Water Quality and Agriculture: Assessing Alternative Futures

*Robert W. Adler**

I. Introduction

My assigned role on this panel was to be the "neutral academic" – a term many would find to be an oxymoron. Unaccustomed as I am to being neutral on almost any topic, but on this topic in particular, this turned out to be a rather difficult task. So denied of what I thought was my inalienable right to be an adversarial provocateur, I decided to compromise and to be a "neutral provocateur," which means that I will try to provoke all of my fellow panelists rather than being selective.

But first we need a little background. I will begin by summarizing our legal and regulatory approach to agricultural water pollution, and by assessing briefly the relative degree of success of those programs. While the "total maximum daily load" ("TMDL") provision of the Clean Water Act ("CWA")[1] currently is the major focal point for discussion of nonpoint source pollution control efforts (as well as many other aspects of water pollution control), this requirement cannot be viewed in isolation from other efforts to control agricultural and other sources of polluted runoff. Then, as the more provocative part of my paper, I will posit a set of four "alternative futures," four distinctly different proposals for future policy in this area; and I will challenge my colleagues–and subsequent readers–either to choose from among them or to present their own vision of the future.

II. Agricultural Water Pollution: A Brief History and the Current Reality

There is by now a common misconception about the history of modern water pollution control policy in the United States.[2] Under the revisionist but inaccurate view, we began in 1972 with the assumption that most water pollution resulted from public sewage and industrial discharges spewing out of large pipes; and it was only after full implementa-

---

* Professor of Law, Wallace Stegner Center for Land, Resources and the Environment, S.J. Quinney College of Law, University of Utah

1 33 U.S.C. § 1313(d) (1987).

2 By "modern" I mean beginning with enactment of the 1972 amendments to the Federal Water Pollution Control Act, Pub. L. No. 92-500, (codified as amended at 33 U.S.C. §§ 1251 *et seq.*) now commonly known as the Clean Water Act ("CWA").

tion of the first round of point source controls that we realized, sometime in the mid-1980s, that agriculture was really responsible for significant amounts of water quality impairment.[3] The distinction is not just of historical interest. It is important to policy analysis because it shifts our perspective about the relative degree of success in reducing agricultural water pollution under current policies. Under the revisionist view we have only been in the business of agricultural water pollution control for 15 years or so, and perhaps more time is warranted before admitting that the current approach has failed. Under a more accurate historical perspective, we have been relying on existing tools for at least three decades, and far longer if one considers soil erosion control and similar programs dating back to the 1930s.

Any doubt about our understanding of the significance of water pollution problems caused by agricultural sources (and other sources of polluted runoff) is dispelled by the 1972 Senate Report on the Clean Water Act:

> One of the most significant aspects of this year's hearings on the pending legislation was the information presented on the degree to which nonpoint sources contribute to water pollution. Agricultural runoff, animal wastes, soil erosion, fertilizers, pesticides and other farm chemicals that are part of runoff, construction runoff and siltation from mines and acid mine drainage are major contributors to the Nation's water pollution problem. Little has been done to control this major source of pollution .... It has become clearly established that the waters of the Nation cannot be restored and their quality maintained unless the very complex and difficult problem of nonpoint sources is addressed.[4]

Accordingly, Congress did, in fact, adopt a comprehensive program to address agricultural pollution in the 1972 Clean Water Act. In section 208 of the statute, Congress directed states to adopt area-wide waste treatment management plans to include:

---

[3] In a 1989 report to Congress, for example, EPA asserted that nonpoint source impacts had not been assessed fully; that control efforts had focused largely on traditional point sources, which were viewed as causing the most significant, most visible problems; and that it was "now very clear" that nonpoint sources also caused widespread impacts. U.S. EPA, A REPORT TO CONGRESS: ACTIVITIES AND PROGRAMS IMPLEMENTED UNDER SECTION 319 OF THE CLEAN WATER ACT–FISCAL YEAR 1988 at 7 (1989).

