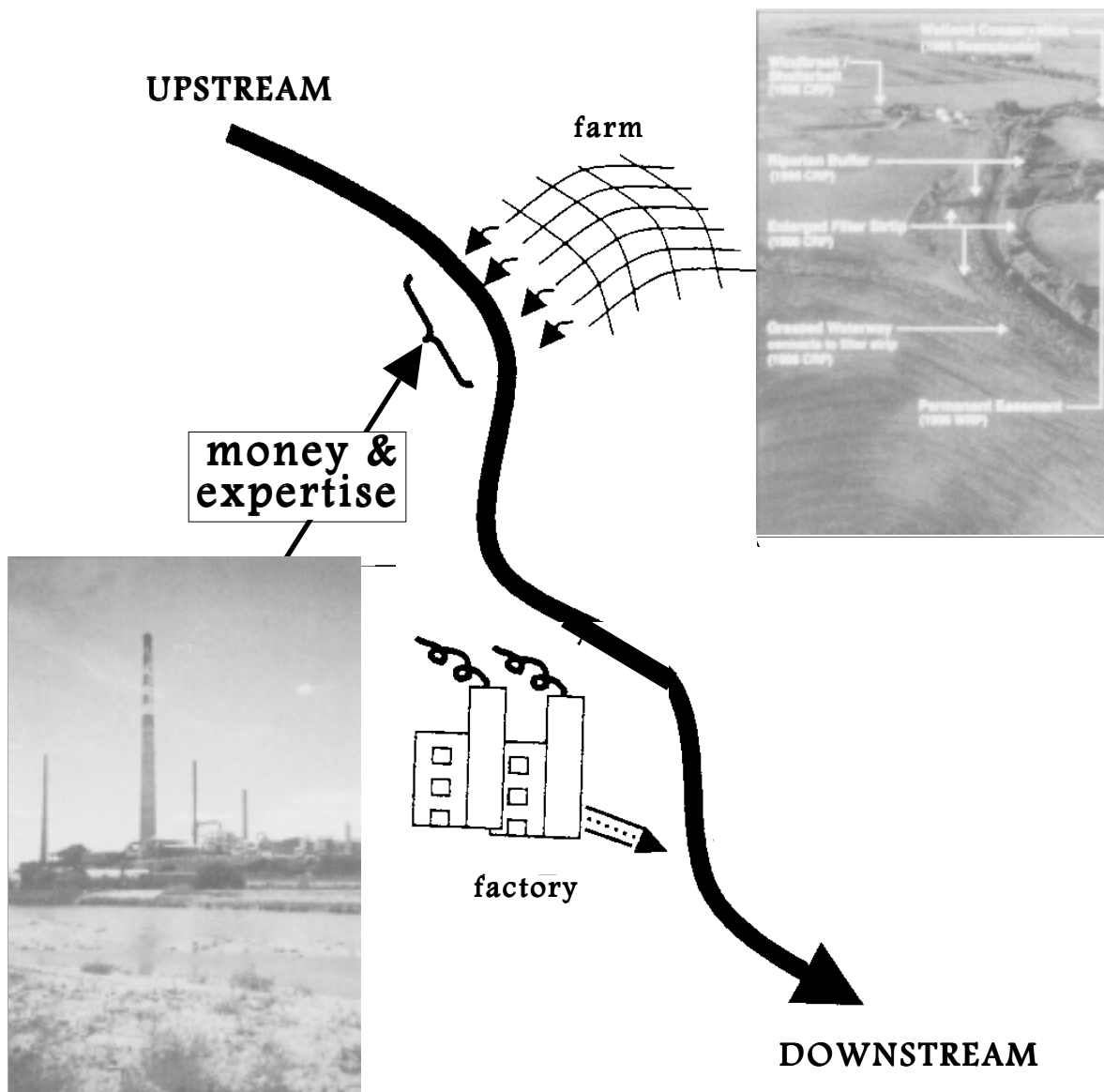


A New Tool for Water Quality

MAKING WATERSHED-BASED TRADING WORK FOR YOU



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TRADING WORK FOR YOU

National Wildlife Federation

June, 1999

PREFACE

As we enter a new century, it's appropriate to think about how far we have come in cleaning up America's polluted waterways, how much further we still have to go, and the role that each of us must play to get the job done.

The burning of the polluted Cuyahoga River in Cleveland, Ohio thirty years ago provided a wake-up call that led to notable progress in stemming the pollution discharges from factories and wastewater treatment plants. Yet the job of making our waterways safe for people and wildlife is far from done.

More than half of our nation's 2000 watersheds remain polluted, principally due to runoff from city streets, farm fields, grazing lands, development sites, and timber harvesting areas. Pollutants discharged into the air continue to find their way into our waterways with every rainfall, creating a significant threat to public health and the environment.

Addressing these so-called "nonpoint sources" of pollution will take perseverance and political will; both must start with the commitment of concerned citizens. That's where this guide comes in.

Across the country states are considering watershed-based trading as a new approach to cleaning up waterways. To become involved and to make sure the proposals do what they purport to do, citizens must understand what trading is, review trading proposals, identify problem areas that could weaken the Clean Water Act's effectiveness, and demand the necessary changes to make trades work. This guide can provide the information and understanding you need to tackle those important tasks. With this guide, you can help make this innovative approach a valuable tool for common-sense conservation.

The guide is part of the National Wildlife Federation's ongoing commitment to protecting America's watersheds and making all our waters "fishable and swimmable." Please, get involved! Use the guide to help protect and restore the waterways you know and love. With your help, we can take the next step in eliminating the dangers of water pollution to people and wildlife alike; we can have clean waters and a brighter future. Together, we can make it happen.



Mark Van Putten
President

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Introduction to Watershed-based Trading

- *What is “watershed-based trading?”*
- *Is watershed-based trading being proposed in your watershed?*
- *Are you wondering what exactly is being traded?*
- *Is trading the right tool to make your local river or lake cleaner for public uses, fish, and other wildlife?*

This guide will answer these and other questions, so read on! The guide will also help you decide whether watershed-based trading is an appropriate cleanup strategy for your watershed.

Watershed-based trading (trading) is a fairly new strategy to clean up a watershed’s problem pollutants—pollutants found in waters at concentrations high enough to cause harm to human health, fish, or other wildlife or interfere with public uses like fishing and boating. Phosphorus, a nutrient pollution found in runoff, is an example of a problem pollutant. Too much phosphorus causes algae blooms that can kill fish and pose health risks to people.

Trading allows a pollution source (like a factory or waste water treatment facility) to buy controls that will reduce the amount of a problem pollutant elsewhere in the watershed or drainage basin. By buying such controls, the factory does not need to install tighter controls to lower the discharge of that pollutant from his or her own plant. Parties involved in the trade want to either: (a) trade directly with each other; or (b) create a market of “credits” that represent a specific amount of pollutant reduction, as is currently done with trading air emission reductions.

The intent of trading is to achieve expected reductions of a particular pollutant at a lower cost. If trading can deliver cost savings while achieving the same water quality improvement as required under the traditional regulatory approach, then public agencies should try it. Establishing pilot projects could help determine how successful this approach can be. However, the challenge with trading is to allow for innovative, market-based reforms without compromising the existing safeguards in environmental protection.

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The Clean Water Act’s (CWA) goals are to eliminate discharge of pollutants and to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters,” with an interim goal that provides for “the protection and propagation of fish, shellfish and wildlife and provides for recreation...”¹ Trading is being touted, particularly by municipal and industrial wastewater dischargers, as a flexible and therefore cost-effective alternative for meeting the CWA’s goals.

¹ Making waters safe for fish, wildlife, and recreation as the nation works towards eliminating all discharges of pollutants into navigable waters is often referred to as the CWA’s “fishable and swimmable” goals. Section 101(a); 33 U.S.C. Section 1251(a).

Two categories of pollution sources are:

- Sources that discharge from a defined route, such as a pipe (called “*point sources*”). Industries and sewage treatment plants fall under this category. These sources require a discharge permit under the National Pollutant Discharge Elimination System (NPDES) before discharging pollutants;² and,
- Sources whose discharge is diffuse (called “*nonpoint sources*”). Nonpoint source pollution enters a river or lake as runoff from a wide geographic area. Examples include air deposition of contaminants and polluted runoff from agricultural fields, rangelands, urban and suburban areas, and timber harvesting sites.

Despite the progress we’ve made over the last 25 years under the CWA to curb pollution, more than half of our nation’s 2000 major watersheds remain polluted, primarily due to nonpoint source pollution.³ See Table 1 for a list of the major nonpoint pollution sources. This guide will focus primarily on trading that involves nonpoint sources.

More than half of our nation’s 2,000 major watersheds remain polluted, primarily due to nonpoint source pollution.

Achieving real water quality improvements is dependent on the *actual design* of the trading program. The U.S. Environmental Protection Agency (EPA) provides some guidance, with its release of a draft framework in 1996.⁴ However, the U.S. EPA framework is in draft form. The U.S. EPA has not indicated whether they plan to release the framework in final form. Although it is likely that some states are using the draft framework to guide the development of their trading policies, other states may not.

Achieving water quality improvements through trading also depends upon citizen involvement. The “watershed initiative” describes the growing public interest to become involved in local and state decisions that affect the rivers, lakes, estuaries, and coastlines that people care about and to take action to protect them.

Trading can be a useful tool for enhancing water quality where you live, provided that you look out for specific pitfalls, and get involved early in trading proposals in your state or watershed. Your job is to ensure that any proposed trade will restore the waters you care about. This guide is designed to assist you by answering questions commonly asked and outlining the conditions or “safeguards” under which a trade can take place.

² NPDES permits specify the conditions of discharge, which often include monitoring, and require renewal every five years. CWA Sections 301 and 402; U.S.C.A. Sections 1311 and 1342.

³ U.S. Environmental Protection Agency, *National Water Quality Inventory 1996 Report to Congress*.

⁴ U.S. EPA. *Draft Framework for Watershed-Based Trading*. May 1996.

Table 1. Major Sources of Nonpoint Source Pollution

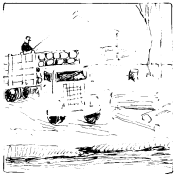
AGRICULTURAL FIELDS AND GRAZING LAND:



Runoff carries manure, fertilizers, pesticides, and sediments into adjacent water bodies or groundwater. Agricultural runoff has been identified as one of the leading causes of water pollution today.

Excessive nutrient pollution causes algae blooms which are harmful for aquatic life and could cause public health risks. In addition, more than a billion tons of eroded soil from farm fields are estimated to run off into coastal waters every year.

LOGGING: Logging without using effective soil protection practices will lead to increases in erosion. Water, running over bare and unprotected land, picks up loose soils. The soil particles, suspended in the water, increase cloudiness (called "turbidity"),

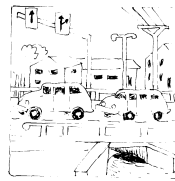


lowers the oxygen supply in streams, rivers, and lakes, and becomes deposited as sediment. High sediment loadings clog fish gills and disrupt fish spawning beds and aquatic insect habitat. Loss of shading increases water temperature which also causes drastic impacts to stream ecology.

ROAD AND BUILDING CONSTRUCTION SITES: Road and building construction sites with poor erosion controls cause large amounts of soil to enter local waterways.



ROADS AND PARKING LOTS: Runoff on these



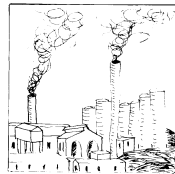
impermeable surfaces washes away toxins such as oil, antifreeze and other automobile fluids into the nearest storm drain which are typically discharged into the nearest water body.

LAWNS AND GOLF COURSES: Fertilizers, pesticides,



and other chemicals, applied regularly to heavily landscaped areas, may leach into nearby streams, wetlands, and groundwater, especially during periods of heavy rains or over-watering.

SMOKESTACKS AND CAR EXHAUST: Power plants,



incinerators, automobiles, and other industries that release air emissions can cause fallout of pollutants, like toxins and nitrates.

DAMS AND LEVIES: Dams, levies, channelization, and culverts alter the natural streamflow and affect water temperature, impairing in-stream and streambank habitat.



Trading can be a useful tool for enhancing water quality where you live, provided that you look out for specific pitfalls, and you get involved early in trading proposals in your state or watershed to argue for water quality safeguards.



Questions and Answers About Trading

The following questions and answers should help you get a better understanding of trading and why public officials are looking closely at trading as a means to limit nonpoint source pollution:

Q: *What is watershed-based trading?*

A: Trading is one strategy to reduce problem pollutants in our rivers, lakes, estuaries, and coastlines. Trading allows a wastewater treatment plant, factory, or other plants that discharge waste into a river or lake (a “discharger”) to purchase controls of a particular pollutant elsewhere in the watershed, instead of installing tighter controls for that pollutant at his or her own plant.

Q: *Why is it called “watershed-based” trading?*

A: Trading (sometimes called “effluent trading” or “pollutant offsets”) are “watershed-based,” meaning that trading can occur between pollutant sources—like industry dischargers and land use activities causing runoff—within a given watershed or drainage basin.

Q: *Who is doing the trading?*

A: As Table 2 demonstrates, trades occurs between different sources of the same pollutant in the same watershed. Much of the concerns about watershed-based trading involve trades between point source dischargers and nonpoint sources.

Q: *Why would pollution sources want to trade?*

A: Trading can save dischargers money. The intent is to achieve expected reductions of a problem pollutant at a lower cost. A source would pay another source to pollute less of a problem pollutant instead of installing tighter (and more costly) controls to lower his or her own discharge.

The intent [of trading] is to achieve expected reductions of a problem pollutant at a lower cost.

Q: *Why is trading being considered by regulatory authorities?*

A: Unlike the permitting process to control pollution from point source dischargers like factories and waste water treatment facilities, there is no federal, permit-based regulatory program to control nonpoint source pollution.

The only federal program that requires states to restore polluted waters regardless of the source is the CWA’s Total Maximum Daily Load (TMDL) watershed restoration provision (Section 303(d)).⁵ The TMDL provision requires states to

⁵ See, Dolan, Kari and Cameron Davis. *Saving Our Watersheds: A Field Guide to Watershed Restoration Using TMDLs*, National Wildlife Federation, January 1998, for an in depth look at TMDLs and how you can use them to improve water quality in your watershed.

distribute pollutant reduction responsibilities among all sources, point and nonpoint sources alike. The TMDL provision applies to all waters that do not meet or are not expected to meet water quality standards even after technology-based controls are in place. The provision requires the development of a TMDL restoration plan for each pollutant of concern (although a single TMDL can address multiple pollutants.) The TMDL provides an opportunity to secure nonpoint source controls because the U.S. EPA cannot approve a proposed TMDL unless the state can demonstrate that there is a “reasonable assurance” that the controls can be achieved. If states cannot provide this assurance, the entire load reduction must be assigned to point sources.

