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# Missouri Water Quality Trading Framework

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Division of Environmental Quality

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Water Protection Program

# Missouri Water Quality Trading Framework

## TABLE OF CONTENTS

<b>Goals and Use of the Missouri Water Quality Trading Framework</b> .....	1
<b>Common Infrastructure</b> .....	2
Missouri Soil and Water Information Management System (MoSWIMS).....	3
Nutrient Tracking Tool (NTT).....	3
Clearinghouse.....	4
Attenuation Modeling.....	5
<b>Required Elements of a Trading Proposal</b> .....	6
<b>Introductory Information</b> .....	6
<b>Required Elements of a Trading Proposal</b> .....	6
Element #1 - Trading Goals (Water Quality Goal).....	6
Element #2 - Trading Area.....	7
Element #3 - Trading Type.....	7
Element #4 - Species to be Traded.....	7
Element #5 – Monitoring.....	8
Element #6 - Baseline Performance.....	9
<b>Uniform Elements of a Trading Proposal</b> .....	9
Element #7 - Time Terms of Trades.....	9
Element #8 - Trading Margin.....	10
Element #9 - Extreme Events.....	11
<b>Elective Elements that Could Be Addressed through a Clearinghouse</b> .....	11
Element #10 - Liability.....	11
Element # 11 - Tracking.....	12
Element #12 - Enforcement of the Conditions of Individual Trades.....	12
Element #13 - Trading Ratio.....	12
<b>Determination of Credits</b> .....	14
<b>Ecosystem Services</b> .....	14
<b>References</b> .....	15
<b>Definitions</b> .....	15

# Missouri Water Quality Trading Framework

## Goals and the Use of the Missouri Water Quality Trading Framework

This document sets forth the basic policy for water quality trading in Missouri. It defines the major elements that any entity seeking to create a trading program will need to provide to the Department of Natural Resources (the department) in its water quality trading prospectus. The framework is designed to guide any organization through the process of developing a water quality trading program. The framework allows flexibility for implementing these elements in the prospectus in recognition of differences in water quality, basin geography, individual water quality drivers, and local circumstances.

The Water Quality Trading Framework contains:

- A description of common infrastructure available to support trading programs;
- Descriptions of each element and the considerations that should guide decision-making for each element;
- References to key documents; and
- Definitions of the terms used

In response to interest in nutrient trading expressed during the development of the Missouri Nutrient Loss Reduction Strategy, the department established a stakeholder work group in July of 2015 to examine water quality trading. The goal of this group was to provide a framework that serves as the Clean Water Commission and department policy statement on water quality trading in Missouri.

The department and a majority of the stakeholders participating in this work group support the establishment of voluntary water quality trading programs in Missouri. Water quality trading can be an important tool to help meet local and state-wide water quality goals. The framework should also support voluntary trading programs that are effective, efficient, and equitable for all trading partners. The framework is intended to provide the greatest flexibility afforded under federal law and regulations and facilitate proactive water quality improvement actions.

Trading programs function best when adapted to and driven by local water quality conditions and specific water quality goals. Integrating water quality trading into watershed-based management provides participants with a straightforward and economical way to comply with water quality requirements.

Any water quality trading framework must meet the following criteria to be effective. It must:

1. Be both practical and protective of water quality;
2. Create a clear financial benefit for trading that outweighs the risks of trading as part of an overall water quality plan;
3. Minimize and balance risks to those buying and selling credits as well as risks to water quality;
4. Be based on the best science available and adjustable based on advances in understanding of practices, water quality impacts of conservation actions and existing water quality in Missouri's lakes and streams; and

5. Ensure accountability and monitoring to provide the necessary transparency to build confidence in water quality trading.

Water quality trading programs may take many forms in order to properly fit the local water quality goals, hydrology, pollutant(s) of concern, and credit market. This framework supports a broad range of options for trading programs.