[4] S. Rep. No. 92-414 (1971), *reprinted in* 1972 U.S.C.C.A.N. 3668, 3705. Other evidence also pointed to dangers from agricultural pollution. A national pesticide survey conducted in 1967-68 by the U.S. Bureau of Sport Fisheries measured DDT in 584 out of 590 fish samples, with levels up to 9 times the limit set by the Food and Drug Administration. *See* DAVID ZWICK & MARCY BENSTOCK, WATER WASTELAND (1971).

a process to (i) identify, if appropriate, agriculturally and silviculturally related nonpoint sources of pollution, including return flows from irrigated agriculture, and their cumulative effects, runoff from manure disposal areas, and from land used for livestock and crop production, and (ii) set forth procedures and methods (including land use requirements) to control to the extent feasible such sources.[5]

Thus, far from ignoring agricultural pollution in 1972, Congress sought to address the problem squarely, but through plans and implementing methods developed at the state and local rather than at the national level. Moreover, Congress also included in the 1972 law the now-famous but long obscure TMDL provision designed to ensure that the combination of controls implemented to address both point and nonpoint sources would suffice to assure attainment of ambient water quality standards.[6]

Unfortunately, neither the states nor EPA succeeded in accomplishing Congress' goals under either of these provisions. The "total maximum daily load" ("TMDL") provision of the statute, now virtually a household word in environmental circles, lay dormant due to an intentional EPA policy decision to focus first on technology-based controls on municipal and industrial sources.[7] By contrast, the state devoted a significant amount of time and effort to development of section 208 plans.[8] In large part because implementation was left to state discretion, however, as well as inadequate attention on the part of EPA, few mandatory requirements were adopted in favor of largely voluntary, education-based and cost-sharing strategies.[9] By the late 1970s, Congress and others acknowledged that the section 208 program suffered from numerous problems, including insufficient funding, inadequate water quality data, poor EPA management, lack of public education and awareness, and other factors.[10] Unlike other provisions of the law in which EPA could step in and take action if a state failed to do so,[11] EPA lacked any

---

5 33 U.S.C. § 1288(a)(2)(F).

6 33 U.S.C. § 1313(d), discussed *infra*.

7 *See generally,* Robert W. Adler, *Fresh Water–Toward a Sustainable Future*, 32 Envtl. L. Rep. 10167 (2002) (hereafter "*Sustainable Future*"); Oliver A. Houck, The Clean Water Act TMDL Program: Law, Policy and Implementation (1999); Robert W. Adler, *Integrated Approaches to Water Pollution: Lessons from the Clean Air Act*, 23 Harv. Envtl. L. Rev. 203 (1999) (hereinafter "*Integrated Approaches*").

8 Statewide plans were developed in 49 states, and a total of 179 regional 208 plans were created, with significant public participation. Robert w. Adler et al., The Clean Water Act: 20 Years Later 184 (1993) (hereinafter "20 Years Later").

9 *See id.; Sustainable Future*, *supra* note 7, at 10174.

10 *See* 20 Years Later, *supra* note 8, at 184.

11 *See, e.g.*, 33 U.S.C. §§ 1313(d) (concerning water quality standards and TMDLs), 1342 (concerning NPDES permits).

authority to develop or to implement section 208 plans for delinquent states.

In 1987, Congress sought to strengthen control of agricultural pollution and other sources of runoff by passing a new nonpoint source pollution control provision in section 319 of the CWA.[12] The new provision increased the stakes somewhat, but mimicked section 208 in many respects. It required states to complete comprehensive nonpoint source pollution assessments statewide, but where possible on a watershed basis;[13] and to prepare and implement comprehensive nonpoint source pollution control plans to address the identified problems.[14] Congress strengthened the substantive standard for runoff controls modestly, from "to the extent feasible" in section 208 to "to the maximum extent practicable" in section 319(a)(1)(C). But while EPA could complete nonpoint source assessments for noncomplying states under section 319(a), as with section 208 it lacks authority to develop and implement actual control plans and measures if a state fails to do so adequately. EPA's only recourse was to withhold grant funds, which EPA has never done and which were sparse in any event.[15] Congress has enacted no major changes to the CWA since that time, due to political deadlocks over CWA reauthorization.

