

**Great Miami River Watershed
Water Quality Credit Trading Program
Operations Manual**

**Water Conservation Subdistrict
of
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Executive Summary

Tremendous improvements in surface water quality have been made over the last three decades. This progress has primarily been the result of reducing pollution from industry and wastewater treatment plants. Despite these gains, about half of the nation's rivers, streams, and lakes still fail to meet water quality standards. To address the remaining water quality challenges, new incentive-based strategies will be necessary. Water quality credit trading is an innovative, market-driven way of spending every dollar to improve surface water quality in the best way possible.

Water quality credit trading utilizes a watershed framework to improve water quality. For example, a downstream wastewater treatment plant is facing expensive upgrade requirements which will require them to reduce the amount of pollutants they discharge as allowed in their National Pollutant Discharge Elimination System permit. They could invest money upstream that will fund less expensive agricultural management practices and achieve better water quality. Because the improvements are made upstream the quality of the water that flows past the downstream treatment plant will improve and so does all of the water in between. The customers of the wastewater treatment plant benefit from lower costs because expensive upgrades are avoided and everybody benefits from cleaner water. The Water Conservation Subdistrict of The Miami Conservancy District is proposing this Water Quality Credit Trading Program so that the Great Miami River Watershed and other downstream receiving waters can benefit from this innovative strategy.

This Operations Manual addresses all aspects of the Trading Program including program development, implementation, evaluation, and adaptation.

1 Program Background

This section provides background information on the Great Miami River Watershed, a description of the Great Miami River Watershed Water Quality Credit Trading Program (Trading Program), and the Trading Program's measures of success and benefits. The Water Conservation Subdistrict (WCS) of The Miami Conservancy District (MCD) is proposing this Water Quality Credit Trading Program.

1.1 Great Miami River Watershed

The Great Miami River Watershed is located in southwestern Ohio and drains an area of nearly 4,000 square miles (see Appendix A - Map 1) including portions of fifteen Ohio counties. Principal tributaries to the Great Miami River (170.3 miles in length) include the Stillwater River and the Mad River. Portions of the Stillwater River and Greenville Creek have been designated by Ohio as State Scenic Rivers. The Great Miami River originates just above Indian Lake in Logan County, Ohio and outlets to the Ohio River west of Cincinnati. Downtown Dayton, Ohio marks the confluence of the Mad and Stillwater Rivers with the Great Miami.

The Great Miami River Watershed has a population of 1.5 million people and more than 75% of the population resides in urban areas. Major urban areas include metropolitan Dayton and a portion of Cincinnati, as well as Hamilton, and Troy. Approximately 83% of the land within the Watershed is used for agriculture, primarily row-crop production of corn, soybeans, and wheat. Typical livestock include swine, cattle, and poultry. Residential, commercial, and industrial lands account for approximately 12% of land use in the watershed, with the remaining area consisting of forests (4%) and water bodies or wetlands (1%). Major industries located in the Watershed produce automobile parts, chemicals, household goods, paper products, and processed foods and beverages.

The U.S. Environmental Protection Agency has designated much of the buried valley aquifer system underlying the Great Miami River Watershed as a Sole Source Aquifer. The permeable of sand and gravel deposits within the buried valley aquifer result in the transmission of large quantities of water and are readily recharged due to the lack of extensive impermeable layers. Many municipalities have located their well fields on top of the buried valley aquifer. The connection between surface and ground water is so extensive that Ohio EPA has designated a portion of Dayton's drinking water wells, which serve more than 440,000 consumers, as producing "Ground Water Under the Influence of Surface Water." Private wells and smaller public water systems throughout the Great Miami River Watershed also draw water from the aquifers.

According to the Ohio Environment Protection Agency (Ohio EPA), of over 1000 stream miles assessed in the Great Miami River Watershed, 613 (58.8%) meet the aquatic life standards for their aquatic use designation; 206 stream miles (19.8%) partially attain the aquatic life standards while 223 stream miles (21.4%) do not meet the aquatic life standards due to water quality impairments (see Appendix A - Maps 2-5). According to reports by the Water Quality Lab at Heidelberg College, 9801 metric tons of nitrates were discharged from the Great Miami River into the Ohio River in 2001. The condition of the Great Miami River Watershed is crucial to the

health of the streams within its boundaries as well as the Ohio River and other receiving waterbodies downstream – including the Gulf of Mexico.

The Ohio EPA has developed a schedule for issuing Total Maximum Daily Loads (TMDLs) in watersheds with substantial impairment (see Appendix A - Map 6). Nearly all subwatersheds in the Great Miami River Watershed are scheduled for TMDL development including the Mad River, Twin Creek, and the Great Miami River. TMDL development began in the Stillwater Watershed in 2001 and was approved by the United States Environmental Protection Agency (U.S. EPA) in 2004. The Ohio EPA 303(d) List of Prioritized Impaired Waters (Category 5) has subwatersheds of the Stillwater River listed as highest priority in Ohio for TMDL Development.

The main source of impairment in the Great Miami River Watershed is nonpoint source pollution and includes: nutrient enrichment in streams, excess sediment in waterways, and habitat alterations. Nonpoint source pollution is an issue for both urban and agricultural areas. Agricultural activities often result in degradation or removal of streamside vegetation that allows sediment, chemicals, pathogens, and nutrients to enter the stream. Urban areas contribute to nonpoint source pollution through storm water runoff from impervious surfaces and from exposed soil on construction sites. Sedimentation also impacts the capacity of streams and impairs The Miami Conservancy District's flood protection system that continuously protects more than a million people and several billion dollars of property.

1.2 Overall Program Description

Water quality credits are generated from pounds of phosphorus (TP) and pounds of nitrogen (TN) that are prevented from discharging into the Great Miami River Watershed's rivers and streams. Water quality credits only originate from an activity undertaken voluntarily i.e. not otherwise required by local, state, or federal law. Water quality credits may be purchased by permitted dischargers, who become eligible buyers, for the purpose of complying with regulations related to the particular nutrient for which the credit is generated.

Eligible buyers are public and private entities that (1) hold a state-issued National Pollutant Discharge Elimination System (NPDES) permit, (2) have their NPDES permit modified to reflect their participation in the Trading Program and (3) participate in funding WCS's administrative and analytical costs for the Trading Program.

A trade occurs when water quality credits are transferred to an eligible buyer for their use to comply with an NPDES permit. The cost of a water quality credit is determined by the market. In general, the cost of a water quality credit is likely to be the sum of expenditures for the project (including applicable capital, operating, administrative and ongoing maintenance costs) divided by the number of credits.

Water quality credits will mainly be generated by implementing management practices that reduce the discharge of nutrients from agricultural land uses. Other opportunities to generate credits may include urban storm water management or home sewage treatment system upgrades - that go beyond what is required by law. The specific agricultural management practices that generate credits will be proposed by local soil and water conservation professionals. They will

work directly with agricultural producers to identify and propose management practices that work best to accomplish the desired nutrient reduction. Reductions will be verified through inspections and by conducting water quality monitoring at a portion of the project sites. Water quality will also be measured with a continuous monitoring program on a subwatershed scale.

An advisory group, with broad-based stakeholder representation, will develop project criteria and then use it to review proposals and make recommendations for funding specific projects. The criteria will include consideration of the existence of an approved watershed action plan and/or an approved TMDL for the area of the proposed project.

1.3 Program Measures of Success and Benefits

There are numerous direct and ancillary benefits measured to determine the success of the Trading Program. Measures of success for the Trading Program include:

- Attainment of Ohio's water quality standards.
- Reduction (or an increased rate of reduction) in nutrient loading to rivers and streams.
- Improved biological index scores.
- Increased money invested and money saved.

Direct benefits include:

- Increased use of management practices that benefit water quality.
- More sustainable operations with lower costs for agricultural producers.
- Reduced compliance costs for wastewater treatment plants.
- Increased number of stream miles that meet Ohio's water quality standards.
- Increased recreational use of the Great Miami River Watershed's rivers and streams.

The Trading Program will also result in many ancillary environmental benefits that would not be realized from just decreasing pollutant discharges by upgrading wastewater treatment plant technology. There will be an increase in the collection of water quality data that can be utilized throughout the Watershed by other organizations and projects. Although NPDES permits are scheduled to be renewed on a five year rotation, the Ohio EPA has resource limitations which prevent the collection of data every five years. To ensure that a comprehensive and effective water quality management strategy is being implemented, it is necessary to have access to data that is as current as possible.