The U.S. EPA and a number of states are considering trading as a cost-effective strategy to achieve pollutant reductions required by the TMDL process. Industry and waste water treatment plants are also particularly interested in trading because it could save them money in implementing pollutant reductions. (For more discussion of TMDLs, refer to the “Trading Checklist” chapter on page 16.)⁷

Table 2: Different Types of Trades

POINT-TO-POINT TRADING: A point source (usually either a sewage treatment plant or industrial facility) pays for another point source in a watershed to undertake greater-than-required controls instead of upgrading its own treatment. All conditions of the trade are incorporated in the point sources’ discharge permits, where monitoring and enforcement procedures are specified. Therefore, such trades can be easily enforced.

INTRA-PLANT TRADING. A single plant allocates pollutant discharges among its outfalls or discharge points. Like point source trades, intra-plant trades are easily monitored and enforced.

PRETREATMENT TRADING: An industrial facility that discharges to a sewage treatment plant arranges for greater reduction by other dischargers to that same treatment plant.

POINT SOURCE-TO-NONPOINT SOURCE TRADING: A point source installs nonpoint source pollution controls, like buffer strips along the river or manure storage structures, in a watershed. This arrangement is the most common type of trade currently being proposed. For example, a sewage treatment plant needs to reduce its discharge of a problem pollutant because the river receiving the discharge is impaired. Rather than installing expensive treatment equipment, the discharger pays for controls to reduce the problem pollutant at a nonpoint source elsewhere in the watershed. To account for the uncertain effectiveness of nonpoint source controls, trades need to require a trading ratio greater than 2:1.⁶ The responsibility to achieve the required pollutant reductions should fall onto the point source.

NONPOINT SOURCE-TO-NONPOINT SOURCE TRADING: A nonpoint source pays for more cost-effective controls of polluted runoff elsewhere in a watershed. The incentive to trade is due to the stricter controls that newer sources in a watershed may face.

⁶ A 2:1 trading ratio means that reducing two units of a problem pollutant from a nonpoint source is necessary to offset one unit of pollutant reduction from a point source. A trading ratio is essential to any trade due to the uncertainty over the effectiveness of nonpoint source pollution controls. The trading ratio is designed to eliminate greater amounts of the problem pollutant from the participating nonpoint sources than pollutant reductions that otherwise would have been required at the point source. See discussion of trading ratios in the chapter, “Trading Checklist,” on page 21.

⁷ Another CWA program addressing nonpoint source pollution program is Section 319. However, it is essentially voluntary in nature. Section 319 requires states to prepare and implement a nonpoint source management plan that identifies categories of pollution sources and measures to reduce pollution. The U.S. EPA provides partial federal funding to implement such measures.

Trading is also seen as an incentive-based approach for securing tighter controls on nonpoint sources. Although nonpoint sources remain today's greatest threat to water quality, the U.S. Congress has yet to demonstrate the political will to regulate such sources. States probably will not adopt rigorous control programs. Many states fear that requiring controls may put their agricultural businesses at a competitive disadvantage (in comparison with those businesses in other states), put smaller farms out of business, and discourage commercial and industrial development.⁸

Q: How does trading work?

A: A pollution source will want to trade if: (a) the source is required to reduce its discharge of a particular pollutant as part of a TMDL, because the river or lake is already polluted; or, (b) the source needs to increase its discharge (as in the case of a facility expansion), and therefore, is looking to offset the additional discharge with reductions elsewhere in the watershed.

For example, a municipal waste water treatment plant, instead of installing tighter phosphorus pollution controls, would pay for less expensive phosphorus removal practices elsewhere in the watershed. The incentive to trade is particularly great when there is a significant difference in the cost of controlling pollutants among the different sources. (Refer to the "Trading Checklist" chapter on page 13 for more discussion of TMDLs.)

Some conditions for a trade include: (a) the ability to measure the problem pollutant with monitoring; (b) the availability of several control technologies or methods; (c) the identification of more than one source discharging the problem pollutant in the same watershed; and (d) the assurance that trading would not cause adverse environmental impacts, such as the creation of "hot spots" or highly degraded localized areas in the stream or lake.

Q: What would a trade look like?

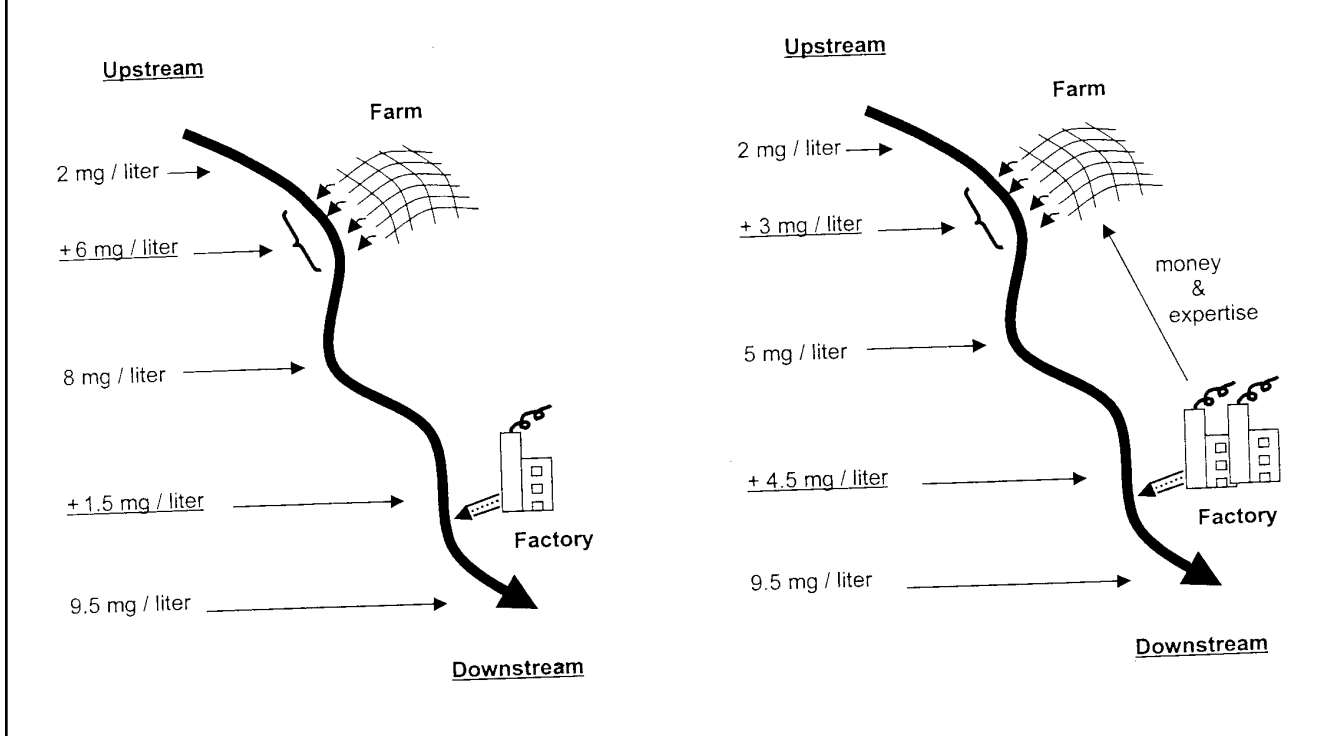
A: See Figure 1. This diagram shows the concentrations of Pollutant X along the river before and after the trade.⁹ The river meets water quality standards of 10 milligrams per liter (mg/l) for Pollutant X. However, downstream of the factory, the Pollutant X concentration is 9.5 mg/l, nearly equal to the standard. The river's assimilative capacity—the amount of a particular pollutant a water body can absorb while still remaining healthy—is almost entirely used up. The factory cannot increase its discharge of Pollutant X without violating the water quality standard.

The factory wishes to expand. Factory expansion would increase its discharge from 1.5 mg/l to 4.5 mg/l, an increase of 3 mg/l. Therefore, the factory purchases nonpoint source controls at the farm located upstream of its plant. The controls reduce the concentration of Pollutant X downstream of the farm and are enough to allow for the expansion.

⁸ Sax, Joseph, Robert Abrams, and Barton Thompson, ed., *Legal Control of Water Resources*, Second Edition, 1991 at 948.

⁹ To keep the example simple, the pollutant reduction target is based on concentrations of the pollutant (the measurement for the water quality standard) instead of pounds per day (the measurement of the discharge that is reflected in the point source's discharge permit). This example also does not discuss trading ratios, an essential component of any trading program, particularly if it involves nonpoint source controls.

Figure 1: Effects of Trading of Pollutant “X” on Stream Concentrations



The benefits in this example are: (a) improved water quality of the reach of the river between the farm and the factory; and, (b) efficiency in achieving necessary pollutant reductions. (It is important to be aware that the nonpoint source controls have a greater water quality benefit if they are installed close and upstream to the point source buying the controls.)

Q: What are the benefits of trading as an alternative to current water quality regulations?

A: Advocates of trading claim that it's a "win-win" solution because everyone benefits—the pollution source that buys controls is saving money, the source that receives payment is making money, and the water pollution problem is ameliorated. Moreover, advocates of trading also emphasize that this strategy provides participants flexibility in how and where they reduce pollution and what technologies they implement. Table 3 outlines a number of reasons why the U.S. EPA and some states are promoting trading as an effective strategy for cleaning up polluted waterways.

Q: What problems should we watch out for as we enter into discussions about trading?

A: Table 4 identifies three primary problems with watershed-based trading. Also, see the discussion on "enforceability" on page 17 in the next chapter entitled, "Trading Checklist: Key Elements of Successful Trades."

Table 3: Benefits of Watershed-based Trading

COST SAVINGS. Advocates of trading emphasize that this strategy is an efficient, cost-effective way to reduce pollution in a watershed, compared to traditional regulatory approaches. Trading allows dischargers flexibility in how they will reduce pollution loads. Thus, trading should theoretically cost dischargers less to lower the discharge of a pollutant in that watershed. For a municipality, trading could result in lower sewage treatment bills, and for an industry, trading may translate into less expensive products.

INCENTIVE TO REDUCE POLLUTION BEYOND CURRENT LIMITS. Trading may lower overall pollution loads in a watershed. For example, a source receives credits by voluntarily reducing pollution loads. The source can then sell those credits. The sources that would want to buy the credits are those that cannot inexpensively reduce their own pollution loads. Thus, the ability to receive and sell pollution reduction credits becomes a financial incentive to reduce pollution as much as possible. Conceptually, the result may be a cleaner stream beyond what was required before the trade.¹⁰ *In fact, trading should only be considered if the overall pollution load is reduced in the watershed.*

INCENTIVE FOR TECHNOLOGICAL INNOVATION. As described in Benefit #2 above, dischargers, receiving credit for reducing their loads, can sell that credit to other dischargers. They also need adequate monitoring techniques to demonstrate pollutant reductions. Thus, trading can provide an incentive for dischargers to explore ways and possibly invent new technologies to reduce pollution and monitor effectiveness of controls.

WATER QUALITY EMPHASIS. Trading emphasizes meeting water quality outcomes rather than the installation of a particular type of control technology. Dischargers have the flexibility to use a range of pollution control options, as long as they meet the goals and requirements of the CWA. Regulators also have the opportunity to address a greater range of pollutant sources to achieve water quality standards.

INDEPENDENT GROUPS CAN PARTICIPATE. Trading programs may be designed to allow watershed groups the opportunity to purchase and retire pollutant discharge credits, lowering the overall level of water pollution beyond the original water quality objective.

Q: Should I argue against any trading program being proposed for my watershed?

A: As mentioned above, the design of the trading program will determine whether the proposal has a high likelihood of achieving real water quality improvements. The “Trading Checklist” chapter on page 13, describes the essential components of any trading program and potential pitfalls to watch out for.

The design of the trading program will determine whether the proposal has a high likelihood of achieving real water quality improvements.

¹⁰ Crutchfield, S. and D. Letson. “Feasibility of point-nonpoint source trading for managing agricultural pollutant loadings to coastal waters.” 1994. *Water Resources Research*, Vol. 30, No. 10, p. 2826.

One very important consideration that must be the basis of any trade is the *pollutant cap* (the TMDL). The total amount of a particular pollutant entering a river or lake (including point source discharges that are regulated by permits as well as nonpoint source runoff) must be based on the river or lake’s capacity to safely absorb or assimilate the pollution loading. The assimilative or carrying capacity is used to establish a pollutant cap—a ceiling on the amount of a pollutant allowed to enter a river or lake. Without a cap based on the ability of the stream to accept the pollutant, discharges into the river or lake will likely lead to further water quality degradation.

Table 4: Problems with Watershed-Based Trading

ENFORCEABILITY. The CWA’s TMDL watershed restoration provision requires states to identify waters impaired by all types of pollution, including polluted runoff, and to develop restoration plans for them. However, unlike the NPDES permitting program for point source controls, the CWA contains no federally enforceable, permit-based program to secure nonpoint source controls. While point source controls are enforceable through federal citizen suits, nonpoint source controls are not.

MONITORING. Monitoring is essential to ensure that the projected reductions in pollution are in fact achieved. Point sources are required to self-monitor their discharge and self-report, with criminal penalties for false monitoring. This process creates a clear trail showing compliance or violation. No such monitoring is legally required for nonpoint sources. Moreover, monitoring nonpoint sources is much more difficult and costly.

EQUITY AND ENVIRONMENTAL JUSTICE. There is legitimate concern that trading proposals, especially those that allow an increase in discharges in one location, will continue to shift the burden of pollution from wealthy communities onto poorer communities. This problem can be avoided by making sure that the public is fully informed and involved in decisions affecting these proposals. You may need to reach out to potentially affected communities to make sure they are included in the discussion.

“HOT SPOTS.” A trading program, if designed poorly, may lead to the formation of “hot spots” or highly degraded localized areas in the watershed. For example, a point source discharger wishes to increase its pollutant discharge and therefore installs management practices downstream of its facility. The trading program may improve the watershed’s overall water quality, but the water quality along the stretch of river downstream of the discharger will potentially worsen. Thus, the trading program must be designed to avoid hot spots by considering location of potential trading partners within the watershed, size of watershed where trading can occur, the compliance records of potential trading participants, enforcement, and monitoring.



Water Pollution Control Efforts

Current Water Quality Protection

The CWA establishes a regulatory framework to protect water quality. It relies on a two-system approach to control pollution: technology-based controls and water quality-based controls. The CWA requires most point source dischargers to obtain a NPDES discharge permit. The permit requires having certain technologies in place to control specific pollutants. Water quality-based controls are an additional requirement that go further by ensuring that the combined pollution from all sources—point and nonpoint sources alike—do not impair certain water quality characteristics, like dissolved oxygen levels and water clarity.