As a result, overall results under section 319 were little better than under section 208.[16] State-developed controls remain largely voluntary, although there has been a minor trend toward state adoption of enforceable controls.[17] By 1991, EPA reported that agricultural runoff caused or contributed to the impairment of over 100,000 miles of rivers, 2 million acres of lakes, over a million acres of coastal waters, and about 5,000 square miles of estuaries.[18] A 1997 report on water quality and agriculture released by the Natural Resources Conservation Service ("NRCS") in the U.S. Department of Agriculture ("USDA"), presents a more complex although somewhat more encouraging picture. Based on data through the early 1990s, NRCS found significant ongoing water quality problems caused by agriculture on a national basis, although with some areas of improvement and some deterioration:

---

12 33 U.S.C. §1329. In 1987 Congress also added a separate regulatory provision governing runoff from municipal and industrial sites, *see* 33 U.S.C. § 1342(p), discussed *infra* note 35.

13 33 U.S.C. §1319(a).

14 33 U.S.C. §1319(b).

15 *See* 20 YEARS LATER, *supra* note 8, at 189.

16 *See id.* at 189-91.

17 *See* ENVIRONMENTAL LAW INSTITUTE, ENFORCEABLE STATE MECHANISMS FOR THE CONTROL OF NONPOINT SOURCE WATER POLLUTION (1997).

18 *See* 20 YEARS LATER, *supra* note 8, at 173-74 (*citing* EPA, MANAGING NONPOINT SOURCE POLLUTION (1991) and EPA, NATIONAL WATER QUALITY INVENTORY (1990)).

- Soil erosion on U.S. crop lands declined significantly during the 1980s. Nevertheless, siltation and other suspended solids, more than half of which comes from agricultural fields, remains the leading cause of impairment of rivers and streams and the second leading cause of impairment of lakes, reservoirs, and estuaries.
- Nutrients from agriculture and other sources were the leading cause of impairment in lakes, reservoirs, and estuaries, and the third leading cause in rivers and streams.
- Nitrates in surface and groundwater, which derive primarily from nitrogen fertilizers, improved in some areas but declined in others.
- Phosphorus fertilizer use dropped 22 percent nationally from 1982 to 1992, resulting in widespread declines in total phosphorus concentrations in water bodies.
- Fecal contamination, an indicator of pollution from animal wastes, improved generally but unhealthy concentrations continued to be "widespread".
- Pesticide use in the United States declined generally, but inadequate data existed to identify water quality trends for pesticides.[19]

These findings by NRCS are significant because numerous USDA programs, largely in the nature of economic incentives, cost-sharing and technical assistance, augment the quasi-regulatory programs provided for in the CWA. While USDA programs have varied and evolved over the years, major provisions include the Conservation Reserve Program (CRP), under which farmers receive rental payments and financial assistance to convert highly erodable lands to vegetative cover; the Environmental Quality Incentives Program (EQIP), under which cost-sharing and other financial incentives are provided to farmers to address soil erosion, water pollution, and other natural resource concerns; and the Wetlands Conservation ("Swampbuster") program and Wetlands Reserve Program (WRP), under which landowners are paid to establish conservation easements and given incentives to restore wetlands on their properties.[20]

Whatever local, regional, and even national improvements have been made in agricultural pollution control, however, from a national perspective the problem is not even close to being solved. The five most recent biennial national water quality reports issued by EPA show little overall change in the degree to which U.S. waterways support designated uses such as swimming, fishing, and protection of aquatic life. During

---

19 USDA, Natural Resources Conservation Service, Water Quality and Agriculture, Status, Conditions, and Trends 2-5 (1997).

20 *See, generally*, Natural Resources Conservation Service, U.S. Department of Agriculture, USDA Conservation Programs, available at *http://www.nrcs.usda.gov/NRCSProg.html* (last visited March 5, 2002).

that time reported impairment of U.S. rivers has remained between 35%-38%; and lake impairment ranged from 38% to 45%.[21] Moreover, those biennial reports continue to identify agriculture as a principal source of impairment.

The most recent comprehensive information on agriculture and water quality is based on ongoing studies completed by the U.S. Geological Survey ("USGS") in 1998 under the National Water Quality Assessment (NAWQA) Program.[22] This information confirms that, while progress has been made for some agricultural contaminants[23] and in some areas, agricultural water pollution remains a serious problem nationally. The summary analysis of these studies found:

- The EPA drinking water standard for nitrate continues to be exceeded in a significant number of shallow groundwater samples underlying intensive agricultural areas.
- Concentrations of nitrogen and phosphorus in surface waters frequently exceed levels that contribute to excessive growth of algae and other nuisance aquatic plants. USGS estimated that about 90 percent of nitrogen and 75 percent of phosphorus originates from nonpoint sources. Thus, while the 1997 USDA study discussed above reported declines in phosphorus concentrations, three fourths of streams in agricultural areas contained phosphorus at levels higher than EPA's goals for controlling nuisance plant growth.
- At least one pesticide was found in almost every water and fish sample collected from streams, and in over one half of the samples from shallow wells. Where pesticides were detected, almost every sample contained two or more pesticides. While those levels rarely exceeded EPA drinking water samples, over a half of all samples exceeded aquatic life protection guidelines, and USGS cautioned that no standards exist for many pesticides and that existing standards fail to address many health effects, such as effects on reproductive, nervous, and immune systems as well as endocrine disruption.

In sum, the USGS report found:

> Progress in cleaning up contamination from point sources has not yet been matched by control of contaminated runoff from nonpoint sources, including fertilizers and pesticides applied

---

[21] *Sustainable Future, supra* note 7, at 10178 (*citing* EPA's 1992, 1994, 1996, and 1998 National Water Quality Inventories).

[22] U.S. DEPARTMENT OF THE INTERIOR, U.S. GEOLOGICAL SURVEY CIRCULAR 1225, THE QUALITY OF OUR NATION'S WATERS, NUTRIENTS AND PESTICIDES (1999).

[23] For example, concentrations of organochlorine pesticides such as DDT, dieldrin, and chlordane in fish and sediment have declined significantly because they are no longer used, but residues of these long-banned substances remain due to their persistence. Concentrations of other pesticides, however, such as acetochlor, have increased due to increased use. Similarly, atrazine was detected in over one fourth of ground water samples taken.

> in agricultural and urban areas, and nutrients from human and animal wastes. The challenges are great because nonpoint sources are ubiquitous yet highly variable causes of water-quality problems, making them difficult to control.[24]

Clearly, we face some major choices about where to go in the future with our agricultural water pollution control policies.

III. Agricultural Water Pollution: Assessing Alternative Futures

Predicting the future is always perilous, especially when dealing with a complex topic infused with scientific, political, economic and other sources of uncertainty. So I make no claim to the "accuracy" of the following predictions (although I am confident that most of them are at least reasonable prophecy), and I expect fully that my co-panelists will challenge them either mildly or vociferously. Rather, my intent is to set forth several possible futures as a focal point for discussion and as a way to compare alternative future policies. And again, each scenario is designed purposely to stimulate a response from at least one of my fellow panelists.

A. *Scenario 1 – The status quo (baseline scenario).*

Congress enacts no major change in federal law. The TMDL program continues to putter along without major changes and without imposing any mandatory controls on agricultural sources. CWA and USDA agricultural pollution programs follow their historical course, and continue to be largely voluntary and decentralized, and based generally on technical assistance, cost-sharing, and the good will of the agricultural community.

Predicted result: The *status quo* leads to the *status quo*. Some farmers will be good, if not better, stewards of the land, but many others will not. Many will dutifully follow recommended best management practices, others will not (and largely with no consequences for that failure), but even those practices will be insufficient to address the serious water quality problems caused by agricultural operations collectively. Water quality certainly will be better than if none of those practices were implemented, but not dramatically so – which is the lesson of the best available data we have on a national scale. Some watersheds will improve, in areas where there are serious, comprehensive watershed restoration plans that lead to real on-the-ground changes in farming and other practices. Other watersheds will remain as is due to the inconsistency in watershed pro-

[24] *Id.* at 2. *See also,* David Zaring, *Agriculture, Nonpoint Source Pollution, and Regulatory Control: The Clean Water Act's Bleak and Present Future*, 20 Harv. Envtl. L. Rev. 515 (1996).

grams on a national scale, either because they have no watershed-based efforts or because those efforts suffer from the "too many meetings and too little action" syndrome.