The Trading Program utilizes trading ratios to insure that the benefit to water quality is more than what would occur from technology upgrades at treatment plants. In addition, there are incentives in the Trading Program for eligible buyers to fund nutrient reduction efforts in advance of their permit requirement. These strategies produce ancillary benefits that result in better water quality sooner. The following table lists other potential ancillary benefits.

Table 1. Potential Ancillary Environmental Benefits

Benefits	Treatment Plant Upgrade	Agriculture Management Practices via Trading
Pollutant of concern reduced	Yes	Yes
Other pollutants reduced	?	Yes
Habitat improved	No	Yes
Canopy enhanced	No	Yes
Stream banks stabilized	No	Yes
Flow velocity decreased	No	Yes
Wetlands created	No	Yes
Floodplains preserved	No	Yes
Assimilative capacity increased	No	Yes

2 Program Development

This section will describe how the Trading Program was developed including the results of an economic analysis that was done to predict if a program would be viable in this watershed, and how community members helped shape the Trading Program.

2.1 Determining the Economic Viability of a Trading Program

Many basic economic analyses have predicted that nonpoint source trading is viable. Unfortunately, direct comparisons of agricultural management practices with wastewater treatment technologies may result in a water quality trading scenario that is too optimistic. For example, these analyses may fail to include costs for trading program administration or water quality sampling. Without consideration of all the costs of a trading program an analysis can result in an inaccurate portrayal of the viability of trading within a watershed.

In addition, the specific regulatory drivers must be considered to determine if a water quality trading program is economically viable. Different regulations could require different levels of investment by the regulated community to achieve compliance. For example, achieving TMDL waste load allocations for phosphorus alone may be substantially less expensive than achieving both phosphorus and nitrogen reductions that are needed to meet discharge limits associated with nutrient water quality criteria.

An analysis to determine the economic viability of a point to nonpoint source water quality credit trading program for the Great Miami River Watershed was conducted using nutrient water quality criteria as the principal driver. Nutrient criteria and discharge limits are anticipated for the Great Miami River Watershed in 2007 (see Appendix B – Ohio EPA Correspondence). WCS engaged a private consultant with international water quality credit trading expertise, Kieser and Associates, to conduct the analysis. The analysis sought to answer two critical questions. Is there an adequate supply of agricultural nonpoint source reductions of phosphorus and nitrogen to meet future point source demand? Are the cost differentials between point source upgrades and nonpoint source management practices sufficient to support a trading program? The economic analysis addressed these questions by:

- Conducting a nonpoint source loading analysis to assess agriculture credit supply in each of four major subwatersheds of the Great Miami River Watershed (Lower Great Miami River, Mad River, Upper Great Miami River, and Stillwater River).
- Comparing the costs of incremental point source load reductions via traditional treatment plant technologies to the costs of comparable load reductions by agricultural nonpoint source management practices.
- Analyzing cost savings and load reductions potentially achieved through a proposed point to nonpoint source trading program.

To summarize the findings of the analysis:

- With the proposed trading ratios, there will be a significant demand for phosphorus and nitrogen credits to accommodate point source reductions for future discharge limits.
- There will likely be ample supply of phosphorus credits from agriculture to meet most foreseeable trading requests with some limited exceptions in select headwater areas.

- Point to nonpoint source trading in the Great Miami River watershed offers significant cost savings (\$314M - \$384.7M) during a 20-year period when compared to the expense of mandatory treatment plant upgrades (totaling \$422.5M) for traditional treatment-based, regulatory approaches.

The projected savings of \$314M to \$384.7M does not include the administrative or water quality monitoring costs over the 20-year period of the analysis. Furthermore, if regulated dischargers choose to meet nutrient reductions through treatment improvements at their plants, expenditures for those improvements may not occur for several years following the implementation of the new requirements. However, during this period the Trading Program is designed to encourage participation which will lead to early nutrient reductions. Eligible buyers seeking Investor-status will begin to expend money on trading earlier than the 20-year period that was the subject of the economic analysis (see Section 3.2.1 for more information on Investor-status).

In order to provide a more comprehensive cost comparison that includes expenditures during the startup period, it is assumed that the Trading Program startup will precede major expenditures for nutrient criteria compliance by five years. As shown in Table 2, even considering the additional administrative and analytical costs, the projected cost savings associated with the Trading Program are very significant and expected to exceed \$300,000,000.

Table 2. Comparison Including All Trading Program Costs

Net point to nonpoint savings projected over 20-year comparative period	\$314M to \$384.7M
Twenty-year administration and subwatershed monitoring (assume \$230,000 per year)	-\$4.6M
Twenty-year management practice monitoring (assume \$25,000 per year)	-\$0.5M
Five-year startup project funding and management practice monitoring by Investors (assume \$500,000 per year)	-\$2.5M
Five-year startup administration and subwatershed monitoring (assume \$220,000 per year)	-\$1.1M
Net potential savings from Trading Program	\$305.3M to \$376M

2.2 Public Participation

Initially, over 30 meetings were held between WCS and county soil and water conservation district (SWCD) boards, joint boards, wastewater treatment plant operators, and community-based watershed organizations throughout the Great Miami River Watershed to solicit input which was then used to develop the Trading Program. Numerous meetings were also held with the Ohio Department of Natural Resources (Ohio DNR), the Ohio EPA, the U.S. EPA Headquarters and Region V, the Ohio River Valley Water Sanitation Commission (ORSANCO), the Ohio Environmental Council (OEC), the Ohio Farm Bureau Federation and the United States Department of Agriculture's Natural Resources Conservation Service (NRCS). Partnerships were formed with many of these organizations to help implement the Trading Program.

3 Key Program Elements

This section highlights the key elements of the Trading Program. The key elements include details on credits, the Insurance Pool of credits, how trades occur, who is eligible to participate, trading ratios, and how the Trading Program will be managed.

3.1 Credits

One credit is equal to one pound of nutrients that are prevented, through a voluntary action, from discharging into the Great Miami River Watershed's rivers and streams. One pound of phosphorus (TP) removed is equal to one credit for phosphorus and one pound of nitrogen (TN) removed is equal to one credit for nitrogen. Credits are only generated as a result of a voluntary activity (i.e. not otherwise required by local, state, or federal law) implemented under this Trading Program. Water quality credits may be generated by projects funded through a variety of sources such as the Trading Program Project Fund, the State Revolving Fund, or grant dollars. Most credits will be generated by projects that are funded by eligible buyers in order to comply with a discharge limit that is related to the nutrient for which the credit is generated.

The Trading Program does not recommend specific activities that generate credits but instead relies on agricultural producers, local soil and water conservation professionals, and members of community-based watershed organizations to identify projects that accomplish a desired nutrient reduction. Activities that may generate credits include agriculture management practices, urban storm water management practices, or home sewage treatment system upgrades - that go beyond what is required by law. A county SWCD must be a partner in all projects proposed for credits.

The cost of a water quality credit is determined by the market. In general, the cost of a credit is likely to be the sum of expenditures for the project (including applicable capital, operating, administrative, and ongoing maintenance costs) divided by the number of credits.

The number of water quality credits generated from a specific management practice is determined using a Load Reduction Spreadsheet that is also used in Illinois, Indiana, Michigan, and by the staff of the Ohio EPA and the Ohio DNR. The determination of the number of credits generated will be conducted by a qualified soil and water conservation professional that will also periodically inspect the management practice. As long as the management practice is operated in a manner consistent with the estimate, the estimated number of credits will be allocated to the management practice.

A management practice will generate credits only after it is installed. It is the position of the U.S. EPA that credits used to meet NPDES permit requirements must be generated during the permit's compliance averaging time of the eligible buyer's permit limit. If a management practice were to fail, compliance issues may arise for the NPDES permit holder who is utilizing the credits. Management practices may fail due to unusual weather or other circumstances. The SWCD staff that submitted the project is also responsible for inspection of the management practice and will determine if the management practice has failed.

The Trading Program incorporates two strategies to assure on-going NPDES permit compliance in the event of the failure of a management practice: 1) A Management Practice Contingency Plan and 2) An Insurance Pool of credits. The Management Practice Contingency Plan assures a timely and coordinated response to the failure of a management practice. The Plan will be developed and maintained in collaboration with the Ohio Department of Natural Resources. The Insurance Pool of credits is discussed in the following section.

Contractual agreements currently used by soil and water conservation districts and the NRCS contain provisions related to the recovery of funds from failed projects. Agreements for projects receiving funds in this Trading Program will include similar provisions.