Pollution from point sources is easier to control than nonpoint source pollution, since they discharge into receiving waters via a defined route such as a pipe. Therefore, regulators have been focused on technology-based controls for point sources over the past 25 years under CWA. States have made significant progress in reducing point source pollution through the use of a discharge permit program.

Nonpoint source pollution is today's principle cause of watershed degradation. Currently, however, there is no federal permit-based regulation, and limited state regulation, to curb pollution from nonpoint sources.¹¹

There are limited controls because nonpoint sources: (a) are diffuse, making them more difficult to identify and control; (b) are diverse in type of source, as demonstrated on Table 1. This diversity implies the need for a separate set of controls for each type of nonpoint source; and, (c) appear to be caused by local land use decisions, which traditionally has been the responsibility of local officials. Because of these reasons, the U.S. Congress has yet to demonstrate the political will to regulate such sources.

Nonpoint sources are logical targets for future pollution reduction efforts using trading because:

- Nonpoint sources are the principle cause for today's chronic water quality problems;
- Much of the easier and cheaper pollution controls at the point sources have been implemented. In some situations, installing more stringent controls at the point sources is more expensive than controlling pollution at the nonpoint sources (as in the case with controlling agricultural runoff.) The differences in control costs creates an opportunity for trading; and,
- Trading creates a financial incentive for nonpoint sources to participate in watershed restoration efforts.

¹¹ Environmental Law Institute. *Enforceable State Mechanisms for the Control of Nonpoint Source Water Pollution*. 1997. ELI project #970300.

Is Trading a Policy Tool for the Future?

The concept of trading is not new. Under the Clean Air Act Amendments of 1990 (CAAA), sources of sulfur dioxide have been trading their limits (or “allocation”) of air pollution emissions since 1995.¹² In the water pollution arena, the U.S. EPA is promoting trading as an alternative to typical regulatory approaches with its 1996 release of its draft framework. Although very few trades have actually occurred, there are numerous proposals and pilot projects for watershed-based trading across the U.S. (See Appendix A5.) It is likely that state officials will give trading greater consideration for a number of reasons:

- Section 303(d) of the Clean Water Act (CWA) requires states to list all polluted water bodies and to develop a “Total Maximum Daily Load” (TMDL) for each. States that are in the process of developing TMDLs for polluted rivers or lakes may look at trading as a way to meet the overall level of pollutant reductions for the nonpoint sources identified as part of the TMDL process. (See the “Trading Checklist” section on page 13 of this guide for further discussion of TMDLs and trading.)
- The U.S. EPA’s Federal Advisory Committee (FACA) recently released its report on the CWA’s TMDL provision.¹³ The U.S. EPA is expected to issue draft regulations based on the FACA report sometime in 1999. Under most circumstances, there is a ban on new discharges of problem pollutants into polluted waterways unless a TMDL is in place to account for the new discharges.¹⁴ The report recommends an exception to this ban if dischargers adopt trading as an alternative control strategy to improve water quality. For example, if a point source agrees to a trade, whereby it will pay for reductions of a problem pollutant at a nonpoint source and then actually achieves water quality improvements, the prohibition against new discharges in that watershed could be suspended. This approach would allow the point source to increase its discharge as part of the trade.

The [FACA] report recommends an exception to this ban [on new discharges of problem pollutants] if dischargers adopt trading as an alternative control strategy to improve water quality.

- In February 1998, the U.S. EPA and the U.S. Department of Agriculture (USDA) released a report detailing President Clinton’s Clean Water Initiative, a plan to spend an additional \$568 million for clean water programs.¹⁵ The Initiative promotes a watershed-wide approach to control pollution that goes beyond the historical focus on specific point sources by looking at all sources of water pollution. This Initiative looks at controlling nonpoint source pollution as a major objective, and trading programs as a means to meet that objective.¹⁶

¹² See Appendix 4 for a discussion of lessons learned from the Clean Air Act.

¹³ U.S. EPA. *Final Report of TMDL Federal Advisory Committee*. July 28, 1998. Section 3.4.

¹⁴ Section 303(d)(4) of CWA.

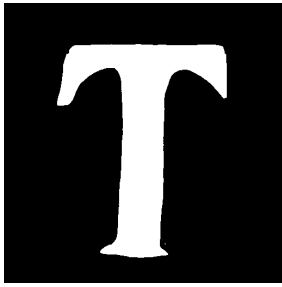
¹⁵ U.S. EPA and USDA. *Clean Water Action Plan: Restoring and Protecting America’s Waters*. 1998.

¹⁶ The Clean Water Action Plan calls for “Unified Watershed Assessments” (UWA) that identify and rank watershed quality. States that submit proposals for UWA receive federal monies for their voluntary nonpoint source control programs set up under Section 319 of CWA.

- Trading is also mentioned in the Coastal Zone Act Re-authorization Amendments of 1990 (CZARA, Section 6217). CZARA requires states that receive federal coastal zone funding to establish coastal nonpoint source pollution programs. Pollutant trading is listed as an alternative approach to controlling nonpoint sources.¹⁷ Trading is acceptable as an “alternative management measure” if states have conditions that make other Section 6217 guidance measures unsuitable.¹⁸
- Congressional staff are considering a number of bills that contain incentive-based strategies to address nonpoint source pollution. One concern is whether a proposed trade between a regulated point source and unregulated nonpoint source provides sufficient technical and legal mechanisms and appropriate authorities in place to verify and enforce the terms of the trade.

¹⁷ CZARA, Section 6217(g)(III.D.6).

¹⁸ Personal communication, Tim Eichenberg, Center for Marine Conservation, Washington, DC, September 1998. At the time of this report’s printing, 32 states have submitted plans for coastal nonpoint source pollution programs. However, none have incorporated trading as an alternative method.



Trading Checklist: Safeguards to Protect Water Quality

As mentioned earlier, a pollution source will want to trade if it needs to: (a) reduce its discharge of a particular pollutant because the river or lake is already polluted (and therefore, the trade becomes part of the TMDL process); or, (b) increase its discharge (as in the case of a facility expansion), and is looking to offset the added discharge with reductions elsewhere in the watershed.

Watershed-based trading, *if designed correctly*, has the potential to improve water quality and address the polluted runoff problem in a cost-effective manner. Safeguards must be in place to ensure that the proposed trading program will meet the goals of the CWA. The safeguards outlined in Table 5 below provide a framework for evaluating a trade so that it will reduce water pollution:

Table 5: Essential Safeguards for Any Watershed-Based Trading Program



TMDLS AS A PREREQUISITE. TMDLs provide the framework for a trading program by setting the overall level or cap of a problem pollutant and dividing reduction responsibilities among all sources;



GOOD COMPLIANCE RECORDS. Attention to dischargers' compliance records will help to ensure that trading partners abide by the reductions called for in a trading program;



POLLUTION LIMITS IN DISCHARGE PERMITS. Trading should be limited only to requirements that are imposed over-and-above the technology-based controls required for all dischargers of a similar type.



ENFORCEMENT. Trading's effectiveness at reducing pollutants that come from nonpoint sources in a watershed is dependent upon the selection, installation, monitoring, *and enforcement* of controls;



ADEQUATE TRADING RATIO. An adequate trading ratio (greater than 2:1) is essential to account for the uncertainty regarding the effectiveness of the pollution controls, particularly if the trading program attempts to secure pollution reductions using nonpoint source controls;



AVOIDANCE OF HOT SPOTS. A trading program must be designed in such a way to guard against the formation of "hot spots"—highly degraded localized areas in the watershed;



SUFFICIENT MONITORING. A good monitoring program will test the effectiveness of the pollution controls;



BAN ON CERTAIN TRADES. Proposals that avoid trading among different pollutants, across watersheds, and of toxic poisons will be more successful in improving the quality of the targeted river or lake segment;



U.S. EPA OVERSIGHT. U.S. EPA involvement assures continuity in trading programs across the country; and,



PUBLIC PARTICIPATION. Public involvement is absolutely crucial to the success of the trading program.

This section elaborates on each of these safeguards to help you evaluate proposed trades in your watershed or state.



Safeguard #1: TMDLs as a Prerequisite

One of the first steps in any watershed-based trading program should be the establishment of a pollutant cap or ceiling for a particular river or lake. The cap is the maximum amount of the pollutant that the water body can safely absorb while still meeting the federal and state water quality standards.¹⁹ The CWA's TMDL provision (found in Section 303(d)) establishes a process to determine: (a) the amount of the pollutant that the river or lake can safely absorb (also called the "assimilative capacity"); (b) the cap, based on assimilative capacity, for the pollutant to meet water quality standards; and, (c) how to divide up the pollution load reduction responsibilities among all point and nonpoint sources.

A TMDL can be thought of as a pie. The whole pie is the maximum amount of a pollutant allowed to enter a given water body while still meeting the state's water quality standards. Each slice of the pie represents the maximum amount of the pollutant each source may discharge. TMDLs should be developed with enough margin of safety to ensure that, once implemented, water quality standards will be achieved. If the river or lake fails to meet water quality standards for more than one pollutant, the state needs more than one pie.

States and tribes²⁰ are required to develop TMDLs for any water body that does not meet or is not expected to meet water quality standards even after technology-based controls are in place. Because TMDLs can protect public uses, fish, and wildlife of all waters, the CWA encourages states and tribes to develop TMDLs for all other waters, as well.²¹ TMDLs are particularly important for nonpoint source controls because of the absence of other mandatory control mechanisms under federal law. In order for the U.S. EPA to approve a proposed TMDL, the state must demonstrate that there is a "reasonable assurance" that the controls—on nonpoint and point sources alike—can be achieved.

States that are in the process of developing TMDLs for polluted rivers or lakes may look at trading as a way to meet the overall level of pollutant reductions for the nonpoint sources identified as part of the TMDL process.

Problem: TMDLs are required only for waters that do not meet water quality standards. However, a trade may be proposed: (a) in a healthy watershed that does not need a TMDL, or (b) for a water body that is not designated a high priority water for TMDL development and therefore, will not be targeted for TMDL development in the near term.²² In addition, for those water bodies that are

¹⁹ Water quality standards are rules, typically created by the state and approved by the U.S. EPA, that proscribe how clean water must be to achieve the goals and objectives of the CWA.

²⁰ The reference to states and tribes refers to those with designated authority by U.S. EPA to implement the Clean Water Act.

²¹ CWA Section 303(d)(3).

²² State agency officials implement their TMDL programs by first identifying all impaired waters and then prioritizing them according to severity of pollution and use. State officials develop TMDLs for the impaired waters, beginning with those designated as high priority waters. U.S. EPA, Pub. No. 440/4-91, *Guidance for Water Quality Based Decisions: The TMDL Process*. April 1991.

impaired, TMDL development alone may take as long as 10 to 12 years. Proponents of trading argue that some opportunities for trading may be lost if states must wait for TMDL development.

Your Solution: First, the TMDL process ensures that the pollutant cap is based on site-specific knowledge about the watershed's ability to absorb the pollutant of concern. This process is necessary if the proposed trading program is going to improve water quality. Don't accept a trading program that lacks a water quality goal or an understanding of assimilative capacity for the pollutant or concern.

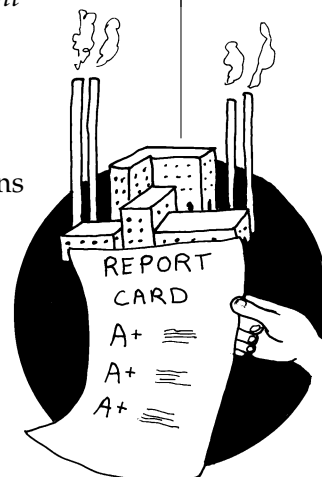
Second, a state is required to develop a TMDL for all impaired waters. If a trade is being proposed in a watershed near you that doesn't have a TMDL, and the water body doesn't meet water quality standards, demand that the state classify the water as "high priority" and target it for TMDL development. The TMDL needs to specify pollutant reductions necessary to achieve water quality standards.

Third, if a trade is being proposed for a water body that does meet standards, the trade must comply with the CWA's anti-degradation policy and the anti-degradation provisions in the State's water quality standards.²³ Demand that the trade have a higher ratio of 4:1 to prevent the worsening of water quality in rivers or lakes currently meeting water quality standards, a situation that would interfere with existing uses such as fishing and swimming. In addition, ask that the trading partners demonstrate compliance with the anti-degradation provisions by providing documentation of the required pollutant reductions.

Safeguard #2: Good Compliance Records

Most point sources are required to have discharge permits with conditions that are designed to control pollution. Those conditions place limits on the pollutant discharges. Unfortunately, there are numerous violations identified each year. Having a good record of compliance in meeting the terms of the permit, including effluent limits, is to assure the public that the proposed trade will not compromise the water quality.

Problem: A discharger (and potential trading partner) with a history of noncompliance erodes the public confidence that trading partners will follow the agreed-upon stipulations of the trade. The public should be particularly wary if the proposed trading program involves a discharger with a poor compliance record and an unregulated partner, such as a nonpoint source.



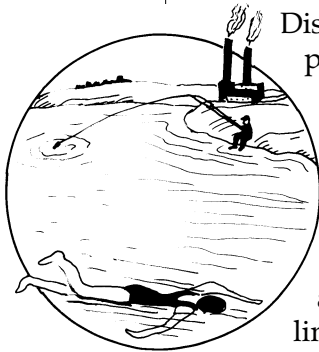
Having a good record of compliance in meeting the terms of the permit, including effluent limits, is essential to assure the public that the proposed trade will not compromise the water quality.

²³ If a water body is of high water quality, meeting or exceeding the minimum requirements (according to state or tribal standards) for specific pollutants, the CWA's "anti-degradation policy" is supposed to maintain that existing quality. The only exception is if one can demonstrate that the proposed polluting activity is necessary and presents important economic or social benefits to the community. The anti-degradation policy has three tiers: preserving existing beneficial uses, protecting existing water quality in fishable/swimmable waters, and protecting "Outstanding National Resource Waters." CWA Section 303; 40 C.F.R. Section 131.12; See, National Wildlife Federation, *Waters at Risk*. May 1992.

Under this kind of trade, the responsibility to achieve the required pollution reduction would fall onto the point source—the very discharger with a history of noncompliance!

Your Solution: *If a trade is being proposed in your watershed, ask your state agency or U.S. EPA regional representative about the trading partners' history of compliance for the proposed trade. Argue against approval for any proposed trade that includes sources with a history of non-compliance.*

Safeguard #3: Pollutant Limits in Discharge Permits



Discharge permits typically try to limit pollutant discharges by requiring point sources to install necessary technologies (appropriate for the industry type) and meet certain water quality conditions. Those limits are referred to as “effluent limits.” Thus, effluent limits establish a baseline level of protection that is intended to move us towards the CWA’s “fishable and swimmable” goals for all waters. As an example, those technology-based limits may not be sufficient to protect water quality for a particular river. Failing to meet water quality standards for a particular pollutant requires additional and possibly more expensive control technologies to further limit discharge of that pollutant.