To accept this result, however, we must be willing to abandon–at least for a large percentage of our waterways–the principal goals of the Clean Water Act, to restore and maintain the physical, chemical, and biological integrity of the Nation's waters,[25] and to render all waters entirely safe and suitable for fishing, swimming, healthy aquatic life and other uses. Under this view we will simply make a societal decision that we have gone far enough under current law. Rivers no longer catch on fire. A large percentage of the most dangerous toxic pollutants have been eliminated from our waters through industrial point source controls, and we can continue to work on those issues through new and improved effluent guidelines and NPDES permits. The most serious problems with pathogens are gone. We no longer face serious outbreaks of typhoid or cholera, although Milwaukee's cryptosporidium outbreak and less dramatic but equally real examples of waterborne illnesses remain,[26] and we can continue to improve the sanitary health of our waters through improved sewage treatment systems. Certainly relative to much of the world our waters are reasonably safe and reasonably clean,[27] although admittedly far from natural. Indeed, from the perspective of aquatic ecosystem health and aquatic biodiversity, a large percentage of U.S. waterways are in serious trouble.[28]

Maybe the loftier aspirations of the Act, to restore the integrity of natural aquatic ecosystems on a nationwide basis, were simply unrealistic in a modern society in which we have so radically altered the surface of the land in both rural and urban areas. Under this view, unless we are willing to forego some of the comforts of modern life, we should just accept a cleaner but less than perfect water reality. If we accept this view, however, we should at least be honest and admit that we are willing to accept impaired waterways and significant reductions in aquatic bi-

---

25 33 U.S.C. § 1251(a).

26 *See Sustainable Future*, *supra* note 7, at 10179-80.

27 Thousands of people every day die from water-related diseases, and roughly half of all people in developing countries suffer from water-borne and food-borne illness. PETER H. GLEICK, THE WORLD'S WATER 2000-2001, 1 (2000).

28 *See Sustainable Future*, *supra* note 7, at 10180-82. A recent conservation assessment by the World Wildlife Fund-United States found that fresh water ecosystems in the North America are among the most threatened, and that "time is running out" because "the most special biological elements of these habitats may disappear forever." ROBERT A. ABELL, ET AL., FRESHWATER ECOSYSTEMS OF NORTH AMERICA, A CONSERVATION ASSESSMENT 1, 7 (2000). Of all major aquatic ecosystems in North America, this study found only a handful that could be labeled "relatively intact" or "relatively stable," with most assessed as "vulnerable," "endangered," or "critical". *Id.* at 59.

odiversity as one of the prices of a modern society. Let's stop pretending that we can have it both ways. While my main goal in this paper is to present and to contrast a range of options, I, for one, am not yet willing to give up in this way.

B. Scenario 2 – Treat all pollution sources equally.

For 30 years we have subjected industrial and municipal point sources to a strict and costly[29] set of technology-based effluent limitations, in some cases augmented by even stricter water quality-based controls, enforced by NPDES permits backed up by administrative, civil, and criminal sanctions. Somewhat more recently, runoff pollution from urban and industrial sources has been subjected to similar, even if less precise and less certain, but still enforceable water pollution control requirements. Those processes remain incomplete and imperfect,[30] and are often critiqued on economic efficiency and other theoretical grounds. Nevertheless, they are responsible for significant reductions in water pollution on a virtually nationwide scale,[31] and concomitant improvements in ambient water quality in many waters. So even if not the most theoretically-efficient method of pollution control, as measured by raw reductions in the amount of pollution released, uniform national effluent limitations have been one of the most effective programs under any of our pollution control laws.

The logical question, then, given the apparent failure of the less rigorous, less uniform, less mandatory, and less enforceable approach we have adopted to agricultural water pollution, is should we not follow suit and modify the technology-based approach to address agricultural sources of pollution as well?[32] Opponents of this suggestion argue tradi-

---

29 By 1989, federal, state, and local governments had invested over $128 billion in public sewage treatment facilities, and EPA currently estimates future needs (through 2016) of $140 billion, plus an additional $7.4 billion for municipal stormwater controls. Annual industrial control costs rose from $1.8 billion in 1973 to almost $5.9 billion in 1986, with total expenditures during this period in excess of $57 billion. *Sustainable Future*, *supra* note 7, at 10176-77. All told, since the early 1970s the private and public sectors combined have invested over $500 billion in water pollution control. *See supra* note 22, at 2.

30 *See* Consent Decree in *NRDC v. Reilly*, No. 89-2980 (D.D.C. Jan. 31, 1992); 33 U.S.C. § 1314(m).

31 About 75% of the U.S. population is now served by public sewage treatment plants. By the early 1990s industrial water pollution controls had reduced discharges by millions of tons of conventional pollutants and over a billion pounds of toxic pollutants per year. *See Sustainable Future*, *supra* note 7, at 10176-77.

