

# Water Quality Credit Trading Program

A common sense approach to reducing nutrients



The Great Miami River Watershed, located in southwest Ohio, has experienced marked improvements in surface water quality over the last three decades. Despite these improvements, about 40 percent of the watershed's rivers and streams – primarily in the headwaters areas - still fail to meet water quality standards. Excess nutrients contribute to this failure locally and also to adverse impacts downstream including the Gulf of Mexico. The failure to fully attain water quality standards will trigger additional regulations focused on wastewater treatment plants.

Because more than 70% of the land in the Great Miami River Watershed is used for agriculture, the majority of nutrient-related water quality challenges relate to agricultural land uses. Agricultural producers in the Watershed have worked diligently for years to implement conservation farming practices. However, available federal, state and local incentives to implement these practices do not match the needs.

## **COLLABORATIVE SOLUTION**

MCD collaborated with federal, state, and local partners to design and implement a market-based program that reduces nutrients in streams and rivers as an alternative to traditional regulatory strategies. The success of the program has drawn international attention. Water quality credit trading is an innovative approach to invest dollars in voluntary agricultural practices, which are more cost-effective and provide broader environmental benefits, than technology upgrades at wastewater treatment plants.

As of December 2015, 467 agricultural projects have been contracted generating more than 1.14 million credits over the life of the projects. More than 1.76 million dollars will be paid to agricultural producers for these credits. This translates to a 626 ton reduction in nutrient discharges to rivers and streams and other benefits including more sustainable farming operations and an array of ancillary environmental benefits.

## **ECONOMIC BENEFITS**

An extensive economic and market analysis was completed prior to Trading Program design and concluded that water quality trading in the Watershed has the potential to provide significant cost savings with increased environmental benefit when compared to traditional regulatory approaches. The analysis estimated that wastewater treatment plant upgrades with biological nutrient removal technologies would cost \$422.5 million. The cost for implementation of agricultural conservation practices to achieve a similar level of nutrient reduction was projected at \$37.8 million, a potential \$384.7 million savings compared to wastewater treatment plant upgrades. It was estimated that on average, point sources would pay \$23.37 to reduce one pound of phosphorus with biological nutrient removal compared to \$1.08 for agriculture with conservation practices. For nitrogen, point source unit costs were \$4.72/pound compared to \$0.45/pound for agriculture.

## EVALUATIONS

- Texas A&M University conducted an evaluation of the economics of the pilot that was used to adjust aspects of the Trading Program. Economic performance will be measured by comparison of credit costs to treatment costs.
- Changes to water quality will be measured through a continuous water quality monitoring program at a subwatershed scale. To establish a data collection program, continuous monitoring is collected during the pilot. A water quality report, Nitrogen and Phosphorus Concentrations and Loads in the Great Miami River Watershed, Ohio 2005 – 2011, was published by the Miami Conservancy District in 2012.
- The effectiveness of agricultural practices is verified through field inspections by Soil and Water Conservation District staff.

## PARTNERS

- Miami Conservancy District
- Cities of Dayton, Englewood, and Union
- Butler County Water and Sewer Department
- Tri-Cities North Regional Wastewater Authority
- Great Miami River Watershed Joint Board of county soil and water conservation districts
- Ohio Farm Bureau Federation, Inc.
- Ohio Environmental Protection Agency, Division of Surface Water
- Ohio Department of Natural Resources, Division of Soil and Water Conservation
- U.S. Department of Agriculture, Natural Resources Conservation Service
- U.S. Environmental Protection Agency

## PILOT PROGRAM

The Great Miami River Watershed Water Quality Credit Trading Program (Trading Program) was started in 2004 as a pilot to evaluate the viability of water quality credit trading as an approach to reduce nutrients in the Watershed. The pilot establishes a new sustainable local source of revenue for agricultural producers to implement conservation practices in cooperation with wastewater treatment plants. The program continued in pilot much longer than expected because the anticipated nutrient regulations were delayed more than ten years after originally announced by Ohio EPA.

To fund the pilot, more than \$3 Million in funding came from several sources including wastewater treatment plants, the Ohio Department of Natural Resources, the U.S. Department of Agriculture, and the U.S. Environmental Protection Agency.



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## SUMMARY

- A majority of the Great Miami River mainstem does meet state water quality standards
- Widespread nutrient impairment exists in the Great Miami River Watershed:
  - Many headwater streams do not meet state water quality standards
  - Contributes to problems in Gulf of Mexico
- USEPA issued guidance for water quality credit trading in 2003
- Ohio Administrative Code establishes rules on a voluntary statewide water quality trading program:
  - (1) Facilitates watershed-based approaches to improving water quality;
  - (2) Improves water quality and minimizes the costs of achieving and maintaining water quality standards;
  - (3) Provides economic incentives for voluntary pollutant reductions from point sources and nonpoint sources; and
  - (4) Achieves additional environmental benefits beyond pollutant reductions.
- Ohio EPA draft nutrient criteria mentions Trading as “most cost-effective means to attain standards”
- Trading Program created 2004
  - Collaborative and inclusive partnership
- Potential WWTP upgrades = \$422.5 million
- Trading = \$46.5 million
  - Ag. practices = \$37.8 million
  - Data collection & transaction costs = \$8.7 million
- Citizens and businesses save \$376 million
- Trading achieves better environmental results
  - Reduce nutrient impairment AND other pollutants
  - Improve upstream areas
  - Create habitat
  - Provide cooling effects
  - Enhance streambank stability
  - Decrease flow velocity
  - Create wetlands and protect floodplains
  - Increase assimilative capacity
- 467 projects installed that will prevent 626 tons of nutrients in streams and rivers
- \$1.76 million paid to agriculture producers
- Cost per pound to prevent nutrients in streams and rivers using Trading = \$1.48