Problem: Avoiding expensive technological improvements is a major incentive for point sources to seek trades. A discharger may attempt to get credit (or trade credits away) for improvements that it is already required to have in place. Proponents of trading argue that requiring particular control technologies reduces the incentive to trade.²⁴

Your Solution: *Fortunately, the U.S. EPA does not support this kind of proposal. The effluent limits are required by federal law as a starting point to control pollution.²⁵ Make sure that point sources are not getting credit for simply complying with law. All proposed trades must embrace the environmental goal to reduce pollution in the watershed. Argue that trading should be limited only to requirements that are imposed over-and-above the effluent limits that are required for all dischargers of that type.*

²⁴ Dave Batchelor, Michigan Department of Environmental Quality, personal communication, October 1998.

²⁵ CWA Section 306.

Safeguard #4: Enforcement

Trading's effectiveness at reducing pollutants that come from nonpoint sources in a watershed is dependent upon the selection, installation, monitoring, and enforcement of controls. Trading should be allowed only when the controls placed on participating sources are enforceable. Without enforceable controls, trading between a regulated point source and an unregulated nonpoint source means that states are sacrificing almost guaranteed pollution reductions by the point source in return for uncertain nonpoint source pollution reductions elsewhere.



Without enforceable controls, trading between a regulated point source and an unregulated nonpoint source means that states are sacrificing almost guaranteed pollution reductions by the point source in return for uncertain nonpoint source pollution reductions elsewhere.

Problem:

Some of the difficult enforcement problems associated with trading nonpoint sources include:

- Difficulty in Monitoring Nonpoint Sources. The success of the CWA in cleaning up point sources is in large measure due to the ease in monitoring those sources. Dischargers are required to self-monitor and self-report, with criminal penalties for false monitoring. This process creates a clear trail showing compliance or violation, even if the local, state or federal agency does little or no monitoring on its own.
- Lack of a Monitoring Requirement for Nonpoint Sources. The CWA has no monitoring requirement for nonpoint sources. As a practical matter, such monitoring is much more difficult and costly. Point sources simply monitor at their own discharge point. Nonpoint sources have no discharge point to monitor; they must monitor the entire stream segment and usually over longer periods of time to determine whether runoff controls are working.
- Inability to Use Citizen Suits as an Enforcement Mechanism. The CWA requires point sources to obtain discharge permits. Controls specified in these permits are enforceable through federal citizen suits. This means that if a point source violates its discharge permit, a private citizen can sue in federal court to compel compliance—even if the state or federal agencies do nothing. Such suits have been a critical deterrent to point sources violating their permits and have resulted in the Clean Water Act's having one of the highest compliance rate of any federal environmental statute.

In comparison, the CWA contains no similar provision to federally enforce nonpoint sources controls. The CWA encourages states to adopt polluted runoff management practices, but these programs are usually voluntary.²⁶ Most states deal with nonpoint source pollution problems through planning, technical assistance, publicly-funded cost-share incentives, and voluntary programs.²⁷

²⁶ CWA section 319.

²⁷ Environmental Law Institute. *Enforceable State Mechanisms for the Control of Nonpoint Source Water Pollution*. 1997. ELI project #970300, p. 56.

- Lack of the Political Will of States to Enact Enforceable Runoff Controls on their Own. Although it is acknowledged that some states have specific and enforceable laws about pollution discharges that might apply to nonpoint sources, those laws vary significantly from state to state in approach and enforcement of common water quality problems. Moreover, state laws often exempt practices like farming which are major sources of nonpoint pollution.²⁸ In fact, agriculture is the most widespread source of pollutants, introducing siltation, nutrient pollutants, pesticides, and organic matter that deplete oxygen in the waters.²⁹ It is likely that states will not adopt more rigorous control programs on their own, for fear that it may put their agricultural businesses at a competitive disadvantage (compared to those industries in other states), put smaller farms out of business, and discourage commercial and industrial development

***Your Solution:** Enforceable nonpoint source controls are necessary to assure the public that reduction targets for the problem pollutant will be met. Such controls will also reduce the competitiveness among states by requiring a consistent treatment of similar problems.*

Demand accountability. Require states to: (a) establish an enforcement authority for nonpoint controls; and, (b) incorporate nonpoint source controls into the point source discharger's NPDES discharge permit, making the discharger (and trading partner) responsible for achieving expected pollution reductions regardless of the source of pollution.

Placing nonpoint source controls directly into the permit is preferable because it attempts to address the monitoring and citizen enforcement problems raised above. It also makes the point source discharger legally responsible for achieving the pollutant reductions promised by the nonpoint source and for monitoring the nonpoint source to ensure that compliance is achieved. This process would use the proven enforceability of the point source NPDES permit to regulate nonpoint sources.

Placing nonpoint source controls directly into the [NPDES discharge] permit is preferable.

Dischargers may complain that these options discourage trading because of the liability associated with failing to achieve the necessary pollution reductions rests completely with the discharger.³⁰ Do not accept a compromise. The alternative is the increased risk of further water quality degradation due to lack of enforcement.

This solution has some weaknesses. To implement such a program, states would have to amend their statutes and change their administrative rules in very precise ways. Small compromises on the changes often mean large compromises on the enforceability of the program. In addition, be aware that not all conditions specified in NPDES permits are enforceable by citizen suits. Citizens can enforce the permit's "effluent limitations," as defined by the CWA's Section 505(f). The courts have ruled that some permit terms are "requirements" and not "limitations," and refused to enforce them. State agencies need to verify that the nonpoint controls in the NPDES permit meet the definition of "effluent limitations" in order for them to be enforced by citizens.

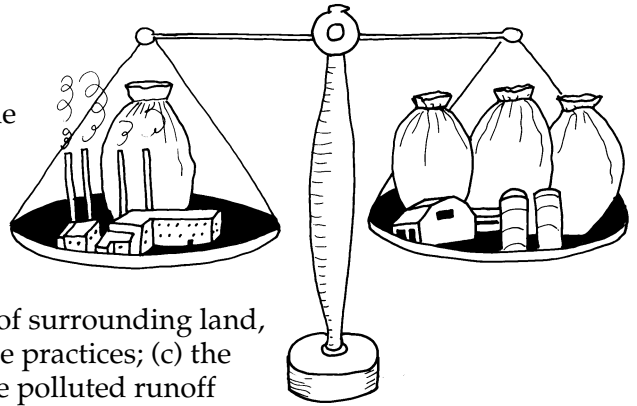
²⁸ Ibid.

²⁹ U.S. EPA, *National Water Quality Inventory*, 1996 Report to Congress.

³⁰ Tar-Pamlico Association comments on U.S. EPA *Draft Framework for Watershed-Based Trading*. See U.S. EPA website, www.epa.gov/owow/watershed/trading.

Safeguard #5: Adequate Trading Ratios

Unlike point source discharges, which can be monitored at the outflow, it is difficult to measure the success of management practices to control nonpoint source pollution. The difficulty in predicting the intended outcome is due to: (a) the diffuse nature of nonpoint source pollution; (b) the fact that the performance of the control measures are a function of site specific conditions, such as soil type and permeability, slope of surrounding land, vegetation types and density, amount of rainfall, and land-use practices; (c) the watershed may be experiencing growth, which could increase polluted runoff problems; and, (d) sediments contaminated with nutrients, toxics, and other pollutants can re-circulate in the water if they are disturbed by dredging, propeller action, storm events, or flooding. As a result, attempts to control nonpoint sources have varying degrees of success.



Problem: For trading programs that include a nonpoint source as a partner, even after states have adopted enforceable nonpoint source controls, there will be some uncertainty surrounding the degree of effectiveness of the control practices.

Trading should only be considered if the overall pollutant load is reduced in the watershed. Keep in mind that the nonpoint source controls have a greater water quality benefit if they are installed close and upstream to the point source buying the controls. The uncertainty regarding the effectiveness of nonpoint source pollution controls make it difficult to ensure a reduction in pollutant loads unless there is an adequate trading ratio in place.

Trading should only be considered if the overall pollutant load is reduced in the watershed.

Your Solution: *The uncertainty associated with trading programs that involve nonpoint sources demands an “insurance policy” to protect water quality. Therefore, require that the proposed trade have an adequate trading ratio. A range of 2:1 to 4:1 should suffice in most circumstances. A 2:1 ratio means that two units of pollutant reduction from a nonpoint source are needed to offset one unit of pollutant reduction from a point source. This ratio is based on the assumption that the nonpoint source controls are much less effective and more difficult to monitor when compared to point source controls.*

Trying to capture all the uncertainty surrounding the effectiveness of nonpoint source controls in one trading ratio is challenging. An alternative is to use multiple ratios. Agencies using multiple trading ratios create better incentives to “do the right thing” for the participating sources. One ratio can be a function of location. If a trading partner wishes to install controls far from his or her plant, require a higher ratio. Another ratio can be used to reflect the uncertainty surrounding the performance of the pollutant control. The state agency could assign a higher trading ratio to a poor control option that lacks a proven record in securing pollutant reductions.



Safeguard #6: Avoidance of “Hot Spots”

The intent of the watershed-based trade is to reduce the overall level of a problem pollutant in the watershed. However, a trade may cause “hot spots”—local concentrations of the pollutant of concern exceeding water quality standards, thereby disrupting aquatic life and public uses.

Problem: Hot spots can occur because a watershed-based trade causes a shift in the discharge of a pollutant along a watershed. Pollutant reductions occur wherever the management practices are being implemented, not necessarily where pollutant reductions need to occur. For example, a point source discharger wishes to increase its pollutant discharge. The discharger installs management practices downstream of its facility. The trading program may improve the watershed’s overall water quality, but the water quality along the stretch of river downstream of the discharger will potentially worsen.

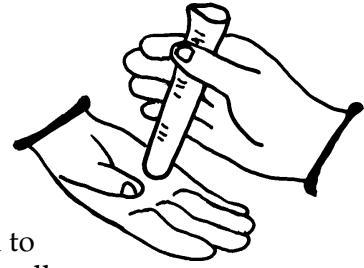
Your Solution: Argue that the watershed-based trade be designed so as to avoid the formation of hot spots. Require careful consideration of: (a) location of potential trading partners within the watershed; (b) scope or size of the watershed where trading can occur, (c) appropriate trading ratio; (d) enforcement; (e) type of pollutant being traded; and, (f) monitoring. Make sure that the partners select a trading ratio that, in effect, sets aside pollutant reduction credits in case the controls at the nonpoint sources fail. Planning for possible failure creates an incentive for the trading partners to have in place adequate monitoring.

Also require that the state agency, U.S. EPA, and the public have the opportunity to revisit the conditions of the trade every five years. Making the trading agreements adjustable allows the agencies and public to evaluate whether the trading program is working. A five-year schedule makes the evaluation coincide with the review schedule for NPDES discharge permits, which are also on a five-year cycle. The trade should also allow for remedies, such as a change in the pollutant cap, if a hot spot is forming well before the end of the five year term for implementing the trading program.

Making the trading agreements adjustable allows the agencies and public to evaluate whether the trading program is working.

Safeguard #7: Sufficient Monitoring

Monitoring is essential for determining current water quality conditions, and whether the offsets designed to achieve reductions of problem pollutants are actually working.



Problem: One problem is that the trading program may not be designed to achieve actual pollutant reductions. A trade that does not reduce the overall pollutant loads simply shifts pollution around in a watershed with no improvement in water quality.

Participants in a trading program may also try to receive “paper credits”—offset credits that do not result in actual emissions reductions. A paper credit would account for pollutant reductions that would occur regardless of the existence of a trading program. Examples include giving credit for: (a) reductions already required by law; (b) reductions resulting from a point source that shuts down; or, (c) further reductions required by the TMDL because the initial pollutant limits failed to attain water quality standards. (This situation is called a “phased TMDL.”)

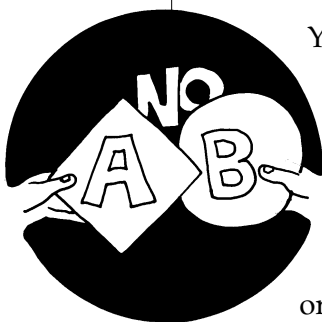
Your Solution: *Do not allow “paper credits.” The proposed trade must offer reasonable assurance that it will result in actual pollutant reductions, and the partners are not receiving credit for pollutant reductions that are currently required or have already occurred.*

Require trading partners to increase monitoring to ensure that the trading program will secure water quality benefits. Ask that trading partners submit an adequate water quality monitoring plan as part of their application for a trade, as well as periodic monitoring data. Thorough, on-going monitoring data will help you determine whether the trading program is working at reducing pollutant concentrations over time and if any hot spots are developing. Make sure that the monitoring plan is incorporated into the point source discharge permit requirements.

Demand that trading partners install controls and demonstrate (using monitoring data) pollutant reductions prior to any increase in discharge. Demonstrating actual pollutant reductions may be very difficult to achieve in some circumstances. Therefore, the “second best” alternative is to require that the trading partners install the pollutant controls prior to increasing the pollutant discharge. The controls must be designed to achieve expected pollutant reductions. In this way, there is a greater likelihood that the trading program will actually achieve its intended results and does not simply become a paper exercise.

Demand that trading partners install controls and demonstrate (using monitoring data) pollutant reductions prior to any increase in discharge.

Safeguard #8: Ban on Trades Involving Different Pollutants



You may see proposals to decrease one pollutant in order to allow for an increase in another, principally because the different pollutants may cause similar impacts. For example, high temperatures, nutrient pollution like phosphorus or nitrates, and high ammonia concentrations all cause fluctuations in dissolved oxygen concentrations. Adequate dissolved oxygen concentrations are necessary for survival of most aquatic life.

Problem: This kind of trading program is like trading apples for oranges—it is too complex to ensure that the trade will result in an overall improvement in water quality. It is nearly impossible to rank relative toxicity, health risk, and wildlife impact posed by different pollutants.

Your Solution: Similar impacts is not an acceptable justification for trades between different types of pollutants. Reject cross-pollutant trades in your watershed.

Safeguard #9: Ban on Trading Across Watersheds



You may see proposals to trade across watersheds or within very large watersheds.

Problem: Any effort to control pollution in one watershed generally will not affect the water quality in a distinctly separate watershed.

For example, imagine a wastewater treatment plant in Watershed A buying controls at the nonpoint source in Watershed B in order to continue or increase his or her discharges. Allowing trades between watersheds does nothing to improve the water quality for the people and wildlife living in Watershed A. In fact, the additional discharge is likely to worsen water quality.