3.1.1 Insurance Pool of Credits

WCS will manage an Insurance Pool of credits to be used as a “guarantee” for credits being generated for eligible buyers. As previously mentioned, the Insurance Pool is one of two strategies used to insure that an eligible buyer is not at enforcement risk due to a possible failure of a management practice. The Insurance Pool will be operated according to guidelines developed in consultation with the Ohio EPA, the Ohio DNR, and the U.S. EPA. The guidelines will anticipate the following uses:

1. Credits may be withdrawn from the pool, if necessary, to replace credits that are lost due to a failed management practice. The SWCD staff responsible for oversight of the management practice will make the determination that a management practice has failed.
2. Credits may be sold to generate funds for projects that would yield additional pollutant reductions.
3. Credits may be sold to generate funds to cover Trading Program costs.

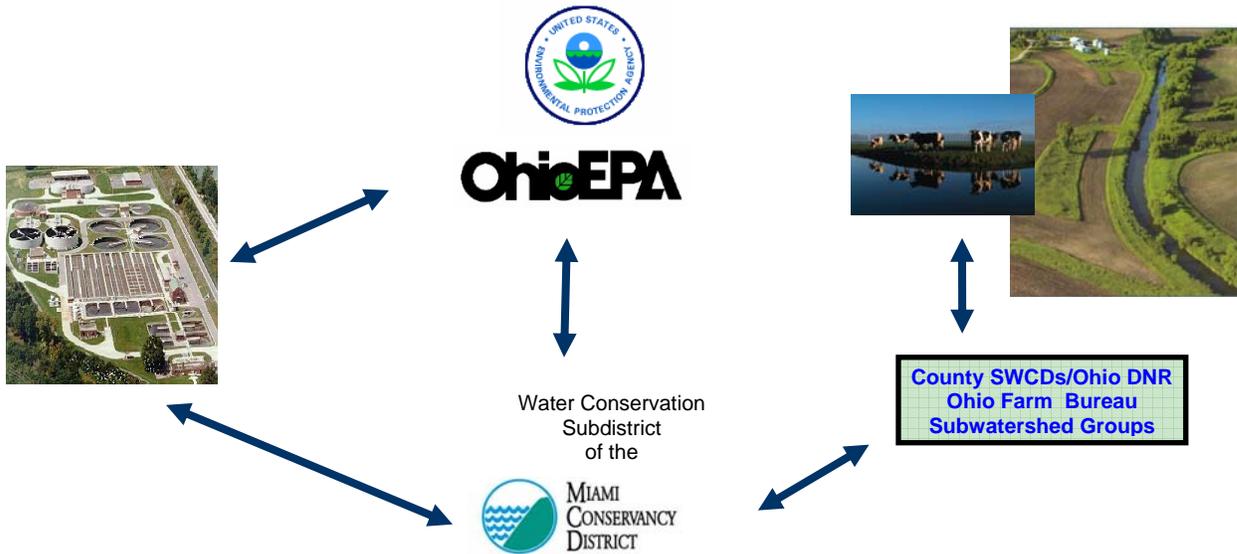
A portion of the pooled credits originate from projects that are funded by “Contributor” status eligible buyers. For Contributors with discharges to attaining water, one of every two required credits is directed to the Insurance Pool. For Contributors discharging to non-attaining water, one of every three required credits is directed to the Insurance Pool. In addition, water quality improvement projects subsidized by other sources of funds such as the Section 319 Nonpoint Source grant program may generate credits for deposit in the Insurance Pool. WCS will actively pursue credits to insure the Insurance Pool maintains adequate credits.

Credits deposited to the Insurance Pool will have a life of five years from their date of deposit. If a pooled credit is not used within five years from its date of deposit, that credit will be retired.

3.2 Trades

A trade occurs when the Trading Program transfers water quality credits by agreement to an eligible buyer who uses them to comply with their NPDES permit. See Figure 1 for an illustration of the overall flow of water quality credit trading. See Section 3.3 for a detailed description of Program Management.

Figure 1 – Flow of Trades



A trade may occur anywhere within the Great Miami River Watershed but eligible buyers may only use water quality credits that are generated upstream from their point of discharge. This assures that there is a water quality benefit at the eligible buyer’s point of discharge. However, if a U.S. EPA-approved TMDL provides for a group waste load allocation, trading may occur within the group (regardless of location) to meet the TMDL requirements.

3.2.1 Buyer Eligibility and Trading Ratios

Eligible buyers are primarily public and private wastewater treatment plants who must (1) hold a state-issued NPDES permit, (2) have their NPDES permit modified to reflect their participation in the Trading Program and (3) participate in funding WCS’s administrative and analytical costs for the Trading Program. Eligible buyers that participate in the Trading Program before NPDES compliance requirements for nutrients are called “Investors.” Eligible buyers that choose to participate in the Trading Program but not in advance of their regulatory requirements are called “Contributors”. All potential trading program buyers should contact WCS to initiate the process of becoming a Trading Program participant.

Trading ratios indicate the pounds of TN or TP reduced (credits that are generated) using an upstream management practice in relation to the pounds that would be required to be reduced from a treatment plant using on-site treatment upgrades. The Trading Program utilizes trading ratios so as to create a financial incentive for eligible buyers to participate in the Trading Program sooner and insure that water quality benefits are maximized.

Investors voluntarily participate in the program early, which earns them the right to trade at more favorable water quality credit trading ratios for all subsequent permits where credits are applied to achieve compliance. Contributors are not eligible for the reduced trading ratios available to Investors. Nutrients have consistently been cited as a source of impairment of many stream and river miles within the Great Miami River Watershed and this early participation will generate immediate water quality benefits for the Watershed. Furthermore, by beginning the management

practices sooner, the practices will be more reliable for subsequent use in generating credits for permit compliance.

For example, prior to any regulatory obligation to reduce TP discharges, a wastewater treatment plant provides funds for project(s) that reduce the upstream discharge of TP by 1,000 pounds. Discharge limits are then imposed through the wastewater treatment plant’s permit that require a 1,000 pound TP reduction. Since the wastewater treatment plant participated in advance of their regulatory requirement to reduce TP, they receive “Investor” benefits for the early 1,000 pound reduction. Specifically, the wastewater treatment plant may trade 1,000 pounds (credits) from the ongoing project(s) at more favorable ratios. Furthermore, if this wastewater treatment plant continuously participates in the Trading Program they may apply this benefit during all subsequent permit terms. Wastewater treatment plants that participate as Investors may accumulate this trading ratio benefit up to 100% of the permit-required reductions of TP and TN. This affords the Investor maximum benefit over time. If the wastewater treatment plant accumulates less than 100%, the balance of the required reductions are subject to higher trading ratios. See Appendix C for model draft language for inclusion in Investor NPDES permits.

Trading ratios are also dependent on the water quality attainment status at the eligible buyer’s discharge point. An eligible buyer that discharges to impaired waters must acquire credits at a higher level than an eligible buyer who discharges to fully attaining waters. For the purpose of defining an eligible buyer’s trading ratio, the water quality attainment status is determined based on Ohio EPA’s Designated Aquatic Life Uses.

Table 3 shows the trading ratios that vary depending on the status of the eligible buyer and the water quality at the buyer’s discharge point.

Table 3. Trading Ratios

Eligible Buyer Status	Ratio for Buyer with Discharge to Fully Attaining Waters	Ratio for Buyer with Discharge to Impaired Waters
Investor*	1:1	2:1
Contributor	2:1	3:1

*Investor ratios apply to quantity of TN and TP equal to voluntary early participation by the eligible buyer.

3.3 Program Management

The Trading Program is being established by WCS in cooperation with permitted dischargers, agricultural producers, the Ohio EPA, county soil and water conservation districts, the Ohio DNR, and the Ohio Farm Bureau Federation.

3.3.1 Water Conservation Subdistrict

WCS will act as a third-party broker and serve the collective interests of all Trading Program partners. In this role WCS will:

1. Act as a broker for water quality credit trades.

2. Implement and manage a subwatershed water quality data collection program.
3. Issue the Requests for Proposals for projects.
4. Facilitate the Project Advisory Group review of project proposals.
5. Enter into agreements with SWCDs for project implementation and inspection.
6. Track and issue reports on credit management.
7. Enter into agreements with Eligible Buyers for credit allocation.
8. Maintain internet-accessible information on Trading Program activity.
9. Manage the Insurance Pool of credits.
10. Promote the Trading Program.
11. Serve as a liaison between all Trading Program stakeholders.
12. Modify the Trading Program according to the Adaptive Implementation approach (see Appendix D).