Trading may occur:

1. Between individual sources operated by a single permitted entity (although such trades could also be done through permitting without a formal trading proposal);
2. As a bilateral trade between two or more point sources operated by different continuing authorities;
3. Through trades organized and implemented by the local, permitted entity or their agent; or
4. Through trades facilitated by the clearinghouse at the request of and in accordance with the water quality trading prospectus of a local, permitted entity.

The latter two options may include both point source to point source trading and point source to nonpoint source trading.

Nothing in this policy waives requirements of state or federal Clean Water Law. Once a trading prospectus is approved by the Missouri Clean Water Commission, staff of the Operating Permits Section of the Water Protection Program will prepare a state operating permit or permits that include conditions that match those found in the approved prospectus.

### **Common Infrastructure**

Point source to nonpoint source trading requires additional capabilities not needed for point source to point source trading. The department has committed to develop a common infrastructure to support communities wishing to engage both types of trading. The department will make available to trading programs a suite of systems or capabilities that enable the greatest breadth of water quality trading in Missouri in return for payment for the services rendered assuming no other funding source is developed. While no trading program is required to use these systems or capabilities, each provides a set of functions that can reduce the amount of locally-supported infrastructure required for trading, particularly if point source to nonpoint source trading is anticipated.

The decision to support a centralized infrastructure was based on the following:

1. A common infrastructure supports water quality trading by lowering the costs to establish a water quality trading program. It achieves this by reducing administrative costs, particularly for point to nonpoint source trades. Leveraging established systems, such as the Missouri Soil and Water Information Management System (MoSWIMS) and the Nutrient Tracking Tool (NTT), a common infrastructure lowers the cost of operating a trading program. It also frees the point source from having to search for, form and monitor agreements with individual nonpoint sources such as farmers.
2. It reduces risks for point sources that wish to engage in trading with nonpoint sources as the clearinghouse assumes the risks of individual practice failure.

3. It provides a stable market as new credits are created each year through the Soil and Water Conservation Program cost-share program.
4. The clearinghouse will track credits ensuring no discrepancies occur.
5. Because the producer pays for 25% of the practice cost and that fraction is not involved in trading, the department can use a lower trading ratio making water quality trading more economically attractive while ensuring that water quality is improved through the trading program.
6. Because there are no additional requirements beyond those of the state Soil and Water Conservation cost-share program, agricultural producers have no additional requirements that would discourage participation in a trading program.

### **Missouri Soil and Water Information System (MoSWIMS)**

The Missouri Soil and Water Information Management System (MoSWIMS) is a web-based system that automates cost-share procedures for the Missouri Soil and Water Conservation District offices. MoSWIMS is used to allocate funds by resource concern, obligate funds to cost-share contracts, and document payments made. MoSWIMS generates printable cost-share forms and various financial and management reports. Conservation practices can be “built” into MoSWIMS including a selection of components necessary for construction, qualifying criteria (questions that must be answered prior to beginning the contract), contract or per acre maximums, soil loss information, the watershed where the practice is located, etc.

MoSWIMS has the capability to track cost-share fund usage by the districts from the time funds are allocated until cost-share payment is made. MoSWIMS automates cost-share procedures for the 114 county soil and water conservation districts by generating standardized cost-share forms such as contracts, change orders, and contract payments. The contract contains the conditions of the maintenance agreement. It must be signed by the cooperators, technician, and a district board member. The contract payment is also composed of multiple pages and calculates the cost-share payment the cooperators are to receive.

MoSWIMS generates various financial and management reports for use by the Soil and Water Conservation Districts Commission, Soil and Water Conservation Program, and the soil and water conservation district offices. Reporting can be generated statewide, or for individual soil and water conservation districts. Reports can track practices (e.g. Grazing System Water Development), components needed for construction of practices, allocations, status of cost-share funds, and hydrologic unit codes.

MoSWIMS is not available to the public because of computer and data security concerns and access is limited to department and soil and water conservation district staff. Therefore, any trading program that wishes to engage in point source to nonpoint source trading while not using the common infrastructure will need to develop a financial tracking system.