The same can be said about trades in very large watersheds. Trades between participants in very large watersheds will not achieve any localized water quality or ecological benefits. Monitoring the implementation of control actions may be logistically more difficult, as well.

You may hear arguments that trading makes sense in large lake watersheds, where the sources of the lake's pollution problem are in the smaller subwatersheds that drain into the lake. Reductions in problem pollutants in these subwatersheds may benefit the water quality of that lake. Nevertheless, a participant in Subwatershed A of that lake, buying controls in Subwatershed B the same lake, results in no water quality benefits for the people and wildlife residing in Subwatershed A.

You may see cross-watershed trading proposals if dischargers in Watershed A claim: (a) economic hardship to install controls within its own watershed; (b) lack of opportunity to buy controls within its own watershed; or, (c) Watersheds A and B are smaller drainages of the same larger basin, and therefore, would provide some benefit to the overall basin.

Your Solution: The U.S. EPA does not support cross-watershed trading. Do not accept a proposal for a watershed-based trade that would occur between two different watersheds. Trades must be limited to the same watershed in order to provide some ecological benefit. Trades that occur in the same watershed will also ensure that trading partners are governed by the same state agency. Oversight by the same agency will keep administrative costs down and result in better coordination of all parties involved.

For trading proposals in very large watersheds, trades need to be limited to closely associated water segments. This strategy will ensure some ecological benefit for all the involved water segments and will help avoid potential problems with administering the trade. See the discussion of trading ratios above, which offers an example of how the trading ratio can be adjusted, based on location, to encourage trading among sources nearer to each other.

Safeguard #10: Ban on Trading of Toxic Poisons

It is possible that dischargers will propose trading of toxic chemicals in order to keep overall control costs at a minimum.

Problem: Studies show that toxic poisons, such as dioxin, furan, and mercury, are linked to serious public health and environmental effects, even at minute exposures. When present in even small amounts, toxic pollutants can persist, accumulate, or even magnify their toxicity as they move up the food chain. Any additional toxic loadings can cause severe localized effects in receiving waters.

Your Solution: Don't allow trading of any toxic poisons.



Safeguard #11: U.S. EPA Oversight

Problem: The U.S. EPA's involvement is particularly important due to the inconsistent treatment from state to state of similar water quality problems caused by nonpoint source pollution and the lack of treatment all together in many states.³¹ Some state agencies believe that U.S. EPA approval is not necessary to implement watershed-based trading.

Your Solution: In addition to advocating the safeguards described in this chapter, require that any proposed trading program in your state or watershed be approved by the U.S. EPA. The U.S. EPA could evaluate the trade at the time it evaluates the TMDL and NPDES discharge permit.³² The U.S. EPA's involvement will help to provide consistency in the use of trading in watersheds across the country.



³¹ Environmental Law Institute. *Almanac of Enforceable State Laws to Control Nonpoint Source Water Pollution*. 1998, p. 3.

³² While the U.S. EPA has granted authority to most states to implement the NPDES permitting program, some states do not have permitting authority. The U.S. EPA directly implements the permit system in those states.



Safeguard #12: Public Participation

Public involvement in the up-front planning, development, and implementation of any watershed-based trade is essential. The so-called “watershed initiative”—the rising public interest to become involved in decisions and actions to protect local rivers, lakes, estuaries, and coastlines—represents an opportunity for concerned citizens to make a difference. Your involvement will increase the likelihood that a proposed watershed-based trading program will actually achieve cleaner waters.

Problem: There is significant potential for abuse in any trading program. Any of the issues described above could arise. A proposal to trade among point and nonpoint sources may not have an adequate trading ratio or may not include any enforcement provisions to ensure that the practices are designed for site-specific conditions, installed correctly, and maintained adequately.

The traditional means of informing the public—through public notice, hearings, and opportunity for appeal—forces the public to respond to a already fully developed proposal. It is often more difficult to understand the assumptions behind the proposal and the information used to establish the trading protocols if the only chance for the public to weigh in on the proposal is at a formal hearing process. In addition, it is harder to influence the specifics of the proposal once the details have already been developed.

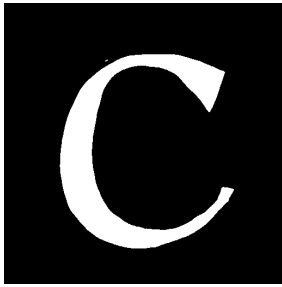
A proposal to trade among point and nonpoint sources may not have an adequate trading ratio or may not include any enforcement provisions to ensure that the practices are designed for site-specific conditions, installed correctly, and maintained adequately.

Your Solution: Help take care of your watershed! Contact your state and learn about your local river or lake. Join your local watershed association (if one exists) and get them involved. Find out about the threats facing your watershed. Try to identify some steps that citizens as well as the state can take to address these threats.

Get involved early in the initial development of any trading discussions. Contact your state agency and find out about what’s happening in your state or watershed. Inquire about taking part in any current or future stakeholder discussions on this topic. Also, ask to be on the mailing list for public notices for any public hearings and comment periods, and request, if necessary, technical assistance to help evaluate the proposed trades.

Request information from the state or the U.S. EPA concerning: (a) any notices of violation issued to potential trading partners, as well as judicial and administrative consent orders; (b) ambient monitoring data and source discharge data in an easy to understand format in order to understand the anticipated effect the proposed trade program will have on the quality of the targeted river or lake segment. (The information requests do not present an unreasonable burden, since the trade will be developed in the context of the TMDL process, the NPDES permitting program, or through regulation of sewage treatment facilities and their indirect dischargers. In addition, it is likely that the proposed trading partners would need to demonstrate that there was sufficient public participation and a responsiveness to public concerns in order to secure state or federal approval.)³³

³³ U.S. EPA, Office of Water. *Draft Framework for Watershed-Based Trading*. 1996.



Conclusion

The twelve guidelines presented in this National Wildlife Federation publication are consistent with the principles described in the U.S. Environmental Protection Agency's draft framework. The U.S. EPA draft framework and this citizens' guide stress the use of the Clean Water Act's (CWA) TMDL watershed restoration process to: (a) establish pollutant ceilings for streams or lakes; and, (b) distribute pollutant reduction responsibilities among the sources. The framework and this guide also emphasize that participants must meet CWA discharge permit requirements to control problem pollutants, and that public participation as a necessary component to trading.

The primary difference is that this guide provides practical techniques and strategies to help watershed associations and concerned citizens ensure that a proposed trading program will actually achieve water quality improvements. This guide goes beyond the U.S. EPA draft framework to emphasize that:

- Participants in a trading program need to have good records of compliance;
- Trades involving nonpoint sources must have adequate trading ratios. These ratios must be designed to reflect current uncertainty about the effectiveness of nonpoint source controls in achieving improved water quality;
- Trades must maintain, not diminish, accountability. At least one participant in a trading program must be responsible for achieving expected pollutant reductions;
- Trading programs must be carefully designed to avoid 'hot spots'—areas of acutely degraded water quality that can result, for example, from the buying up of pollutant credits. The design must consider the physical location of trading partners, size of geographic trading area, trading ratio, enforcement, type of pollutant being traded, and monitoring plans; and,
- Trades involving toxic pollutants, different types of pollutants, and across watersheds must be prohibited.

Also, it is important to note that the U.S. EPA framework is in draft form. The U.S. EPA has not indicated whether they plan to release the framework in final form. It is likely that some states are using the framework to guide the development of their trading policies, while others are not. It is clear that there is a need for a consistent trading policy across the country. The safeguards contained in this guide will help ensure that trading will achieve the desired reductions of a particular pollutant at a lower cost.

It is important to be aware that trading may pose potential inequities. Trading proposals, especially those that allow an increase in discharges in one location, may be shifting the burden of pollution from wealthy communities onto poorer communities. This problem can be avoided by making sure that the public is fully informed and involved in decisions affecting these proposals. Reach out to potentially affected communities to make sure they are included in the discussion.

Thus, trading can be an option to restore watersheds, particularly those that are chronically polluted from nonpoint sources. The potential cost savings from trading to achieve the same water quality goals as a traditional regulatory approach is a powerful argument for trying it.

Public involvement in the development of state trading policies is essential. The public needs to be engaged because of the uncertainty surrounding the effectiveness of nonpoint source pollution controls and state enforcement mechanisms to ensure accountability for these controls. In addition, the public needs to be aware of the potential for developing adverse localized impacts and concern that trading may potentially shift the burden of pollution from wealthy to poorer communities.

It is up to watershed groups and concerned citizens to make sure that any proposed trading program in their watershed is designed with careful consideration of the safeguards described in this guide. Trading can be a new tool for water quality only if citizens get involved and stay involved. Making watershed-based trading work is up to you.

A1

Appendix A1: Definitions

BEST MANAGEMENT PRACTICES (BMPs): Such nonpoint source practices are designed to conserve soil and water resources used in farming and to lessen environmental damage from nonpoint sources, like runoff or erosion management systems at a construction site or timber stand, animal waste storage systems at a farm, or buffer strips along riparian zones.

CLEAN WATER ACT (CWA): The CWA establishes a regulatory framework to protect water quality throughout the United States. The goal is to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” See 33 U.S.C. §§1251-1387.

“COMMAND AND CONTROL”: This statement refers to how regulation historically treats point sources—“commanding” them to “control” pollution in a specific way. Under the command and control style of regulation, the U.S. EPA requires every point source to use the same control equipment and the same methods for reducing pollution, no matter how much they pollute or how much installation costs.

IMPAIRED WATER BODY: An impaired water body is one that is polluted. A state’s TMDL “Impaired Waters List” is a list of the state’s waters that fail or are threatened to fail the state’s water quality standards, even after the installation of pollutant controls. These lists are referred to as “List of Water Quality Limited Segments,” “303(d) Lists,” or “TMDL Lists.”

LOAD ALLOCATION (LA): The LA is the portion of the allowable pollutant discharge attributed to existing and future nonpoint sources.

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT: A NPDES permit is a pollution discharge permit issued, pursuant to the Clean Water Act, by a state agency or by the U.S. EPA to a “point source” discharger. The permit specifies how much of a given pollutant can be present in a discharge and establishes monitoring and reporting requirements for that point source. See Clean Water Act §402: 33 U.S.C. §1342.

NONPOINT SOURCE POLLUTION: Pollution that is diffuse, entering a waterway from a wide geographic area rather than a single pipe. Examples include polluted runoff from urban streets, agricultural fields, timber harvesting areas, airborne pollution, and contaminated sediment.

POINT SOURCE POLLUTION: Pollution caused by a discharge of waste via a pipe. Examples include discharge from municipal wastewater treatment facilities and industries. Most sources are required to have permits with conditions designed to control discharges.

TOTAL MAXIMUM DAILY LOAD (TMDLs): A watershed cleanup program, required by the Clean Water Act under Section 303(d), designed to deal with problem pollutants from all sources, including point and nonpoint sources. This program is important for nonpoint source controls in particular because of the absence of

other mandatory control mechanisms under federal law. Under this provision, states are required to identify waters that are polluted even after all mandated controls have been applied. States must then develop watershed cleanup plans called “TMDLs.” In order for the U.S. EPA to approve a proposed TMDL, the state must demonstrate that there is a “reasonable assurance” that the controls—on nonpoint and point sources alike—can be achieved. See the Clean Water Act: 33 U.S.C. §1313(d).

TRADING RATIO: This ratio is used to account for the uncertainty regarding the effectiveness of nonpoint source controls. It is applied in trades among point and nonpoint sources. A trading ratio of 3:1 means that for every one pound increase of a pollutant from a point source, there must be a corresponding three pound decrease of that pollutant from a nonpoint source.

WASTE LOAD ALLOCATION (WLA): The portion of the allowable pollutant discharge assigned to each existing and future point sources.

WATERSHED: The geographic region from which water drains into a particular water body, like a bay, river, or lake. The watershed includes the land resources as well as the water body. Also called a drainage basin.

A2

Appendix A2: Relevant Websites

Below are Internet-accessible tools and relevant websites to help you find out more about water pollution issues, watershed-based trading, and federal initiatives to address water pollution.

- National Wildlife Federationwww.nwf.org
- U.S. Department of Agriculture:www.usda.gov
1. Agriculture Research Servicewww.ars.usda.gov
 2. Natural Resources Conservation Servicewww.nrcs.usda.gov
 3. Forest Servicewww.fs.fed.us
- U.S. Department of Commerce, National Oceanic and Atmospheric Administrationwww.noaa.gov
- U.S. Department of Interior
1. Bureau of Land Management[www.blm.gov/education/Environmental Education Programs](http://www.blm.gov/education/Environmental%20Education%20Programs) **education**
 2. Fish & Wildlife Servicewww.fws.gov
- U.S. Environmental Protection Agencywww.epa.gov
1. Watershed-based trading Homepagewww.epa.gov/owow/watershed/trading
 2. Surf Your Watershedwww.epa.gov/surf or www.epa.gov/nwapsurf
 3. Envirofactswww.epa.gov/enviro/index
 4. Nonpoint Source Homepagewww.epa.gov/owow/nps
 5. TMDL Homepagewww.epa.gov/owow/tmdl
 6. Acid Rain Programwww.epa.gov/acidrain/ardhome

SEARCH ENGINES:

- Amazing Environmental Organizationwww.webdirectory.com
WebDirectory
- EnviroLink-EnviroWeb(CMU, Pittsburgh PA)www.envirolink.org
- IGC's EcoNet Environmental Directorywww.igc.org/igc/econet/index
- Infoseekwww.infoseek.com/Science/Environment?SV=N3
- WWW Virtual Library Subject List on the Environment (EcoWeb, University of VA)www.earthsystems.org/Environment.shtml
- Yahoo's Index to Environmental WebSiteswww.yahoo.com/Environment_and_Nature

FEDERAL GOVERNMENT INFORMATION:

Thomas: Legislative Information www.thomas.loc.gov
U.S. Senate www.senate.gov
U.S. House of Representatives www.house.gov
The White House www.whitehouse.gov

CITIZEN MONITORING:

River Watch Network www.riverwatch.org

OTHER USEFUL SITES

Earth Times: environmental news daily www.earthtimes.org
Environmental Information Resources [www.gwu.edu/~greenu/
index2](http://www.gwu.edu/~greenu/index2)

A3

Appendix A3: Lessons from Emissions Trading under the Clean Air Act

Title IV of the Clean Air Act Amendments of 1990 (CAAA) set up an emissions trading program to curb sulfur dioxide emissions, one of the causes of acid rain.³⁴ All electric power plants: (a) are required to reduce and cap their sulfur dioxide emissions; and, (b) may trade any emissions reductions they make below that emissions cap.³⁵ Since 1995, major point sources of acid rain emissions (electric utilities that emit sulfur dioxide, such as coal and oil-fired power plants) have been trading emissions allocations on a national basis. In the first two years of the program, utilities achieved 35 percent more reductions than required. At the same time, electricity generation and general economic well-being in the U.S. increased, indicating little effect of the cost of acid rain controls on the economy.³⁶

Emissions trading under the CAAA was the first national effort in applying an incentive-based approach to reduce pollution.³⁷ The following discussion identifies several lessons from the sulfur dioxide trading program that should be considered in any watershed-based trading proposal:

A clear federal policy and uniform state policies on discharges into polluted waters will make trading programs more effective. The CAAA specifically describe the conditions under which industry can increase discharges into areas that are not meeting air quality standards. New emissions from electric utilities emitting sulfur dioxide are allowed only if purchases of sulfur dioxide allowances representing sulfur dioxide emissions elsewhere more than offset the proposed increase in emissions. The new U.S. EPA regulations on the CWA's TMDL provision, expected to be released sometime in 1999, should address this need.