The Miami Conservancy District and its subdistricts, including the Water Conservation Subdistrict, have a long history of successful partnership with local, regional, state, and federal agencies. MCD's efforts in the Great Miami River Watershed include flood protection, surface and groundwater monitoring, greenspace preservation, development of recreation areas, and river corridor restoration and protection. Additional qualifications to serve as a broker of water quality credit trades include:

- Approved Official Plan (see Appendix E).
- Authority to operate across the entire watershed.
- Scientific expertise.
- Administrative ability to facilitate trading.
- Relationships with community-based watershed organizations.
- Leader of an urban storm water management collaboration.
- Knowledge of citizen and community water resources priorities.
- Leadership of forums that engage citizens on water resources issues.
- Management of existing integrated water resource programs.
- Recipient of a U.S. EPA Targeted Watershed grant.
- Organizational history of building and operating wastewater treatment plants.

3.3.2 Ohio Environmental Protection Agency

The Ohio EPA will work with permitted dischargers to modify their NPDES permits so they may participate in the Trading Program. Ohio EPA will also work with WCS to coordinate water quality data collection and support an adaptive implementation approach to the Trading Program. The Ohio EPA will periodically audit WCS records relative to the generation and allocation of credits. The Ohio EPA may also provide grant or State Revolving Fund assistance to promote Ohio's water quality attainment goals.

3.3.3 Soil and Water Conservation Districts

The SWCD in each county has staff with scientific expertise, practical experience, and community familiarity. They will be the critical link between the agricultural producers and the Trading Program. Each SWCD office will have the opportunity to identify, assess, and implement management practices that generate credits. The SWCD will work with agricultural

producers to identify potential projects and propose them for funding. Once a project is approved, the SWCD will certify project implementation and periodically inspect the project to insure that it is functioning as designed. A portion of the projects are subject to field testing that includes water quality monitoring which will be conducted by the SWCD that implements the project. If a project is subject to water quality monitoring, additional funds will be available to cover the monitoring costs for that project, and the monitoring requirements will be stated in the contract that implements the project.

3.3.4 Ohio Department of Natural Resources

The Ohio DNR utilizes a Load Reduction Spreadsheet that evaluates management practices and estimates their nutrient load reduction. The ODNR will provide training to soil and water conservation professionals in the Great Miami River Watershed on how to use this Spreadsheet. Estimates from this Spreadsheet will be the basis for submitting projects to qualify for credits in the Trading Program. The Ohio DNR also provides support and guidance to county SWCDs on issues related to management practice implementation and assessment. On an annual basis the Ohio DNR will review a portion of the management practices implemented under the Trading Program and provide a report to the Ohio EPA and WCS on the effectiveness of Program procedures as well as any recommendations for Trading Program improvement. The Ohio DNR will also cooperate in response to management practices that fail.

3.3.5 Ohio Farm Bureau Federation

The Ohio Farm Bureau Federation has developed a program along with the Ohio Agricultural Environmental Assurance Alliance called the Producer Environmental Self-Assessment Program. This program provides tools to agriculture producers so they can voluntarily conduct an environmental assessment of their operation and understand what solutions are available to address natural resource concerns. The Trading Program complements the Self-Assessment Program by potentially providing the funding necessary to implement these solutions. The Ohio Farm Bureau Federation will hold trainings on how producers can conduct the assessment throughout the Great Miami River Watershed.

3.4 Program Evaluation

This section provides information on how the Trading Program will be evaluated and how improvements will be made as a result of the evaluation.

3.4.1 Analytical Validation of Management Practice Performance

In order to properly validate the Trading Program and its impact on water quality, analyses will be conducted. A portion of the projects are subject to field testing that includes water quality monitoring. Data collection will be conducted according to a quality assurance project plan. The Trading Program will target to collect project-specific data on a minimum of 5% of the total number of projects and strive to test 10% of all projects. If projects utilize match funding that requires water quality testing to validate the project, such as Section 319 grant funds, that data may be used to meet Trading Program targets.

On a periodic basis, an independent review will compare the results of analytical testing with the estimated water quality credit values. Based upon the results of the review, the method used to determine the number of credits may be refined or changes may be recommended in how the Trading Program operates.

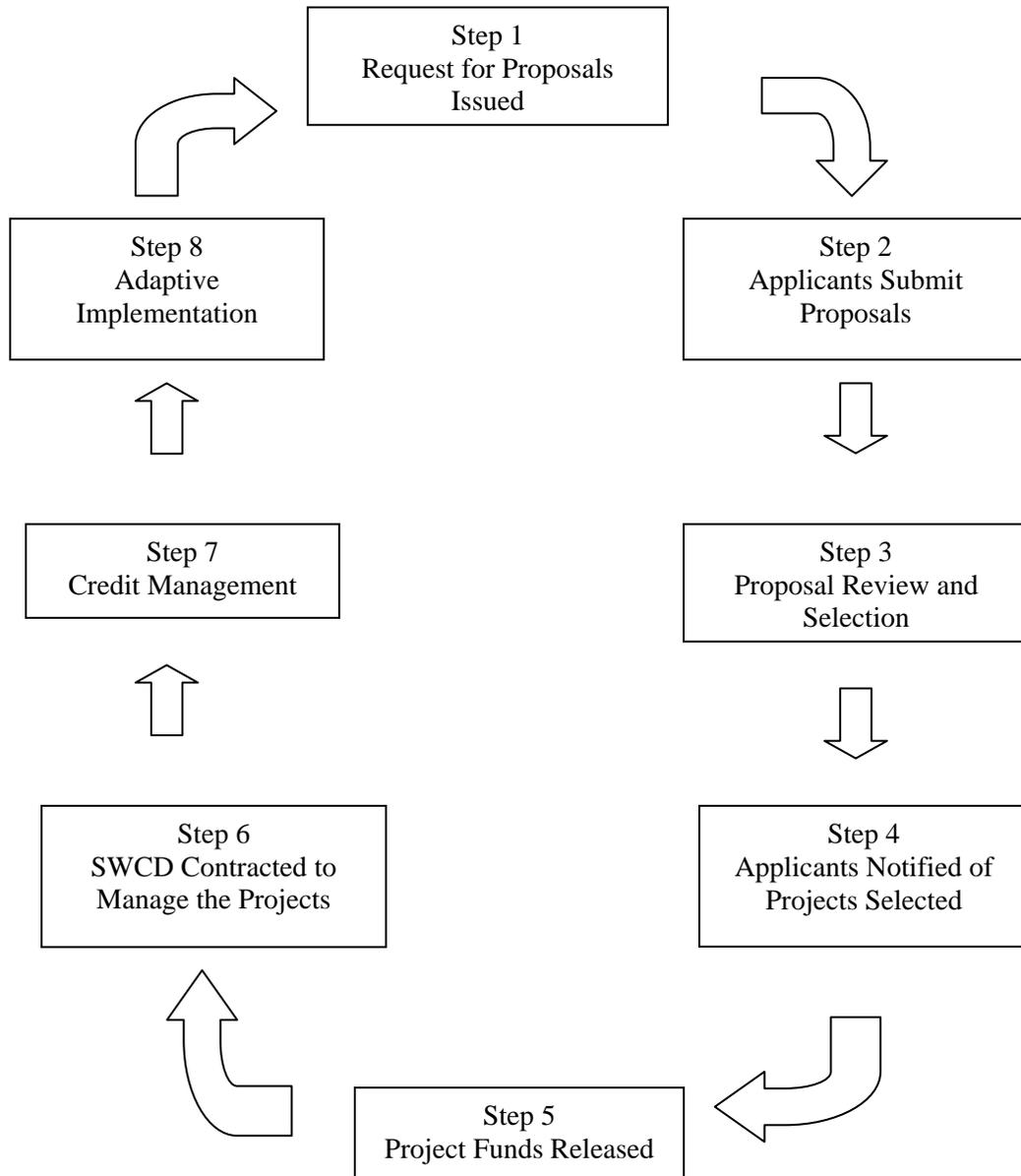
3.4.2 Analytical Validation of Overall Trading Program Performance

Nutrient data will be collected at a larger scale to assess the overall effectiveness of the Trading Program within the Watershed. WCS will implement a subwatershed water quality monitoring program that collects samples on a continuous basis at four different locations throughout the Watershed. Data collection will be conducted according to a quality assurance project plan. The monitoring locations will be selected so they provide an indication of changes in nutrient loading among the four major subwatersheds of the Great Miami River Watershed. In addition to providing an indication of the effectiveness of the Trading Program this data will fill a large gap in information necessary to more fully understand the role of nutrients within the Great Miami River Watershed and its contribution to downstream nutrient loading.