### **Missouri Nutrient Tracking Tool**

The Missouri Nutrient Tracking Tool (NTT) is a web-based field-level conservation practice assessment program (found here: <http://104.239.136.28/NTTG2/Default.aspx>) that uses the Agricultural Policy Environmental eXtender model (APEX) to measure the effectiveness of conservation practices in reducing nutrient and sediment runoff from farm fields. The NTT provides long-term continuous simulations of tillage operations, fertilization, cropping systems,

and conservation practices based on local average weather conditions over the period of record. Outputs include average annual estimates of nutrient and sediment reductions and crop yield changes between baseline and alternative management systems for most federal and state conservation practices. A water quality focus group of state, federal and local stakeholders was formed to provide input during the Missouri NTT development process for use in validating and calibrating the model outputs to soil and weather conditions in Missouri.

Important features of the NTT include:

- Geographic Information System (GIS)-based, that uses site-specific soils, slope and weather data, including automatic selection of soil groups and the closest weather station to the delineated field;
- An improved version of the field-level runoff model, Agricultural Policy Environmental eXtender (APEX). NTT estimations are based on APEX (Williams et al., 2000), which was developed to simulate individual fields and whole farms. APEX has components for routing water, sediment, and nutrients across complex landscapes and channels to the field or farm outlet;
- Default cropping, tillage, and fertilization operations; and
- Options to create custom cropping, tillage and fertilization operations.

The NTT can be used to evaluate the effectiveness of a wide variety of farm conservation practices implemented through federal and state cost-share programs in reducing nitrogen, phosphorus, and sediment runoff from individual farm fields and in documenting the statewide success of these programs. Training and certification of soil and water conservation district technicians in the use of the new version of the NTT is currently being developed by the department's Soil and Water Conservation Program. The United States Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS) is currently developing a national version of the NTT.

### **Water Quality Trading Clearinghouse**

Two department programs (Water Protection Program (WPP) and Soil and Water Conservation Program (SWCP)) and the Environmental Improvement and Energy Resources Authority (EIERA) will coordinate to serve as a mechanism for managing trades for the trading programs using information on agricultural practices gathered through the SWCP. This clearinghouse will collect funds from credit buyers and track trades to ensure that the buyer has sufficient credits to fulfill its regulatory requirements.

The clearinghouse will work in a manner similar to a water quality mitigation bank operating in accordance with Section 404 of the federal Clean Water Act in that it will collect fees and track credits purchased. Once full payment is made to the clearinghouse, the credits purchased are considered fully implemented and cannot be withdrawn, cancelled or otherwise voided.

The process for implementation of a trade through the clearinghouse is illustrated here:

1. An explanation of water quality trading will be supplied to those who sign up for cost share funding through the SWCP. Farmers/producers who participate in the cost-share program will be asked to opt out if they do not want to allow their practices to be used for trading. (The department will have to contact past implementers to determine the availability of their

- credits should a community want to use those credits.) There is no financial commitment or liability for the farmer that is different from signing up for cost-share funding now.
2. A water quality trading prospectus is developed by the potential trading partners with collaboration from the WPP on factors such as attenuation, requirements of the *Missouri Antidegradation Implementation Procedure*, antibacksliding and any hot spot risks within the proposed trading area.
  3. The clearinghouse collects information on practices within the trading area and determines whether sufficient credits are available and the cost of the required credits based on the typical costs of implementing the most cost-effective pollutant reduction practices once the trading ratio has been applied. (Interactive with step 2.)
  4. The cost of the credits is sent to the buyer who then decides whether to buy credits or to implement whatever project is required to meet regulatory requirements. The credits available reflect the pollutant load reduction associated with the roughly 75% of the estimated cost of the practice which is funded through the Parks, Soil and Water Conservation Tax. The credit buyer pays into a fund within the clearinghouse to be managed for the purpose of implementing practices within the trading area designated by the buyer. These funds and the resulting practices will be tracked by the clearinghouse.
  5. When credits are purchased, the funds go into a designated account and the soil and water conservation districts or other nonpoint source projects that include part or all of the trading area are informed that additional funding is available for water quality projects through trading within that area.
  6. Districts can then sign up additional farmers or add practices on farms that are already in the cost-share program and are within the trading area. As these practices are implemented on farms, the same rules apply as in the normal cost-share program, except the practice maximum may not apply. Additionally, other groups may request funding from the clearinghouse to implement other water quality projects within the trading area with the approval of the credit buyer.