32 One effort to design the equivalent of technology-based controls for agricultural pollution and other nonpoint sources under the Coastal Zone Management Act, 16 U.S.C. § 6217(g), was derailed politically and resulted in little more than a national set of best management practices manuals. *See* 20 YEARS LATER, *supra* note 8, at 191-93.

tionally that uniform controls are not appropriate for agricultural sources, which can vary widely based on crops, geography, topography, climate, soils, slopes, and other factors; that it is difficult to regulate tens of thousands of discrete landowners; that pollution tied to unpredictable precipitation cannot be curtailed as easily as is true for controllable production water; that land use practices are more appropriately and effectively regulated at the state and local levels; and that mandatory pollution controls would bankrupt U.S. agriculture.[33]

Perhaps, however, these long-assumed distinctions between agriculture and industry are overstated. Industrial sources, in fact, vary considerably based on products produced, production methods and processes, size, location, climate, and many other factors. Indeed, the quest for "uniform" national effluent limitations has been far more difficult and vastly more time-consuming than Congress or EPA envisioned in 1972. But while the road has been twisted and rocky at times, it has led us generally in the right direction. Variability among industrial pollution sources has been addressed through a considered, even if complex, system of industry categorization and subcategorization designed to address legitimate differences among facilities, augmented by a series of statutory and regulatory variance provisions to address more site-specific differences. The effluent guidelines program also faced predictions of economic doom, but those significant industrial changes have been accomplished thus far with no major national economic disruption, and in fact evidence indicates that those changes have enhanced rather than impaired the U.S. economy.[34]

Moreover, our technology-based program has been modified significantly to address runoff pollution from both urban and industrial sources.[35] Those pollution sources face many of the same challenges as agricultural runoff, such as variable weather; numerous, dispersed, and diverse sources; and difficulty in applying end-of-pipe controls. Yet those sources have been regulated through regional or facility-wide rather than outfall-specific permits; general and nationwide rather than individual permits; and identification of mandatory management practices rather than end-of-pipe numeric limits. A wide range of similar options are available for agricultural sources.[36] For example, farms or entire agricultural districts in the West that are linked by common or connected systems of irrigation delivery, drainage structures, and irrigation return flows–which are currently exempted by statute from NPDES con-

---

33 *Sustainable Future*, *supra* note 7, at 10184.

34 *See* U.S. EPA, LIQUID ASSETS 2000: AMERICA'S WATER RESOURCES AT A TURNING POINT (2000).

35 *See* 33 U.S.C. §1342(p); 40 C.F.R. §122.26 (2000).

36 *See*, *e.g.*, 60 Fed. Reg. 40230 (Aug. 7, 1995) (concerning urban stormwater "phase I" program).

trols[37]–could be permitted on a similar system-wide basis. Examples of control practices that might be imposed include mandatory soil testing prior to fertilizer application; conservation tillage; integrated pest management; minimum buffer strips; etc.; which could be applied universally but flexibly.

So what result might we predict from this alternative future? Clearly, we could expect no less difficult, complex, costly, and politically- and legally-charged a process of regulatory development as we have experienced with respect to industrial and stormwater controls over the past 30 years. (Although perhaps we have learned some lessons from those experiences that might ease the way.) Challenges include proper categorization of the agricultural industry, recognition of legitimate sources of variability, and development of fair but effective implementation and enforcement methods. The key question, however, is whether that pain will be worthwhile if they result in anything close to the systemic reductions in pollution loads that have resulted from analogous controls on municipal and industrial point sources.

C. *Scenario 3 – Apply TMDLs effectively to agricultural pollution.*

To date, the agricultural community has vehemently opposed application of TMDLs to nonpoint sources,[38] and in fact has challenged such applicability–so far without success–in court.[39] While no one ever wants to be subject to more regulation, I will take the admittedly provocative, but I think serious and legitimate, position that the agricultural community should *welcome* TMDLs as a mechanism to achieve our shared environmental goals in the most cost-effective ways possible. Indeed, when we have invested and continue to invest millions of dollars a year in both public and private dollars to agricultural conservation programs, does it not make sense to use a rational method of planning and analysis to ensure that those dollars are directed to those watersheds that are most impaired, and in ways most likely to address that impairment? As explained below, at least under current law TMDLs are the best tool we have available to achieve that result.