4 Trading Program Process

This section will discuss each of the steps or activities that occur during the Trading Program. See Figure 2 for a flow chart of the ongoing activities associated with the Trading Program.

Figure 2. Trading Program Process Detail



4.1 Step 1 - Request for Proposals

The first step to the ongoing Trading Program process is to find qualified projects to generate credits. WCS will periodically issue a Request for Proposals (RFP) to announce that funds are available for qualified projects (see Appendix D for more information on qualified projects). The RFP will include the amount of funding available, the criteria by which projects will be selected, and deadlines for submitting proposals.

RFPs will be issued based on the available funding, the number of potential projects, the demand for credits, and the capacity of SWCDs to implement additional projects. A SWCD must be the applicant for funds.

4.2 Step 2 - Applicants Submit Proposals

Project proposals will be submitted and must address the criteria specified in the RFP. All proposals will clearly demonstrate the applicant's commitment to support project implementation and meet on-going inspection and reporting requirements.

4.4 Step 3 - Proposal Review and Project Selection

The Project Advisory Group provides broad stakeholder involvement for the operation of key aspects of the Trading Program. This Group will develop the criteria used to evaluate the projects then review and select projects based on those criteria. WCS will facilitate the review and selection process (see Section 5.2 for more information on the Project Advisory Group).

4.5 Step 4 - Applicants Notified of Projects Selected

WCS will notify all applicants of the results of the selection process.

4.6 Step 5 - Project Funds Released

The Trading Program Project Fund* provides funding for management practices that generate credits.

*The specific financial structure for the Project Fund has not been determined as of February 2005. Details on the Project Fund structure and administration will be added to subsequent versions of this Manual.

4.7 Step 6 - SWCD Contracted to Manage the Project

As broker of the Trading Program, WCS will contract with the successful SWCD for project implementation. The SWCD will enter into a project agreement with the agricultural producer that is responsible for the operation and maintenance of the management practice(s). This process will be similar to processes already in place and utilized by existing grant and cost-share programs.

In addition to overseeing project implementation, SWCDs will conduct inspections and submit an annual report verifying the status of the management practice. When necessary, the SWCD will also be responsible for conducting water quality monitoring (see Section 3.4.1 for information on monitoring).

4.8 Step 7 - Credit Management

As credit broker, WCS is responsible for:

- Tracking credit generation by maintaining an updated inventory of all management practices and their inspection records to validate the ongoing generation of the credits.
- Allocating credits to participating eligible credit buyers.
- Preparing and submitting an annual report documenting the generation and status of water quality credits. The report will be made available to participating eligible credit buyers, the Ohio EPA, and the U.S. EPA.

4.9 Step 8 - Adaptive Implementation

The Ohio EPA and the Ohio DNR will establish a Load Reduction Workgroup to facilitate adaptive implementation of the Trading Program. The Workgroup will be responsible for the periodic evaluation and enhancement of the Load Reduction Spreadsheet. The Workgroup will receive project-specific information on management practices that generate credits, load reduction estimates, and associated analytical data. The Workgroup will also:

- Direct and oversee an evaluation of the accuracy of reduction estimates made for the Trading Program every two years.
- Provide timely support to soil and water conservation professionals evaluating management practices that are not included in the current Spreadsheet.
- Consult with the Ohio EPA, Division of Environmental and Financial Assistance staff regarding management practices that are not addressed by the Spreadsheet but are proposed to be funded by the State Revolving Fund. Update the State Nonpoint Source Plan to include newly added management practices on an annual basis.
- Schedule periodic training in the use of the Spreadsheet for soil and water conservation professionals.

See Appendix D for additional information on adaptive implementation.

5 Pre-Program Activities

Several activities must be completed prior to the startup of the Trading Program. Once completed, details will be added to subsequent versions of this manual.

5.1 Create Project Fund

The Trading Program Project Fund provides money to implement management practices that generate credits. It is anticipated that a variety of funding sources may be used to capitalize the Project Fund. Funding sources may include the State Revolving Fund, bond proceeds, or direct contributions. Each funding source may have specific funds management requirements.

Costs for Trading Program administration and subwatershed water quality monitoring are paid directly to WCS by the eligible buyers and are not paid from the Project Fund.

5.2 Convene the Project Advisory Group

The Project Advisory Group provides broad stakeholder involvement in the operation of key aspects of the Trading Program. The Group includes representation from water quality credit buyers and sellers as well as state and local agencies that have extensive knowledge of, and promote, conservation practices in the agricultural community. Representatives of the Ohio EPA and the U.S. EPA will be asked to participate in all meetings of the advisory group but due to their regulatory role relative to the Trading Program they will not directly participate in project selection. Membership in the advisory group will be composed of representatives of:

1. Wastewater Treatment Plants
2. Agricultural Producers
3. Water Environment Federation/Ohio Water Environment Association
4. Ohio Farm Bureau Federation
5. County Soil and Water Conservation Districts
6. Ohio Department of Natural Resources
7. United States Department of Agriculture
8. Community-Based Watershed Organizations

5.3 Develop Project Criteria

The Project Advisory Group will develop project criteria that will be used to review and select projects for funding. The criteria will address the inclusion or exclusion of projects that receive funding from other public sources such as the Farm Bill or other nonpoint source related programs. The criteria will also include the consideration of the existence of a state-endorsed watershed action plan and/or an approved TMDL for the area of the proposed project. The criteria will provide the foundation for a Project Application form that will be used by those applying for project funding.

5.4 Determine Trading Ratios for Eligible Buyers

Each eligible buyer is evaluated to determine what trading ratio will be used during their trades. Trading ratios indicate the pounds of TN or TP (credits) that are generated using a management practice to prevent a discharge in relation to the pounds that would be required to be reduced from a treatment plant using on-site treatment upgrades. Factors include when the eligible buyer entered into the Trading Program and the status of the water quality at their point of discharge (see Section 3.2.1 for additional discussion of trading ratios).

5.5 Develop Agreements Between WCS and Eligible Buyers

To participate in the Trading Program eligible buyers must enter into an agreement with WCS that addresses program administration and subwatershed water quality monitoring costs. The Trading Program separates funding for management practices from the funding the program administration and subwatershed water quality monitoring. This separation will promote an open and competitive market.

5.6 Modify Eligible Buyer's (NPDES) Permit

Each eligible buyer will work with the Ohio EPA to have their NPDES permit modified so they may participate in the Trading Program.

5.7 Conduct Load Reduction Spreadsheet Training

The Ohio EPA and the Ohio DNR currently use the Load Reduction Spreadsheet to estimate nutrient load reductions for a variety of agricultural management practices. In order to submit a project for funding through the Trading Program SWCD staff is required to use the Spreadsheet to evaluate the management practice(s). The Ohio DNR, Division of Soil and Water Conservation staff will train SWCD staff how to use the Spreadsheet.