Nonpoint sources are an important part of any trading program. Only electric utility point sources are required to be involved in the sulfur dioxide emissions trading program. Gains from trading may be overcome by increases in other sources of pollution, such as mobile sources. Since water pollution from nonpoint sources represents the greatest threat to water quality today, any watershed-based trading policy needs to consider the contribution of nonpoint sources.

Credits must translate into real pollution reductions. A trading program must not allow "paper credits,"—offset credits that do not result in actual emissions reductions.³⁸ Participants in a trading program must not take credit for pollution reductions that would occur in the absence of a trading program. There should be no credit for reductions already required by law or reductions resulting from a point source that shuts down. A "phased" TMDL is a good example of this situation. A phased TMDL allows for a tightening up of the TMDL's point and nonpoint source controls if the initial design of the TMDL proves inadequate for

³⁴ Goffman, J. and D. Dudek. *The Clean Air Act Acid Rain Program: Lessons for Success in Creating a New Paradigm*. 1995. For presentation at the 88th Annual Meeting & Exhibition of the Air & Waste Management Association, San Antonio, TX, June 18-23, 1995. p. 2.

³⁵ Dudek, D., J. Goffman, D. Salon, S. Wade. *More Clean Air for the Buck: Lessons from the U.S. Acid Rain Program*. 1997. Environmental Defense Fund. p. I.

³⁶ Ibid.

³⁷ Utilities must still comply with the existing requirements under the Clean Air Act.

³⁸ Adler, Robert W. *Integrated Approaches to the Water Pollution Problem: Lessons from the Clean Air Act*. 1998.

achieving water quality standards. Under phased TMDLs, the sources should not get credit for this adjustment.

A trading registry for watershed-based trading would facilitate trades and increase public involvement in the trading process. It took several years for the sulfur dioxide emissions trading program to get underway. Private brokerage services play an important role in supplying information to potential traders, getting trading partners together, and generally facilitating the trading of emission reduction credits (called sulfur dioxide allowances).³⁹ The state of Michigan has established an electronic registry for air emissions trading. The registry provides information on every aspect of trading, from credit price to company histories. A similar registry to support watershed-based trading will assist other states as they consider similar programs as well as inform the public about trading and how to participate in local initiatives.

Hot spots are a risk in watershed-based trading. Trading can induce “hot spots” or site-specific impacts. Although acid rain emissions tend to have widespread and regional effects, their “hot spots” tend to be large geographic areas that are downwind from the sources. The northeastern United States still suffers from acid rain due to upwind sources.⁴⁰ Watershed-based trading of pollutants can have more localized effects. Pollutants can concentrate and affect very specific areas.⁴¹ The risk of hot spots emphasizes the need for: (a) careful consideration of the trading scheme’s scope (i.e., geographic location of trading partners); (b) trading ratios or other market remedies, possibly based on geographic areas;⁴² and, (c) increased monitoring to identify any hot spots that may be developing.

Trading programs allow the public to actively participate in order to reduce pollution. The sulfur dioxide emissions trading program established a market that could potentially allow for environmental groups to purchase allotments or credits and retire them, lowering the overall level of pollution. Trading programs should allow for independent groups to actively reduce pollution, in addition to participating in the design process for establishing a trade or voicing concerns about a proposed trade.

The overall cap for any watershed-based trading scheme must accurately reflect the allowable level of pollutants in that watershed. Establishing credits of pollutant allowances—saving allowances for some time in the future—is a good incentive to bring potential trading partners together and secure pollutant reductions beyond current required targets. Much of the reduction in acid rain emissions is in the form of credit—partners “over-controlling” for pollutants (reducing pollutants below the required level). Point sources then apply credits towards anticipated future emissions.⁴³ Establishing a similar incentive for watershed-based trading requires an up-front determination of the river or stream’s ability to safely absorb the pollutants of concern without compromising water quality standards. This determination of the “assimilative capacity” helps to assure that the trading scheme will not prevent the watershed from meeting water quality standards.

³⁹ Stavins, Robert. “Transactions Costs and Markets for Pollution Control,” *Resources*, No.119, 1995, p.19.

⁴⁰ The northeastern United States should receive some relief after the year 2000 when the CAAA’s second phase, calling for greater reductions, begins.

⁴¹ Adler, p.78.

⁴² Claire Schary, U.S. EPA Region X, personal communication, September 1998.

⁴³ Dudek, et al., p.6.

A4

Appendix A4: Assessment of Trading Initiatives by State

	Status of Trading					Current Trades		
	No Examples At Present	Redistribution of WLA's	Possible in Context of TMDLs	Developing Pilot Program	Developing State Program	Type of Trade	Pollutant(s) of Concern	TMDL in Place
Alabama	✓							
Alaska	✓							
Arizona	✓		✓					
Arkansas	✓							
California			✓			NPS	Se	N
Colorado						P/NP	P	Y
Connecticut				✓		PS	P	Y
Delaware	✓							
Florida	✓		✓					
Georgia	✓							
Hawaii	✓							
Idaho				✓				
Illinois	✓							
Indiana	✓							
Iowa	✓	✓						
Kansas	✓		✓					
Kentucky	✓							
Louisiana	✓							
Maine	✓							
Maryland	✓				✓			
Massachusetts			✓	✓	✓			
Michigan				✓	✓			
Minnesota						P/NP	BOD	Y
Mississippi	✓		✓					
Missouri	✓							
Montana	✓							
Nebraska	✓							
Nevada	✓	✓						
New Hampshire	✓							
New Jersey					✓	PRE	M	N
New Mexico	✓							
New York						P/NP	P	Y
North Carolina						P/NP	P,N	Y

KEY

Definitions

- PS - Trading among point sources
- P/NP - trading between point and nonpoint sources
- PRE - pretreatment trading among indirect sources
- WLA - waste load allocation, or limits for point sources

Type of Pollutant

- P - phosphorus
- N - nitrogen
- BOD - biological oxygen demand
- Se - selenium
- M - metals

	Status of Trading						Current Trades	
	No Examples At Present	Redistribution of WLA's	Possible in Context of TMDLs	Developing Pilot Program	Developing State Program	Type of Trade	Pollutant(s) of Concern	TMDL in Place
North Dakota			✓					
Ohio	✓		✓					
Oklahoma	✓							
Oregon	✓				✓			
Pennsylvania	✓							
Puerto Rico	✓							
Rhode Island	✓							
South Carolina	✓	✓						
South Dakota	✓							
Tennessee	✓							
Texas	✓							
Utah	✓							
Vermont	✓				✓			
Virgin Islands	✓							
Virginia	✓		✓					
Washington			✓	✓				
Washington DC	✓		✓					
West Virginia	✓							
Wisconsin				✓				
Wyoming	✓							

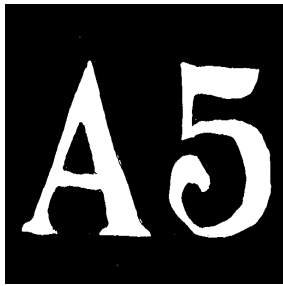
KEY

Definitions

- PS - Trading among point sources
- P/NP - trading between point and nonpoint sources
- PRE - pretreatment trading among indirect sources
- WLA - waste load allocation, or limits for point sources

Type of Pollutant

- P - phosphorus
- N - nitrogen
- BOD - biological oxygen demand
- Se - selenium
- M - metals



Appendix A5: Who to Contact in your State to Get Involved

ALABAMA

State Agency: State of Alabama, Department of Environmental Management
Agency Contact: James McIndoe
Address: P. O. Box 301463, Montgomery, AL 36130-1463
Phone/E-Mail: 334-271-7826 / jmi@adem.state.al.us

Federal Agency: US EPA Region 4
Agency Contact: Marshall Hyatt
Address: Water Quality Management Branch, 61 Forsyth Street, Atlanta, GA 30303
Phone/E-Mail: 404-562-9304 / hyatt.marshall@epamail.epa.gov

Trading Status: *No examples at present*

ALASKA

State Agency: State of Alaska, Dept. of Environmental Conservation
Agency Contact: Tom Chapple
Address: 555 Cordova Street, Anchorage, AK 99501-2617
Phone/E-Mail: 907-269-7634 / TChapple@envircon.state.ak.us
Alternate: Susan Braley
Address: 410 Willoughby Avenue, Suite 105, Juneau, AK 99801-1795
Phone/E-mail: 907-465-5308

Federal Agency: US EPA Region 10, Water Division
Agency Contact: Claire Schary
Address: Mail code OI-085, 1200 Sixth Avenue, Seattle, WA 98101
Phone/E-mail: 206-553-8514 / schary.claire@epamail.epa.gov

Trading Status: *No examples at present*

ARIZONA

State Agency: State of Arizona, Department of Environmental Quality
Agency Contact: Linda Taunt, NPDES Coordinator
Address: 3033 North Central Avenue, Phoenix, AZ 85012
Phone/E-Mail: 602-207-4510

Federal Agency: US EPA Region 9
Agency Contact: Terry Oda, Chief, Standards and Permits Office
Address: 75 Hawthorne Street, San Francisco, CA 94105
Phone/E-Mail: 415-744-1923 / oda.terry@epamail.epa.gov

Trading Status: *No examples at present*

ARKANSAS

State Agency: State of Arkansas, Division of Water
Agency Contact: Chuck Bennett, Director
Address: P. O. Box 8913, Little Rock, AR 72219
Phone/E-Mail: 501-682-0744 / ccb@adeq.state.ar.us

Federal Agency: US EPA Region 6
Agency Contact: Troy Hill
Address: 1445 Ross Avenue, Dallas, TX 75202-2733
Phone/E-mail: 214-665-8022 / hill.troy@epamail.epa.gov

Trading Status: *No examples at present*

CALIFORNIA

State Agency: California State Water Resources Board
Agency Contact: Stephan Lorenzato
Address: 901 P Street, Sacramento, CA 95814
Phone/E-Mail: 916-657-3222 / slorenzato@exec.swrcb.ca.gov

Federal Agency: US EPA Region 9
Agency Contact: Terry Oda, Chief, Standards and Permits Office
Address: 75 Hawthorne Street, San Francisco, CA 94105
Phone/E-Mail: 415-744-1923 / oda.terry@epamail.epa.gov

Trading Status: *There is trading among agricultural nonpoint sources in the San Joaquin River for selenium. See, "Ploughing New Ground: Using Economic Incentives to Control Water Pollution from Agriculture," Environmental Defense Fund.*

COLORADO

State Agency: Colorado Department of Public Health and Environment
Agency Contact: Greg Parsons
Address: Water Quality Control Division, 4300 Cherry Creek Drive,
South Denver, CO 80222
Phone/E-Mail: 303-692-3585 / greg.parsons@state.co.us

Federal Agency: US EPA Region 8
Agency Contact: Dr. Bob Erickson
Address: 999 18th Street, Suite 500 Denver, CO 80202-2405
Phone/E-Mail: 303-312-7027 / erickson.bob@epamail.epa.gov

Trading Status: *There are three control regulations in basins that allow for trading: Lake Dillon, Cherry Creek Reservoir, and Chatfield Basin Reservoir. Trading between nonpoint sources and point sources has occurred in the first two.*

CONNECTICUT

State Agency: Department of Environmental Protection
Agency Contact: Bob Norwood
Address: Water Management Bureau
79 Elm Street, Hartford, CT 06106-1773
Phone/E-Mail: 860-424-3746 / bob.norwood@po.state.ct.us

Federal Agency: US EPA Long Island Sound Office
Agency Contact: Mark Tedesco
Address: Stamford Government Center
888 Washington Blvd., Stamford, CT 06904-2152
Phone/E-Mail: 203-977-1541
Alternate Contact: John Hackler
Address: Connecticut State Program Unit EPA (CCT)
New England, Region 1
1 Congress Street, Suite 1100, Boston, MA 02114-2023
Phone/E-mail: 617-918-1551 / hackler.john@epamail.epa.gov

Trading Status: *There is a proposed point source trading program in place for nitrogen in the Long Island Sound. No trades have happened. (See EPA Website: epa.gov/region01/eco/lis.)*

DELAWARE

State Agency: Delaware Department of Natural Resources & Environmental Control

Agency Contact: Peder Hansen, Surface Water Discharge Section

Address: 89 Kingshighway, Dover, DE 19901

Phone/E-Mail: 302-739-5731 / rhansen@state.de.us

Federal Agency: US EPA Region 3

Agency Contact: Francisco Cruze

Address: 1650 Arch St., Philadelphia, PA 19103

Phone/E-Mail: 215-814-5734 / cruze.francisco@epamail.epa.gov

Trading Status: *No examples at present*

DISTRICT OF COLUMBIA

Local Agency: District of Columbia Department of Public Works

Agency Contact: Mike Marcotte

Address: Water & Sewer Authority

5000 Overlook Ave. S.W., Washington D.C. 20032

Phone/E-Mail: 202-645-6160 / marcottem@aol.com

Federal Agency: US EPA Region 3

Agency Contact: Alison Wiedeman

Address: Chesapeake Bay Program Office

841 Chestnut Street, Annapolis, MD 21403

Phone/E-mail: 410-267-5733 / wiedeman.alison@epamail.epa.gov

Trading Status: *No examples at present*

FLORIDA

State Agency: State of Florida, Department of Environmental Protection

Agency Contact: Richard Drew

Address: Mail Station 3535, 2600 Blair Stone Road

Tallahassee, FL 32399-2400

Phone/E-Mail: 850-487-0563 / drew_r@dep.state.fl.us

Federal Agency: US EPA Region 4

Agency Contact: Marshall Hyatt

Address: Water Quality Management Branch

61 Forsyth Street, Atlanta, GA 30303

Phone/E-Mail: 404-562-9304 / hyatt.marshall@epamail.epa.gov

Trading Status: *No examples at present*

GEORGIA

State Agency: State of Georgia, Environmental Protection Department
Agency Contact: Clint Moye, TMDL Coordinator, Water Protection Branch
Address: Floyd Towers East, Suite 1058, 205 Butler Street S.E.
Atlanta, GA 30334