While water quality-based effluent limitations are written for individual point sources, at least in theory water quality standards are supposed to be implemented though a more holistic process, under which "total maximum daily loads" (TMDLs) are calculated for impaired waters and pollution control obligations are allocated among the various

---

37 33 U.S.C. §1362(14).

38 *See* Scott H. Reisch & Catherine M. van Heuven, *EPA's Final TMDL Rule: A Load of Trouble for Agriculture and Industry*, 30-MAY COLO. LAW. 75 (2001).

39 *See* infra note 47 and accompanying text.

sources of pollution within the watershed. In plain English, a TMDL[40] refers to the maximum amount of pollution a water body can take from all sources combined before it begins to exceed ambient water quality standards (WQS).[41] Thus, the WQS and TMDLs themselves do not define requirements for individual activities along a river. Rather, they define the collective requirements for all whose actions affect river's health. However, EPA regulations implementing the TMDL requirement also require states to allocate the maximum pollution loads among various sources of pollution, which in turn is used to drive pollution controls for individual sources or categories of sources.[42]

Unfortunately, the TMDL program has not met its full potential due to extensive delays and problems with program implementation.[43] Most states did little on their own to implement the TMDL program seriously, and EPA officials admitted that in the first two decades of CWA implementation they downplayed the WQS side of the statute, which required site-specific analysis in individual watersheds in favor of the nationally-focused technology-based program. As a result, the TMDL provisions of the Act thus lay dormant until, in the last few years, environmental groups began to sue to enforce this requirement of the law. This has resulted in court orders in many states, lawsuits pending in others, and notices of intent to sue in still other states.[44] For example, Idaho was forced to list almost 1,000 rivers for TMDLs and cleanup plans in the next decade. In 1999, EPA proposed widespread changes in its regulations designed to expedite and improve implementation of the TMDL program.[45]

Serious political controversy remains over TMDL program implementation, however, resulting in a political deadlock over changes in EPA's TMDL program regulations.[46] Among other controversies, states and others question whether the TMDL program requires states to de-

40 For a more complete description of the WQS and TMDL process, *see generally,* HOUCK, *supra* note 7; *Integrated Approaches*, *supra* note 7.

41 33 U.S.C. § 1313(c).

42 40 C.F.R. Pts. 130, 131 (2000).

43 *See* HOUCK, *supra* note 7; *Integrated Approaches*, *supra* note 7

44 *See Integrated Approaches*, *supra* note 7, at 205 n.14.

45 64 Fed. Reg. 46012 (Prepared Aug. 23, 1999) (proposed amendments to 40 C.F.R. Pt. 130); 64 Fed. Reg. 46058 (Prepared Aug. 23, 1999) (proposed amendments to 40 C.F.R. Pts. 122, 123, 124 and 131).

46 Following the recommendations of a federal advisory committee on TMDLs, on which the author served, U.S. EPA, REPORT OF THE FEDERAL ADVISORY COMMITTEE ON THE TOTAL MAXIMUM DAILY LOAD PROGRAM, EPA 100-R-98-006 (JULY 1998) EPA issued revised program regulations, only to have them stayed legislatively, challenged in court, and later withdrawn by the agency itself pending further program review. 66 Fed. Reg. 41,817 (Aug. 9, 2001). EPA has indicated that it plans to issue revised proposed regulations by the middle of this year, and to issue final rules before April, 2003.

velop and adopt integrated implementation plans. Similarly, farmers and others who generate nonpoint source pollution have challenged the legality of applying TMDLs to those forms of pollution. While one U.S. District Court confirmed the applicability of TMDLs to nonpoint sources, that decision is currently on appeal, and the issue was raised as well in the challenges to EPA's TMDL program regulations, which are now stayed pending EPA deliberations on how to revise those rules.[47] (While there is much speculation and discussion about the possible directions in which EPA is heading in those revisions, I prefer simply to wait for the final result before commenting.)