5.8 Develop Management Practice Contingency Plan

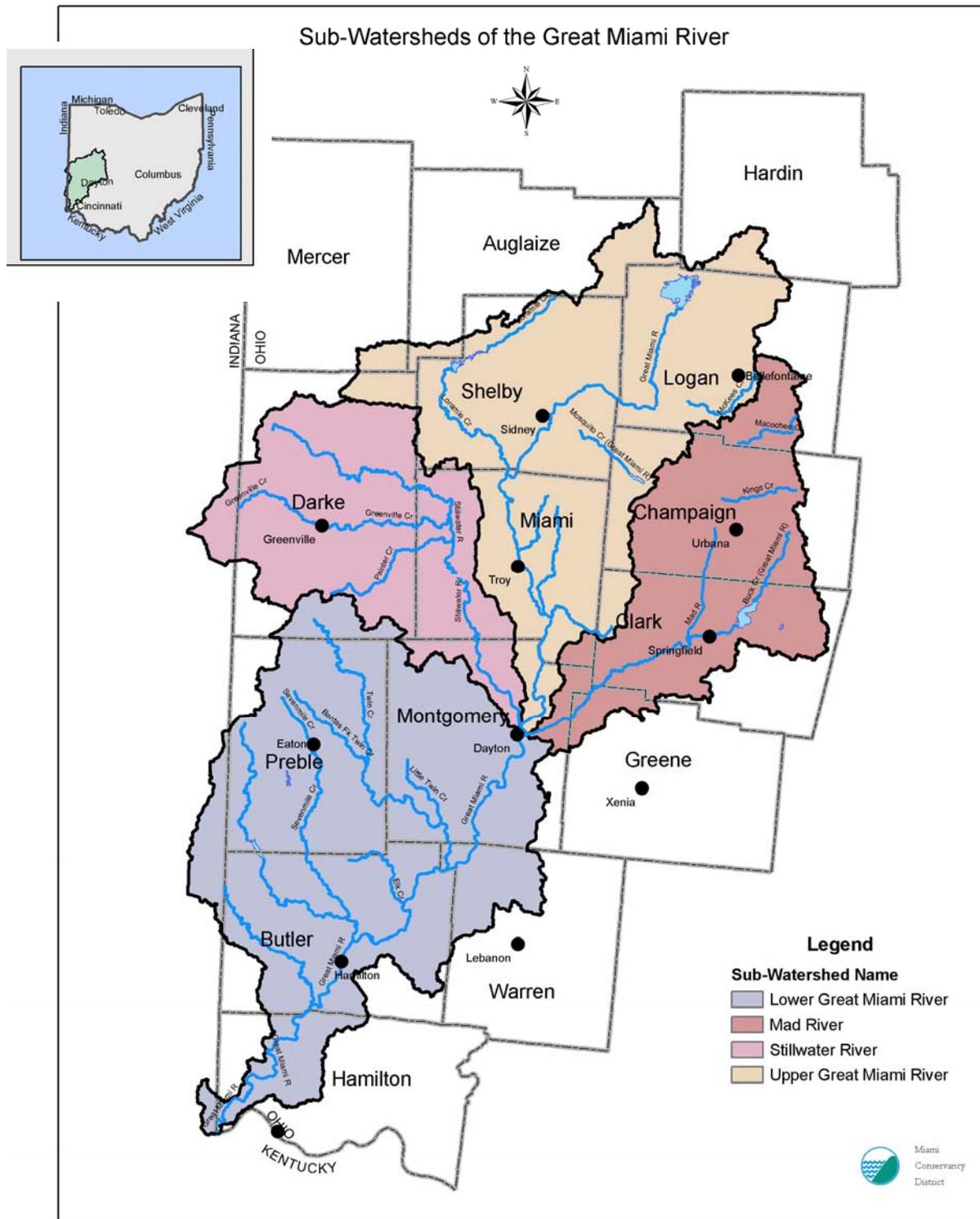
It is possible that weather or some other unpredictable event will cause the failure of a management practice. In an effort to minimize adverse water quality impacts and to minimize Trading Program disruption, a Plan will be developed in collaboration with the Ohio DNR for ensuring that the management practice is restored as quickly as possible.

5.9 Develop Model Agreements Between: WCS + SWCDs, and SWCDs + Producers

Model agreements will be developed that clarify and promote consistent expectations for all Trading Program participants. To the extent possible, agreements between SWCDs and agricultural producers will be similar to agreements currently utilized for the implementation of Farm Bill or other publicly-funded projects.

Appendix A – Maps

Map 1



MIAMI CONSERVANCY WATERSHED INITIATIVE

Upper Great Miami River Watershed

The Upper Great Miami River Watershed ends at the confluence of the Wolf Creek and Great Miami Rivers at Dayton, Ohio and stretches north into ten counties, primarily Shelby, Logan, and Miami. Principal tributary streams include Loramie Creek, Honey Creek, and Spring Creek.

The land use within the Upper Great Miami River Watershed is primarily agricultural, but also includes several urbanized areas including Sidney, Piqua, and Troy.



31 E. Main Street
Piqua, OH 45357
Phone: (937) 224-1271
Fax: (937) 224-4735

Target Habitat(s) for
watershed restoration:
www.miamiconservancy.org

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1000 Main Street, Piqua, OH 45357

Biological health of rivers and streams in the Upper Great Miami River Watershed



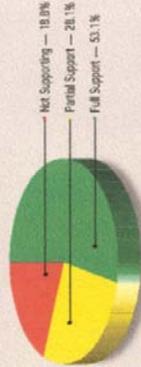
WHO FEEDS THE FISH?

With more than 1,200 species, aquatic insects are the largest group of Ohio stream wildlife. Mayflies are one of the more abundant of these creatures, even though they only live for one day after becoming an adult. The immatures — or nymphs — live in a variety of healthy stream habitats from which they emerge as adults in very large numbers. Both nymphs and emerging adults are important food items for many fish and other wildlife. Mayflies are excellent indicators of good water quality. (Snoodes 2007)



Other facts about the Upper Great Miami River Watershed

HOW HEALTHY IS THE UPPER GREAT MIAMI RIVER WATERSHED?
A 1995 Ohio EPA Biosurvey identified that the water quality in this watershed has greatly improved over the last few decades. This is mainly due to the improvement of treatment for sewage and industrial discharges before they empty into the rivers. This constitutes one of the most extensive and significant recoveries witnessed in the 17 year history of the Ohio EPA biological and water quality monitoring program." (Ohio EPA 1996)



In order to continue this recovery and fully restore water and ecological quality, the progress made with pollution discharges will have to continue. Preserving streamside forests, restoring natural stream channels and where possible, educating citizens are essential steps to ongoing improvement.

HOW IMPORTANT ARE THE LITTLE STREAMS?

Headwater streams are the small swales, creeks and streams that are the origin of most rivers. These small streams join together to form larger streams and rivers or run directly into larger streams and lakes. The quality of water in the larger streams and lakes has a direct connection to the quality of the water coming from their source.

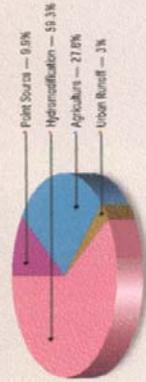


The small streams that drain the larger rivers are important building blocks of the greater watershed.

These headwater streams are often thought of as unimportant and just small ditches for runoff rather than a vital piece of the entire watershed. Preserving and restoring the headwater streams will have a direct effect on the health of all the streams!

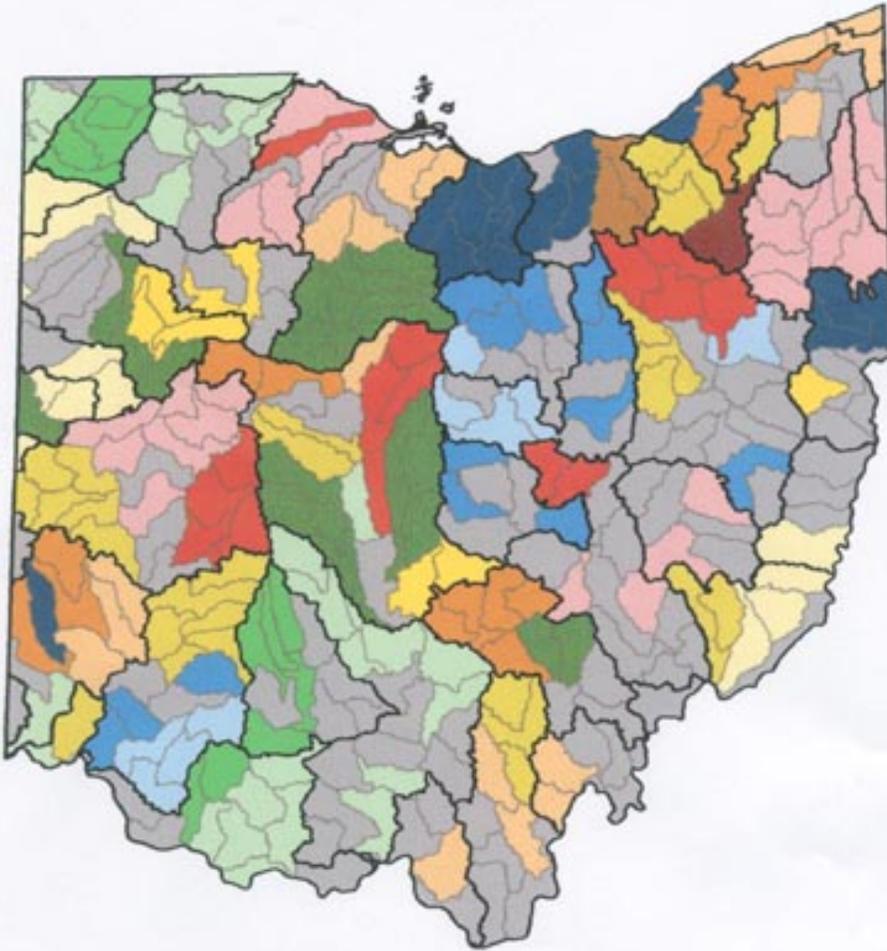
THREATS TO THE UPPER GREAT MIAMI RIVER

Water pollution threatens both public health and aquatic life. The quality of the streams in the Upper Great Miami River Watershed is impacted by four main sources. Point sources of pollution (pollutant sources that are easy to locate and regulate) are responsible for less than 10%. The other impairment sources include polluted runoff from both rural and urban land, development too close to the stream channel, and modifications made to the shape and slope of the streambank and stream channel.



