired by the vision of a restored and healthy Chesapeake Bay watershed, where the water quality and adjacent habitat are clean, children can safely play and swim, farmers and fishermen prosper, and the cultural and aesthetic qualities of this unique part of our country are preserved. If the effort succeeds, it will be due in no small part to the framework and incentives provided by the far-reaching actions taken by the Bay States and EPA under the Clean Water Act and related state laws and regulations. **TEF**