Phone/E-Mail: 404-675-6232 / clint_moye@mail.dnr.state.ga.us

Federal Agency: US EPA Region 4

Agency Contact: Marshall Hyatt
Address: Water Quality Management Branch
61 Forsyth Street, Atlanta, GA 30303

Phone/E-Mail: 404-562-9304 / hyatt.marshall@epamail.epa.gov

Trading Status: *No examples at present*

HAWAII

State Agency: State of Hawaii, Department of Health

Agency Contact: Dennis Lau
Address: Office of Environmental Quality Control
919 Ala Moana Blvd Honolulu, HI 96814

Phone/E-Mail: 808-586-4311 / dlau@eha.health.state.hi.us

Federal Agency: US EPA Region 9

Agency Contact: Terry Oda, Chief, Standards and Permits Office
Address: 75 Hawthorne Street, San Francisco, CA 94105

Phone/E-Mail: 415-744-1923 / oda.terry@epamail.epa.gov

Trading Status: *No examples at present*

IDAHO

State Agency: State of Idaho, Division of Environmental Quality

Agency Contact: Larry Peterson
Address: 1445 North Orchard, Boise, ID 83706
Phone/E-Mail: 208-373-0550 (0576 fax) / lpeterso@deq.state.id.us

Federal Agency: US EPA Region 10, Water Division

Agency Contact: Claire Schary
Address: Mail code OI-085, 1200 Sixth Avenue, Seattle, WA 98101

Phone/E-mail: 206-553-8514 / schary.claire@epamail.epa.gov

Trading Status: *A pilot trading program is being developed on the lower Boise River for phosphorus. By the end of 1999, all the market elements should be in place for trading to begin.*

ILLINOIS

State Agency: State of Illinois, Environmental Protection Agency
Agency Contact: Bruce Yurdin
Address: PO Box 19726, Springfield, IL 62794-9726
Phone/E-Mail: 217-782-0610 / epa1177@epa.state.il.us

Federal Agency: US EPA Region 5
Agency Contact: Peter Swenson
Address: 77 West Jackson Boulevard, Chicago, IL 60604-3507
Phone/E-mail: 312-886-0236 / swenson.peter@epamail.epa.gov

Trading Status: *No examples at present*

INDIANA

State Agency: State of Indiana, Department of Environmental Management
Agency Contact: Matt Reuff
Address: 100 North Senate Ave., PO Box 6015
Indianapolis, IN 46206-6015
Phone/E-Mail: 317-232-8476 / mreuff@dem.state.in.us

Federal Agency: US EPA Region 5
Agency Contact: Peter Swenson
Address: 77 West Jackson Boulevard, Chicago, IL 60604-3507
Phone/E-mail: 312-886-0236 / swenson.peter@epamail.epa.gov

Trading Status: *No examples at present*

IOWA

State Agency: State of Iowa, Department of Natural Resources
Agency Contact: Jack Riessen, Water Quality Bureau Chief
Address: Environmental Protection Division
E. 9th & Grand Ave., Wallace Building
Des Moines, IA 50319-0034
Phone/E-Mail: 515-281-5029

Federal Agency: US EPA Region 7
Agency Contact: John Dunn
Address: 726 Minnesota Avenue, Kansas City, KS 66101
Phone/E-Mail: 913-551-7594

Trading Status: *No examples at present*

KANSAS

State Agency: Kansas Department of Health and Environment
Agency Contact: Don Snethen
Address: Bureau of Water, Forksfield, Building 283, Topeka, KS 66620
Phone/E-Mail: 785-296-5567 / dsnethen@kdhe.state.ks.us

Federal Agency: US EPA Region 7
Agency Contact: John Dunn
Address: 726 Minnesota Avenue, Kansas City, KS 66101
Phone/E-Mail: 913-551-7594

Trading Status: *No examples at present*

KENTUCKY

State Agency: State of Kentucky, Division of Water
Agency Contact: Bruce Scott
Address: KPDES Permitting Branch, 14 Reilly Road, Frankfort, KY 40601
Phone/E-Mail: 502-564-3410 xt.437 / scott_r@nrdep.nr.state.ky.us

Federal Agency: US EPA Region 4
Agency Contact: Marshall Hyatt
Address: Water Quality Management Branch
61 Forsyth Street, Atlanta, GA 30303
Phone/E-Mail: 404-562-9304 / hyatt.marshall@epamail.epa.gov

Trading Status: *No examples at present*

LOUISIANA

State Agency: State of Louisiana, Department of Environmental Quality
Agency Contact: Emelise Cormier
Address: Office of Water, Water Quality Management Division.
P.O. Box 82215, Baton Rouge, LA 70884
Phone/E-Mail: 504-765-0551 / emelise_c@deq.state.la.us

Federal Agency: US EPA Region 6
Agency Contact: Troy Hill
Address: 1445 Ross Avenue, Dallas, TX 75202-2733
Phone/E-mail: 214-665-8022 / hill.troy@epamail.epa.gov

Trading Status: *No examples at present*

MAINE

State Agency: State of Maine, Division of Environmental Protection
Agency Contact: Michael Barden
Address: Bureau of Land and Water Quality
17 State House Station, Augusta, ME 04333-0017
Phone/E-Mail: 207-287-3901 / michael.t.barden@state.me.us

Federal Agency: US EPA Region 1
Contact: Stephen Silva
Address: Maine State Program Unit (CME)
EPA - New England, Region 1
1 Congress Street, Suite 1100, Boston, MA 02114-2023
Phone/E-mail: 617-918-1561 / silva.stephen@epa.gov
Alternate Contact: Roger Janson
Address: Water Quality Management Unit (CWQ)
EPA - New England, Region 1
1 Congress Street, Suite 1100, Boston, MA 02114-2023
Phone/E-mail: 617-918-1621 / janson.roger@epa.gov

Trading Status: *No examples at present*

MARYLAND

State Agency: State of Maryland, Department of the Environment
Agency Contact: Virginia Kearney
Address: 2500 Broening Highway, Baltimore, MD 21224
Phone/E-Mail: 410-631-3574 / vkearney@mde.state.md.us

Federal Agency: US EPA Region 3
Agency Contact: Alison Wiedeman
Address: Chesapeake Bay Program Office, 841 Chestnut Street,
Annapolis, MD 21403
Phone/E-mail: 410-267-5733 / wiedeman.alison@epamail.epa.gov

Trading Status: *State is drafting a framework for trading as a possible response to the nutrient caps established by the Chesapeake Bay Program.*

MASSACHUSETTS

State Agency: Department of Environmental Protection

Agency Contact: Paul Hogan

Address: 627 Main Street, Worcester, MA 01608

Phone/E-Mail: 508-792-7650 / paul.hogan@state.ma.us

Federal Agency: US EPA Region 1

Agency Contact: Jane Downing

Address: Massachusetts State Program Unit (CMA), EPA - New England, Region 1

1 Congress Street, Suite 1100, Boston, MA 02114-2023

Phone/E-mail 617-918-1571 / downing.jane@epa.gov

Alternate Contact: Roger Jansen

Address: Water Quality Management Unit (CWQ), EPA - New England, Region 1, 1 Congress Street, Suite 1100, Boston, MA 02114-2023

Phone/E-mail: 617-918-1621 / jansen.roger@epa.gov

Trading Status: *An NPDES permit is in place that allows an office building complex in Wayland to repair leaking septic systems on two dozen neighboring properties instead of installing more expensive wastewater controls at the complex. There are also draft NPDES permits that include trading in the town of Acton and on the Hoosic River in N. Adams.*

MICHIGAN

State Agency: Department of Environmental Quality

Agency Contact: Dave Batchelor

Address: Surface Water Quality Division
P.O. Box 30273, Lansing, MI 48909-7773

Phone/E-Mail: 517 373-2677 / batchelord@state.mi.us

Federal Agency: US EPA Region 5

Agency Contact: Peter Swenson

Address: 77 West Jackson Boulevard, Chicago, IL 60604-3507

Phone/E-mail: 312-886-0236 / swenson.peter@epamail.epa.gov

Trading Status: *A trading pilot project is being developed on the Kalamazoo River that will generate a state framework for trading. See MI DEQ website: www.deq.state.mi.us/swq*

MINNESOTA

State Agency: Minnesota Pollution Control Agency
Agency Contact: Norman Senjem
Address: 18 Wood Lake Drive, Rochester MN 55904
Phone/E-Mail: 507-280-3592 / norman.senjem@pca.state.mn.us

Federal Agency: US EPA Region 5
Agency Contact: Peter Swenson
Address: 77 West Jackson Boulevard, Chicago, IL 60604-3507
Phone/E-mail: 312-886-0236 / swenson.peter@epamail.epa.gov

Trading Status: *Point/nonpoint trade involving Rahr Malting Company on Lower Minnesota River.*

MISSISSIPPI

State Agency: State of Mississippi, Office of Pollution Control
Agency Contact: Randy Reed
Address: P. O. Box 10385, Jackson, MS 39289-0385
Phone/E-Mail: 601-961-5158 / Randy_Reed@deq.state.ms.us

Federal Agency: US EPA Region 4
Agency Contact: Marshall Hyatt
Address: Water Quality Management Branch
61 Forsyth Street, Atlanta, GA 30303
Phone/E-Mail: 404-562-9304 / hyatt.marshall@epamail.epa.gov

Trading Status: *No examples at present*

MISSOURI

State Agency: State of Missouri Dept of Natural Resources
Agency Contact: John Madras, Chief of Planning
Division of Water Pollution Control
Address: PO Box 176, Jefferson City, MO 65101
Phone/E-Mail: 573-751-7428 / nrmadrj@mail.dnr.state.mo.us

Federal Agency: US EPA Region 7
Agency Contact: John Dunn
Address: 726 Minnesota Avenue, Kansas City, KS 66101
Phone/E-Mail: 913-551-7594

Trading Status: *No examples at present*

MONTANA

State Agency: State of Montana, Department of Environmental Quality
Agency Contact: Stuart Lehman
Address: P. O. Box 200901, Helena, MT 59620-0901
Phone/E-Mail: 406-444-5319 / e-mail: stlehman@mt.state.us

Federal Agency: US EPA Region 8
Agency Contact: Dr. Bob Erikson
Address: 999 18th Street, Denver, CO 80202-2405
Phone/E-Mail: 303-312-7027 / erickson.bob@epamail.epa.gov

Trading Status: *No examples at present, but trading is proposed in House Bill No. 546.*

NEBRASKA

State Agency: State of Nebraska, Department of Environmental Quality
Agency Contact: Steve Walker, Surface Water Division
Address: P. O. Box 98922, Lincoln, NE 68509-8922
Phone/E-Mail: 402-471-4700 / deq013@mail.deq.state.ne.us

Federal Agency: US EPA Region 7
Agency Contact: John Dunn
Address: 726 Minnesota Avenue, Kansas City, KS 66101
Phone/E-Mail: 913-551-7594

Trading Status: *No examples at present*

NEVADA

State Agency: State of Nevada, Division of Environmental Protection
Agency Contact: Kathy Poole
Address: 333 W. Nye Lane, Suite 138, Carson City, NV 89706
Phone/E-Mail: 702-687-4670 ext. 3050

Federal Agency: US EPA Region 9
Agency Contact: Terry Oda, Chief, Standards and Permits Office
Address: 75 Hawthorne Street, San Francisco, CA 94105
Phone/E-Mail: 415-744-1923 / oda.terry@epamail.epa.gov

Trading Status: *Some shifting of waste load allocation among point sources but no trading.*

NEW HAMPSHIRE

State Agency: State of New Hampshire Department of Environmental Services

Agency Contact: Sherry Godlewski
Address: 64 North Main Street, Concord, NH 03301
Phone/E-Mail: 603-271-3010 / s_godlewski@des.state.nh.us

Federal Agency: EPA Region 1

Contact: Carl DeLoi
Address: New Hampshire State Program Unit (CNH)
EPA - New England, Region 1
1 Congress Street, Suite 1100, Boston, MA 02114-2023

Phone/E-Mail: 617-918-1581 / deloi.carl@epa.gov

Alternate Contact: Roger Janson
Address: Water Quality Management Unit (CWQ), EPA - New England,
Region 1, 1 Congress Street, Suite 1100, Boston, MA 02114-2023

Phone/E-mail: 617-918-1621 / janson.roger@epa.mail

Trading Status: *No examples at present*

NEW JERSEY

State Agency: State of New Jersey, Department of Environmental Protection

Agency Contact: Lance Miller
Address: Office of Environmental Planning
PO Box 418, 401 E. State Street, Trenton, NJ 08625-0418
Phone/E-Mail: 609-984-0058 / lmiller@dep.state.nj.us

Federal Agency: US EPA Headquarters

Agency Contact: Catherine Tunis, Office of Policy, Planning and Evaluation
Address: 401 M Street, S.W. (2128), Washington, DC 20460
Phone/E-Mail: 202 260-2698 / tunis.catherine@epamail.epa.gov

Trading Status: *There is a pretreatment trading program in place in the lower Passaic Valley for metals, see Sharing the Load: Effluent Trading for Indirect Dischargers, EPA Document #231-R-98-003.*

NEW MEXICO

State Agency: State of New Mexico, Department of Surface Water
Agency Contact: Erik Galloway
Address: NMED/SWQB
1190 St. Francis Dr., P. O. Box 26110, Santa Fe, NM 87502
Phone/E-Mail: 505-827-2923 / erik_galloway@nmenv.states.nm.us

Federal Agency: US EPA Region 6
Agency Contact: Troy Hill
Address: 1445 Ross Avenue, Dallas, TX 75202-2733
Phone/E-mail: 214-665-8022 / hill.troy@epamail.epa.gov

Trading Status: No examples at present

NEW YORK

State Agency: Division of Water
Agency Contact: Philip DeGaetano
Address: Division of Water, 50 Wolf Road, Albany, NY 12233-3500
Phone/E-Mail: 518-457-0633

Federal Agency: US EPA Region 2
Agency Contact: Phil Sweeney, Permitting Chief
Address: Division of Environmental Planning & Protection
290 Broadway, 24th Floor, New York, NY 10007-1866
Phone/E-Mail: 212-637-3873 / sweeney.philip@epamail.epa.gov

Trading Status: A phosphorus offset program is in place for the New York City watershed where by new point source discharges can be offset by other reductions elsewhere.

NORTH CAROLINA

State Agency: State of North Carolina, Department of Environment, Health and Natural Resources
Agency Contact: Rich Gannon, Division of Water Quality
Address: 512 N. Salisbury St., Raleigh, NC 27604
Phone/E-Mail: 919-733-5083 xt. 356 / rich_gannon@h2o.enr.state.nc.us

Federal Agency: US EPA Region 4
Agency Contact: Marshall Hyatt
Address: Water Quality Management Branch
61 Forsyth Street, Atlanta, GA 30303
Phone/E-Mail: 404-562-9304 / hyatt.marshall@epamail.epa.gov

Trading Status: Nutrient trading program in place in the Tar-Pamlico River Basin among point sources and nonpoint sources.
See NCENR web site: www.h2o.enr.state.nc.us/nps/nps_hp.htm.