Map 6

Ohio 2002 Integrated Report Ohio Long-Term TMDL Schedule



See Section 7 of 2002 Integrated Report

OhioEPA
Division of Surface Water
BAW 9/27/02

TMDL Schedule		
2000	2005	2010
2001	2006	2011
2002	2007	2012
2003	2008	2013
2004	2009	2014

Appendix B – Ohio EPA Correspondence



State of Ohio Environmental Protection Agency

NOV 21 2003

STREET ADDRESS:

Lazarus Government Center
122 S. Front Street
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184

MAILING ADDRESS:

P.O. Box 1049
Columbus, OH 43216-1049

November 14, 2003

Dusty Hall, Manager
Watershed Initiatives
Miami Conservancy District
38 East Monument Avenue
Dayton, Ohio 45402

Dear Mr. Hall:

You requested clarification on Ohio EPA's and U.S. EPA's positions on two issues related to trading. The first issue requests clarification on allowing trading as a means of complying with technology-based standards and the second addresses meeting standards in all points of a stream involved in a trading scenario.

Please find enclosed a copy of a letter from U.S. EPA Region V to the Wisconsin Department of Natural Resources on the topic of trading. In summary, this letter states that technology-based standards needed to implement certain sections of the Clean Water Act (CWA) have to be achieved without reliance on trading. None of the cited CWA sections however, require municipal wastewater treatment plants (WWTPs) to meet technology-based standards for phosphorus. The U.S. EPA letter goes on to say that permits must also include treatment standards established by States. U.S. EPA defers to the States as to whether the use of trading may be used to meet these state treatment standards.

Ohio EPA requires major WWTPs that are located in the Lake Erie Basin or discharge into nutrient-impaired streams meet the 1 mg/l limit for phosphorus. As we discussed in a recent telephone call, Ohio EPA will accept alternative trading scenarios to eliminate the stream impairment without meeting the 1 mg/l phosphorus discharge limit.

The second issue you raised is the need to meet chemical and biological water quality standards in every point in an impaired stream. We have discussed with U.S. EPA Region V staff the applicability of water quality criteria within a particular water body and whether there is any flexibility to exceed a criterion in the part of a stream between two parties engaged in a trade. The U.S. EPA Trading Policy clearly states that a water quality trade should not eliminate the need to meet applicable criterion for the pollutant being traded. Specifically, Section III Part 2 states that trading schemes should ensure that "standards are maintained throughout the trading areas and contiguous waters" and Part 4 states that "baselines for generating pollution credits should be derived from and consistent with water quality standards." As water quality standards include all applicable narrative and numeric water quality standards, any trading projects are expected to comply with all applicable water quality criteria. We fully subscribe to this position.

Bob Taft, Governor
Jennette Bradley, Lieutenant Governor
Christopher Jones, Director

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Dusty Hall, Manager
November 14, 2003
Page Two

However, depending upon the specifics of a proposal, we may have opportunity for flexibility. Specifically, your proposal for a trading project in the Greater Miami Basin is looking at nutrients and other factors such as habitat. Since nutrient criteria are not yet in place, trades among sources of nutrients may be approached through the setting of a nutrient cap, as described under Section III Part 5 Number 2 of U.S. EPA's Trading Policy for "Pre-TMDL trading in impaired waters." Additionally, monitoring the instream biological condition during trading will assess the condition throughout the watershed so that any adverse responses of the biological communities to the trading program can be corrected.

Ohio EPA intends to adopt U.S. EPA's recommended nutrient criteria for impoundments and reservoirs in 2005 and any trading caps should be based upon achieving these criteria recommendations. Nutrient criteria for streams and rivers are still under development and are not expected to be adopted until 2007. However, once nutrient criteria are adopted by Ohio EPA and approved by U.S. EPA, any trading system will need to ensure that the applicable water quality criteria are achieved throughout the affected watershed or part of a plan to achieve these criteria. If current trades do not lead to attainment of nutrient criteria in the watershed, additional reductions will be necessary.

In the longer term, the nutrient criteria and implementation policies adopted into the state water quality standards may themselves offer some flexibility. Ohio EPA intends to allow the maximum flexibility in drafting the nutrient criteria. This flexibility should help in promoting the use of trading to meet the water quality standards requirement for nutrients.

If you have any questions, please do not hesitate to contact me at (614) 644-2041.

Sincerely,



George Elmaraghy, Assistant Chief
Division of Surface Water

Enclosure

cc: Jim Simpson, Ohio EPA Southwest District Office

Appendix C – Model Draft Language for Inclusion in NPDES Permits

Issued to (Investor-Status) Eligible Buyers
in the
Great Miami River Water Quality Credit Trading Program

The City of Dayton (Permittee) is a voluntary participant in the Great Miami River Watershed Water Quality Credit Trading Program (Trading Program) that is managed through the Water Conservation Subdistrict of The Miami Conservancy District, a political subdivision of the State of Ohio. The Ohio Environmental Protection Agency and the Ohio Department of Natural Resources work in cooperation with the Water Conservation Subdistrict to implement the Trading Program. The Director has reviewed and approved the Operations Manual for the Great Miami River Water Quality Credit Trading Program.

Many stream and river miles within the Great Miami River Watershed currently fail to attain Ohio's water quality standards. Nutrients are frequently cited as a cause for failure to attain the standards. The Permittee is voluntarily participating in the Trading Program prior to new permit limits for nutrient discharges or the completion of Total Maximum Daily Load studies. This voluntary participation generates earlier water quality benefits in the watershed. Furthermore, by beginning the agricultural practices sooner the practices will be more reliable for subsequent use in generating credits for permit compliance.

The Trading Program has financial incentives for the Permittee to voluntarily fund projects prior to new permit limits for nutrient discharges. As provided for in the approved Operations Manual, voluntary early participation in the Program entitles the permittee to favorable water quality credit trading ratios as a Trading Program "Investor". The Director and the Permittee agree that the Investor ratios apply to the same substance(s) in the same amounts as the nutrient reductions voluntarily accomplished by the Permittee. In the event the Great Miami River is deemed by the Director to be impaired at the Permittee's discharge location, trading ratios will be modified pursuant to the Operations Manual.

If at any time the permittee no longer participates in the Trading Program the accrued benefit of the voluntary participation by the permittee will be used to offset the Permittee's current or future regulatory requirements. The specific offset will be determined in consultation with the Permittee and subject to the approval of the Director and may include higher discharge limits, delayed compliance schedules, or other actions deemed appropriate to achieve attainment of water quality standards throughout the Great Miami River Watershed.

Appendix D – An Adaptive Implementation Approach to Estimating Nutrient Reductions

There is a number of state and federally sponsored programs (e.g. Section 319 grant program) that consider the potential nutrients discharge reduction as a factor when awarding grant dollars to a specific management practice. The accurate estimation of a pollution reduction resulting from a management practice is also a critical factor in water quality credit trading. While many variables may impact the ultimate efficiency of a management practice, it is important for the estimated amount of pollutants reduced to be as accurate as possible within known ranges of variability. This project will run concurrently with the Great Miami River Watershed Water Quality Credit Trading Program.

Currently Ohio, Indiana, Illinois, and Michigan utilize similar approaches to estimate management practice efficacy. Ohio's Load Reduction Spreadsheet v1.2 (<http://www.dnr.state.oh.us/soilandwater/downloads.htm>) calculates the nutrient load reductions for a variety of practices (see Table 1). Although this list of management practices is fairly comprehensive, it is not complete. The Great Miami River Watershed's Water Quality Credit Trading Program (Trading Program) offers an opportunity to assess and potentially improve the accuracy and scope of the existing Load Reduction Spreadsheet. Since the Trading Program will require the conduct of water quality testing for a minimum of 5% (with a target of 10%) of all projects included in Trading Program transactions, new data will become available to measure the accuracy of the estimates. In addition, management practices that are not currently included in the Load Reduction Spreadsheet may be proposed to the Trading Program to generate credits. This presents opportunities to expand the scope of the Load Reduction Spreadsheet to address additional practices.