If EPA continues to support and the courts continue to uphold the applicability of TMDLs to nonpoint sources, however, they could be used to implement smarter and better-directed control of agricultural water pollution, without necessarily being as intrusive as under the national, technology-based option. Implementation of TMDLs is clearly more complex for nonpoint sources than for point sources.[48] Unlike analogous point source controls, the CWA does not expressly require the states or EPA to impose on nonpoint sources pollution specified types of controls, and contain no mechanisms similar to NPDES permits. Even EPA's now withdrawn regulations would only have required "reasonable assurances" that agricultural pollution controls would be implemented, with a flexible laundry list of acceptable means for states to do so. However, TMDLs can be used to identify those water bodies for which significant agricultural pollution contributes to violations of water quality standards, to identify the source and nature of those contributions, and to design and target those controls most likely to reduce those contributions by the proper amount. Most industrial dischargers would love to be bound only by those constraints, as compared to mandatory technology-based controls that they assail as "treatment for treatment's sake."

In short, TMDLs offer the agricultural community the chance to shed their longstanding image as being the largest remaining source of water pollution in the country and responsible for serious, widespread water quality problems and aquatic ecosystem impairment. And it could do so in ways that would be far less painful and far more flexible than other viable strategies. Why not embrace rather than oppose TMDLs?

D. Scenario 4 – Reevaluate and revise national agricultural policies.

In part to underscore the relatively conservative nature of the TMDL option, I will present this option very briefly, recognizing that there are many who are more knowledgeable and who have thought more seriously about agricultural reform than have I. All too often we

---

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

48 *See Integrated Approaches*, *supra* note 8.

struggle with superficial remedies that fail to consider the root causes of environmental problems–the structural problems.[49] Many have argued that is true for agricultural water pollution. If we want to compare real policy choices fairly, then, and to decide which course will be most effective relative to the costs of those policies, it is only fair to consider major structural and institutional solutions as well. Under this view, maybe none of the above scenarios will succeed so long as national farm policies and western water policies continue to promote surplus crop production, excessive use of agricultural chemicals, and farming on wetlands, steep slopes, erosive soils, and other environmentally-sensitive areas. Instead of "end-of-field" or "on-farm" controls, remedies would involve changes to federal crop subsidies, price supports, and similar economic policies.

Opponents of such reform will argue that those economic policies, many of which were born out of dire necessity during the Great Depression, remain necessary to support the cheapest and most plentiful supplies of food and fiber in the world, and to assure an equitable distribution of those goods at affordable prices, especially to lower income citizens. Maybe so. Or maybe, from a macroeconomic perspective, we pay far too little for agricultural products because of our subsidies and other policies. Maybe the price of food and fiber has, for far too long, failed to reflect the external environmental and other costs of production, resulting in far too little incentive for changes that would reduce those externalities. And maybe agricultural policies are not, therefore, the most efficient and effective ways to address economic disparities, as opposed to more direct forms of assistance such as increased food stamps or revisions in eligibility cutoffs for that assistance.

IV. Conclusion

Obviously, I intend the alternative scenarios presented above to provoke almost everyone – the agricultural sector, the environmental community, our political leaders and the agencies. Existing agricultural water control programs and policies present a series of provocative questions:

1. The agricultural community has been asking us to trust them to do the right thing voluntarily for 30 years now and it has not worked. Why should we trust them any more now?

2. Why is it fair that industrial sources of water pollution have been subjected to such stringent controls and responsibilities and to such extreme expenses when agricultural pollution sources not only are spared those expenses but are also subsidized to produce pollution and provided

[49] *See* J. Clarence Davies & Jan Mazurek, Pollution Control in the United States, Evaluating the System 247-48 (1998).

governmental assistance for many of the control practices you do implement?

3. Is it fair to tell the users of our waterways that they should continue to drink unsafe water, swim in unsafe water, consume unsafe fish and wildlife, and abandon our aspirations for healthy aquatic ecosystems just to preserve your sense of independence?

4. If we are going to continue to invest billions of dollars in agricultural subsidies and in agricultural conservation programs, don't we have an obligation to spend those dollars more wisely by adopting some mechanism for more targeted approaches?

Assuming that the *status quo* is unacceptable, which of the brands of medicine offered above are preferable to answer these questions and to make progress toward the elusive goal of reducing agricultural pollution: technology-based controls (invasive surgery), TMDLs and related programs (long-term physical therapy), or major changes in national agricultural policies (holistic medicine). If none of the above, I challenge others to suggest what other forms of treatment would be superior to those offered.