NORTH DAKOTA

State Agency: State of North Dakota, Department of Health
Agency Contact: Dennis Fewless
Address: PO Box 5520 , Bismarck, ND 58506-5520
Phone/E-Mail: 701-328-5150 / dfewless@state.nd.us

Federal Agency: US EPA Region 8
Agency Contact: Dr. Bob Erickson
Address: 999 18th Street, Denver, CO 80202-2405
Phone/E-Mail: 303-312-7027 / erickson.bob@epamail.epa.gov

Trading Status: *No examples at present*

OHIO

State Agency: State of Ohio, Environmental Protection Agency
Agency Contact: Gail Hesse
Address: Division of Surface Water
P. O. Box 1049, Columbus, OH 43216-1049
Phone/E-Mail: 614-644-2146 / gail.hesse@epa.state.oh.us

Federal Agency: US EPA Region 5
Agency Contact: Peter Swenson
Address: 77 West Jackson Boulevard, Chicago, IL 60604-3507
Phone/E-mail: 312-886-0236 / swenson.peter@epamail.epa.gov

Trading Status: *No examples at present*

OKLAHOMA

State Agency: State of Oklahoma, Department of Environmental Quality
Agency Contact: Quang Pham, Permitting Chief
Address: 707 N. Robinson Street, PO Box 1677
Oklahoma City, OK 73101-1677
Phone/E-Mail: 405-702-8183

Federal Agency: US EPA Region 6
Agency Contact: Troy Hill
Address: 1445 Ross Avenue, Dallas, TX 75202-2733
Phone/E-mail: 214-665-8022 / hill.troy@epamail.epa.gov

Trading Status: *No examples at present*

OREGON

State Agency: State of Oregon, Department of Environmental Quality
Agency Contact: Judy Johndohl

Address: Water Quality Division
811 Southwest 6th Avenue, Portland, OR 97204

Phone/E-Mail: 503-229-6896 / johndohl.judy.k@deq.state.or.us

Federal Agency: US EPA Region 10, Water Division

Agency Contact: Claire Schary

Address: Mail code OI-085, 1200 Sixth Avenue, Seattle, WA 98101

Phone/E-mail: 206-553-8514 / schary.claire@epamail.epa.gov

Trading Status: *No examples at present*

PENNSYLVANIA

State Agency: State of Pennsylvania
Department of Environmental Protection

Agency Contact: Stuart Gansell, Director of Bureau of Watershed Conservation

Address: Bureau of Watershed Conservation
P. O. Box 8555, Harrisburg, PA 17105-8555

Phone/E-Mail: 717-787-5267

Federal Agency: US EPA Region 3

Agency Contact: Alison Wiedeman

Address: Chesapeake Bay Program Office
841 Chestnut Street, Annapolis, MD 21403

Phone/E-mail: 410-267-5733 / wiedeman.alison@epamail.epa.gov

Trading Status: *No examples at present*

PUERTO RICO

State Agency: Division of Water Quality

Agency Contact: Robert Ayala

Address: PO Box 11488, San Juan, Puerto Rico 00910

Phone/E-Mail: 787-767-8073

Federal Agency: US EPA Region 2

Agency Contact: Phil Sweeney

Address: Division of Environmental Planning & Protection
290 Broadway, 24th Floor, New York, NY 10007-1866

Phone/E-Mail: 212-637-3873 / sweeney.philip@epamail.epa.gov

Trading Status: *No examples at present*

RHODE ISLAND

State Agency: State of Rhode Island
Department of Environmental Management

Agency Contact: Angelo Liberti
Address: Office of Water Resources
235 Promenade Street, Providence, RI 02908

Phone/E-Mail: 401-222-4700 ext. 7225 / aliberti@dem.state.ri.us

Federal Agency: US EPA Region 1

Contact: Robert Mendoza
Address: Rhode Island State Program Unit (CRI)
EPA - New England, Region 1
1 Congress Street, Suite 1100, Boston, MA 02114-2023

Phone/E-Mail: 617-918-1591 / mendoza.robert@epa.gov

Alternate Contact: Roger Janson
Address: Water Quality Management Unit (CWQ)
New England, Region 1
1 Congress Street, Suite 1100, Boston, MA 02114-2023

Phone/E-mail: 617-918-1621 / janson.roger@epa.gov

Trading Status: *No examples at present*

SOUTH CAROLINA

State Agency: State of South Carolina, Department of Water Resources

Agency Contact: Sally Knowles, Director
Address: 2600 Bull Street, Columbia, SC 29201

Phone/E-Mail: 803-898-4175 / knowlesc@columb32.dhec.state.sc.us

Federal Agency: US EPA Region 4

Agency Contact: Marshall Hyatt
Address: Water Quality Management Branch
61 Forsyth Street, Atlanta, GA 30303

Phone/E-Mail: 404-562-9304 / hyatt.marshall@epamail.epa.gov

Trading Status: *No examples at present*

SOUTH DAKOTA

State Agency: South Dakota Department of Environment & Natural Resources

Agency Contact: Kelli Buscher
Address: 523 E Capitol, Pierre, SD 57501
Phone/E-Mail: 605-773-3351 / kelli.buscher@state.sd.us

Federal Agency: US EPA Region 8

Agency Contact: Dr. Bob Erikson
Address: 999 18th Street, Denver, CO 80202-2405
Phone/E-Mail: 303-312-7027 / erickson.bob@epamail.epa.gov

Trading Status: *No examples at present*

TENNESSEE

State Agency: State of Tennessee, Water Pollution Control

Agency Contact: Dr. Sherry Wang
Address: L&C Floor Annex, 401 Church Street, Nashville, TN 37243-1534
Phone/E-Mail: 615-532-0656 / swang@mail.state.tn.us

Federal Agency: US EPA Region 4

Agency Contact: Marshall Hyatt
Address: Water Quality Management Branch
61 Forsyth Street, Atlanta, GA 30303
Phone/E-Mail: 404-562-9304 / hyatt.marshall@epamail.epa.gov

Trading Status: *No examples at present*

TEXAS

State Agency: State of Texas, Department of Water Quality

Agency Contact: Mel Vargas
Address: TNRCC, P. O. Box 13087, Austin, TX 78711-3087
Phone/E-Mail: 512-239-4812

Federal Agency: US EPA Region 6

Agency Contact: Troy Hill
Address: 1445 Ross Avenue, Dallas, TX 75202-2733
Phone/E-mail: 214-665-8022 / hill.troy@epamail.epa.gov

Trading Status: *No examples at present*

UTAH

State Agency: State of Utah, Department of Environmental Quality
Agency Contact: Bill Moellmer

Address: Division of Water Quality
288 North 1460 West, P. O. Box 144870
Salt Lake City, UT 84114-4870

Phone/E-Mail: 801-538-6146 / wmoellme@deq.state.ut.us

Federal Agency: US EPA Region 8
Agency Contact: Dr. Bob Erickson
Address: 999 18th Street, Denver, CO 80202-2405
Phone/E-Mail: 303-312-7027 / erickson.bob@epamail.epa.gov

Trading Status: *No examples at present*

VERMONT

State Agency: State of Vermont, Department of Environmental Conservation

Agency Contact: Pete Laflamme
Address: Water Quality Division
103 South Main Street, Waterbury, VT 05671-0408

Phone/E-Mail: 802-241-3770 / petel@dec.anr.state.vt.us

Federal Agency: US EPA Region 1
Contact: Lynne Hamjian
Address: Vermont State Program Unit (CVT)
EPA - New England, Region 1
1 Congress Street, Suite 1100, Boston, MA 02114-2023

Phone/E-Mail: 617-918-1601 / hamjian.lynne@epa.gov

Alternate: Roger Janson
Address: Water Quality Management Unit (CWQ)
New England, Region 1
1 Congress Street, Suite 1100, Boston, MA 02114-2023

Phone/E-mail: 617-918-1621 / janson.roger@epa.gov

Trading Status: *State is developing a state-wide phosphorus offset program for point sources and nonpoint sources.*

U. S. VIRGIN ISLANDS

State Agency: U. S. Virgin Islands
Agency Contact: Syed Syedali, Division of Environmental Protection
Address: 1118 Water Gut Homes, St. Croix, Virgin Islands 00820-5065
Phone/E-Mail: 340-773-0565 / ssyeda@viaccess.net

Federal Agency: US EPA Region 2
Agency Contact: Phil Sweeney
Address: Division of Environmental Planning & Protection
290 Broadway, 24th Floor, New York, NY 10007-1866
Phone/E-Mail: 212-637-3873 / sweeney.philip@epamail.epa.gov

Trading Status: *No examples at present*

VIRGINIA

State Agency: State of Virginia, Department of Environmental Quality
Agency Contact: Alan Pollack
Address: 629 East Main Street, P.O. Box 10009
Richmond, VA 23240-0009
Phone/E-Mail: 804-698-4002 / aepollack@deq.state.va.us

Federal Agency: US EPA Region 3
Agency Contact: Alison Wiedeman
Address: Chesapeake Bay Program Office
841 Chestnut Street, Annapolis, MD 21403
Phone/E-mail: 410-267-5733 / wiedeman.alison@epamail.epa.gov

Trading Status: *No examples at present. Proposed trade between Blue Plains Treatment Plant in Washington DC and State of Virginia where state would pay Blue Plains to reduce nutrient discharge to meet nutrient reduction goal in Virginia. See "Annual Report on the Virginia Water Quality Improvement Fund - Point Source Pollution Control," January 1998, Appendix C.*

WASHINGTON

State Agency: State of Washington Dept. of Ecology
Agency Contact: Dan Wrye
Address: P. O. Box 47600, Olympia, WA 98504-7600
Phone/E-Mail: 360-407-6459 / dwrye461@ecy.wa.gov

Federal Agency: US EPA Region 10, Water Division
Agency Contact: Claire Schary
Address: Mail code OI-085, 1200 Sixth Avenue, Seattle, WA 98101
Phone/E-mail: 206-553-8514 / schary.claire@epamail.epa.gov

Trading Status: *A trading pilot program on the Puyallup River is being developed.*

WEST VIRGINIA

State Agency: State of West Virginia, Department of Environmental Protection

Agency Contact: Steve Stutler
Address: Office of Water Resources, 1201 Greenbrier Street
Charlestown, WV 25311-1088

Phone/E-Mail: 304-558-2108 / sstutler@mail.dep.state.wv.us

Federal Agency: US EPA Region 3

Agency Contact: Francisco Cruze
Address: 1650 Arch St., Philadelphia, PA 19103
Phone/E-Mail: 215-814-5734 / cruze.francisco@epamail.epa.gov

Trading Status: *No examples at present*

WISCONSIN

State Agency: State of Wisconsin, Department of Natural Resources

Agency Contact: Duane Schuettepelz
Address: PO Box 7921, Madison, WI 53707-7921
Phone/E-Mail: 608-266-0156 / schued@dnr.state.wi.us

Federal Agency: US EPA Region 5

Agency Contact: Peter Swenson
Address: 77 West Jackson Boulevard, Chicago, IL 60604-3507
Phone/E-mail: 312-886-0236 / swenson.peter@epamail.epa.gov

Trading Status: *Three pilot projects for trading phosphorus are in the development stage - Red Cedar Watershed (contact Red Cedar Steering Committee), Fox-Wolf Drainage (contact Fox-Wolf 2000 program), and Rock River Basin (contact Rock River Watershed Partnership).*

WYOMING

State Agency: State of Wyoming, Department of Environmental Quality

Agency Contact: Beth Pratt
Address: 122 W. 25th Street, Cheyenne, WY 82002
Phone/E-Mail: 307-777-7079 / bpratt@misc.state.wy.us

Federal Agency: US EPA Region 8

Agency Contact: Dr. Bob Erickson
Address: 999 18th Street, Denver, CO 80202-2405
Phone/E-Mail: 303-312-7027 / erickson.bob@epamail.epa.gov

Trading Status: *No examples at present*

A6

Appendix A6: References

Adler, Robert W. *Integrated Approaches to the Water Pollution Problem: Lessons from the Clean Air Act*. 1998. At press.

Crutchfield, S. and D. Letson. "Feasibility of point-nonpoint source trading for managing agricultural pollutant loadings to coastal waters." 1994. *Water Resources Research*, Vol. 30, No. 10, pp. 2825-2836.

Daly, Herman E., *Beyond Growth: The Economics of Sustainable Development*, Beacon Press, 1996.

Dolan, Kari and Cameron Davis. *Saving Our Watersheds: A Field Guide to Watershed Restoration Using TMDLs*, National Wildlife Federation, January 1998.

Dudek, D., J. Goffman, D. Salon, S. Wade. *More Clean Air for the Buck: Lessons from the U.S. Acid Rain Program*. 1997. Environmental Defense Fund.

Environmental Defense Fund/VA Tech. *Proposal for nitrogen trading in Long Island Sound*. May 1998.

Environmental Law Institute. *Almanac of Enforceable State Laws to Control Nonpoint Source Water Pollution*. 1998. ELI project #970301.

Environmental Law Institute. *Enforceable State Mechanisms for the Control of Nonpoint Source Water Pollution*. 1997. ELI project #970300.

Minnesota Pollution Control Agency. *Pollutant Trading for Water Quality Improvement: A Policy Evaluation*. 1997.

National Wildlife Federation, *Waters at Risk*. May 1992.

Sax, Joseph, Robert Abrams, and Barton Thompson, ed., *Legal Control of Water Resources*, Second Edition, 1991 at 948.

Senjem, Norman. *Pollutant Trading: Theory and Practice*. 1997. Minnesota Pollution Control Agency.

Stavins, Robert. "Transactions Costs and Markets for Pollution Control." 1995. *Resources*, No.119.

U.S. EPA and USDA. *Clean Water Action Plan: Restoring and Protecting America's Waters*. 1998.

U.S. EPA. *Final Report of TMDL Federal Advisory Committee*. July 28, 1998.

U.S. EPA, Office of Water. *Draft Framework for Watershed-Based Trading*. 1996.

U.S. EPA, *National Water Quality Inventory*, 1996 Report to Congress.

U.S. EPA, Office of Water. *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. January 1993.

U.S. EPA. *Incentive Analysis for Clean Water Act Re-authorization: Point Source/Nonpoint Source Trading for Nutrient Discharge Reductions*. 1992.

U.S. EPA, Pub. No. 440/4-91, *Guidance for Water Quality Based Decisions: The TMDL Process*, April 1991.