The Ohio EPA and Ohio DNR will establish a Load Reduction Workgroup. The Workgroup will be responsible for the periodic evaluation and enhancement of the Load Reduction Spreadsheet. The Workgroup will receive project specific information on management practices, load reduction estimates, and associated analytical data. The Workgroup will also:

- Direct and oversee the biannual evaluation of the accuracy of estimates made for the Trading Program.
- Provide timely support to soil and water conservation professionals in the course of approving management practices not addressed by the current Spreadsheet.
- Consult with the Ohio EPA, Division of Environmental and Financial Assistance staff regarding practices not addressed by the Spreadsheet that will be funded by Ohio's State Revolving Fund.
- Arrange periodic training in the use of the Load Reduction Spreadsheet for soil and water conservation professionals.

Outcome: An optimized return-on-investment for nutrient management practices and maximized attainment of state water quality standards.

Output: A user-friendly tool that is continuously improved and accurate estimates of the results of management practices designed to reduce the discharge of nutrients to waters of the state.

Table 1. Management Practices included in Ohio's Load Reduction Spreadsheet

Worksheet	Possible Practices
Gully Stabilization	Grade stabilization structure Grassed waterway Critical area planting in areas with gullies Water and sediment control basins
Bank Stabilization	Animal trails and walkways Stream channel stabilization Streambank protection
Agricultural Fields	Prescribed grazing Residue management, mulch till Conservation crop rotation Conservation cover Cover and green manure Critical area planting Stripcropping, contour Stripcropping, field Filter strips
Feedlots	Animal waste systems
Home Sewage Treatment Systems	Septic system pumping or rehabilitation
Stream Restoration	Restoration of natural stream function
Urban Runoff	Vegetated filter strips Grass swales Infiltration devices Extended wet detention Wetland detention Dry detention Settling basin Sand filters WQ inlets Weekly street sweeping Infiltration basin Infiltration trench Porous pavement Concrete grid pavement Sand filter / infiltration basin WQ inlet w/ sand filter Oil / grit separator Wet pond

Appendix E – Official Plan

Plan for Improving the Quality of Surface Water in The Great Miami River Watershed

I. Introduction and Background

This constitutes a change of the Official Plan of the Water Conservation Subdistrict of The Miami Conservancy District pursuant to Ohio Revised Code §6101.39. The change is entitled Plan for Improving the Quality of Surface Water in the Great Miami River Watershed (henceforth “Plan”). This Plan responds to requests from regulated wastewater dischargers and others to provide an expanded scope of surface water quality services in the Great Miami River Watershed. The overall purpose of the Plan is to help area governments and businesses comply with water quality regulations using good science and innovative methods that provide better water for less money.

The strategies included in the Plan provide flexible and cost-effective options to respond to evolving regulations under the Federal Water Pollution Control Act (Clean Water Act). The Plan combines the collection of scientific data with creative strategies that improve surface water quality and address regulatory requirements using the lowest cost options. The Plan offers services that (1) the community has requested and (2) complement The Miami Conservancy District’s existing watershed-based activities. The Miami Conservancy District seeks partnerships whenever possible to avoid duplication of services in attaining the desired outcomes.

The Water Conservation Subdistrict of The Miami Conservancy District was formed in 1953 and has been the keystone of surface water quality research and management for the District. Although the Water Conservation Subdistrict has been dormant in recent years, work previously conducted through the Subdistrict provides an excellent foundation for the current Plan.

II. Statement of the Plan

The Plan provides two key services.

1. Establish and administer an innovative water quality credit trading program.

Water quality credit trading is a market-based approach to maximize the benefits from pollution reduction investments. It provides a mechanism for regulated point source dischargers and municipalities with permitted storm water dischargers to meet pollutant reduction requirements by providing cost effective pollution reduction measures upstream. Tradable upstream measures could include any effort that reduces sources of water quality impairment including reducing pollution, restoring flow, or improving habitat. Establishing management practices in agricultural

production areas is frequently cited as reducing pollution at a much lower cost than the regulated discharger can provide through treatment, infrastructure, or other traditional methods. Studies have indicated potential savings on efforts to improve water quality ranging from 40% to 80%. Water quality trading also provides an opportunity for leveraging federal and state program dollars into additional projects that reduce impairment. The water quality trading program established under the Plan is subject to on-going review and approval by the Director of Ohio EPA, or his/her designee.

Maintaining a market for water quality credit trading requires local involvement. Community-based watershed groups are particularly helpful. These groups include neighbors that share interests and have the knowledge to make informed water quality management decisions. They are “closest” to the pollution sources that need to be addressed and are most likely to be able to achieve community trust and support for water quality enhancement projects that generate marketable credits. The Plan enables The Miami Conservancy District to encourage and support the trading market through activities that: (1) promote on-going Watershed-wide coverage by community-based subwatershed groups, and (2) develop and maintain the capacity of these groups to implement the management practices that generate water quality credits.

Due to the innovative nature of this approach to water quality enhancement, aggressive coordination of partners is required. There are a large number of Federal, State, local, regional, public, and private agencies, and volunteer organizations that impact on the water resource needs identified by the communities in the Watershed. The Plan provides for The Miami Conservancy District to coordinate all of these stakeholders.

2. Collect baseline water quality and management practice performance data.

Because water quality credit trading shifts the emphasis for water quality improvement from pollutant sources that are easily monitored to management practices that are more difficult to monitor, there is a need for increased data collection to ensure the desired outcomes are being attained. Although Ohio EPA is the principal agency responsible for the generation of water quality data for streams and rivers in the Watershed, funding constraints have resulted in severe limitations on water quality data. These data limitations lead to uncertainty about the cost/benefit ratio of various management practices and make it difficult to prioritize investments in nonpoint source management strategies. Furthermore, infrequent data collection may result in unwarranted regulation in areas that have already reached attainment with Ohio’s water quality standards. Pursuant to Ohio Revised Code §6101.15(N), the Plan provides for the Water Conservation Subdistrict to augment Ohio EPA’s watershed-wide baseline sampling. The Plan also provides for project-specific sampling that establishes performance data for a range of urban and rural management practices. These data support the water quality trading program described above.

III. Projected Program Cost

Preliminary budget estimates for Plan implementation range from approximately \$518,000 (without biological monitoring) to \$995,000 (with biological monitoring) per year for the first three years.

IV. Benefits

There are a variety of benefits and beneficiaries that can be ascribed to the Plan. A June 2004 report entitled *Preliminary Economic Analysis of Water Quality Trading Opportunities in the Great Miami River Watershed, Ohio*, by Kieser & Associates estimates the cost savings for wastewater treatment plants to be \$314,000,000 to \$384,700,000 over a twenty year period. Furthermore, nearly every resident of the Watershed may benefit from improved recreational opportunities, increased economic competitiveness, and an overall enhanced quality of life. More specific benefits and beneficiaries are shown in Table 1.

Table 1. Summary Table of Benefits and Beneficiaries

Service	Benefits	Beneficiaries
Water Quality Trading	<ul style="list-style-type: none"> -Cost-effective compliance -Mitigation for impacts of new pollution sources -Effective “penalty projects” -Increased benefit from voluntary nonpoint source controls -Enhanced flood protection -Increased effectiveness and efficiency of efforts -Community supported, voluntary pollution control projects 	<ul style="list-style-type: none"> -Dischargers subject to new regulatory limits -Federal, State, county, and local governments, subwatershed groups and watershed residents -Operators of nonpoint sources of pollution -Agricultural producers -Entities subject to penalty projects -Boating and fishing enthusiasts -The Miami Conservancy District
Data Collection	<ul style="list-style-type: none"> -Determination of conformance with designated uses and water quality standards -Location of pollution sources or lack thereof -Increased strategic focus for water quality improvement efforts -Enhanced ability to attract state and federal grants -Ability to determine benefit cost for management practices 	<ul style="list-style-type: none"> -Ohio and U.S. EPAs -Dischargers subject to new regulatory limits -Federal, State, county, and local governments -Drinking water suppliers -Managers of nonpoint sources of pollution -Subwatershed groups -Storm water permittees and other discharge permit holders

V. Funding

The Plan is funded through voluntary agreements with beneficiaries and/or by other sources. An assessment for a specific geographic area may be proposed to the Board of Directors of The Miami Conservancy District and to the Conservancy Court if such an assessment is requested and supported by the governments and other stakeholders representing the geographic area requesting the assessment. Any such assessment will only be implemented after following the procedures required by Ohio Revised Code §6101.39.

VI. Geographic Boundaries

The Plan does not alter the existing geographic boundaries of the Water Conservation Subdistrict.