Should the number of credits available approach the number needed to fulfill the permit requirements of a permitted point source, the clearinghouse shall inform the permittee and work with the department and the permittee to either implement additional credit-earning activities within the trading area or to adjust the trading area (and associated trading parameters) to ensure compliance with the conditions of the applicants permit.

### **Attenuation modeling**

The department encourages all those entities planning to create a trading program to work with the department to establish an attenuation ratio appropriate for their program. The determination of the attenuation factor is discussed in the trading ratio section, below. The determination of an appropriate attenuation factor must be completed as part of the development of the water quality trading prospectus.

## Required Elements of a Water Quality Trading Prospectus

Each water quality trading prospectus must address all of the elements listed below in the order presented. Each entity proposing a water quality trading program should clearly explain how it plans to accomplish the tasks needed for trading.

Elements #1-6 should be based on local conditions and goals. Elements #7-9 have been defined at a state wide level, but should be noted within the prospectus. Elements #10-13 can be done locally or through the state Water Quality Trading Clearinghouse. If an entity proposing a water quality trading program does not plan to use the clearinghouse, the entity must explain how it will replicate those services and complete its reporting requirements as defined in both the prospectus and its operating permit.

### Introductory Information

1. The owner(s) of the point source(s) and contact address(es) for all point source facilities proposed to be involved in water quality trading;
2. The name of the facilities (credit buyers and sellers) to be included in the trading program, their permit numbers and addresses;
3. The location of the facilities using both a legal description and UTM coordinates;
4. For each facility, the receiving stream, the first classified stream and its Water Body ID (WBID) and the USGS sub-watershed number;
5. The role of any third parties in implementing any aspect of the water quality trading program.

### Elective Elements of a Trading Proposal

#### *Element #1 - Water Quality Goal*

The trading program must have a clearly defined water quality goal that serves as the reason for the establishment of the program. This goal should be tied to the compliance with Water Quality-Based Effluent Limits (WQBELs) or other water quality goals, including goals or treatment targets contained in the Nutrient Loss Reduction Strategy. The goals statement must include details such as the location and causes of any impairment to water bodies within the area, location of point sources to be involved in trading and how the proposed trading program goals fit with watershed goals if these have been defined through Our Missouri Waters, a watershed-based plan or other methods.

The following considerations may help define the water quality goal:

1. Any water quality impairments, their extent and the location of sources of pollution to the watershed upstream of and within the impaired water body;
2. The pollutants responsible for the impairment;
3. Existing and future permit requirements on point sources within the watershed;
4. The locations and discharges of other point sources within the watershed;
5. The location of any specially designated water bodies, including Metropolitan No-Discharge Streams and Outstanding State and National Resource Waters, and how those designations will be addressed within the trading program;
6. How the program will address water quality standards in the trading area (watershed), which must include adherence to the *Missouri Antidegradation Implementation Procedure*.



***Element #2 - Trading Area***

Each proposed water quality trading program must define the area for trades and should be based on a watershed basis. The trading area defines where trades may occur and must include the discharge point of any point sources to be involved in trading. The area must be justified in terms of water quality goals for the pollutants to be traded.

Larger areas promote the greatest opportunity for trades, but applicants may need to address a broader range and higher number of concerns regarding the potential for local water quality degradation associated with larger trading areas. In addition, larger areas may result in higher trading ratios for those pollutants that are attenuated in aquatic systems.

The following details must be addressed in defining the trading area:

1. The justification of the trading area selected in terms of water quality goals;
2. The location of the point source(s) within the trading area and the likelihood that overall water quality offsets will occur within and downstream of the trading area as a result of the proposed trading program;
3. Local factors, including water quality impairments, Total Maximum Daily Loads (TMDLs) and other Clean Water Act or permit requirements related to the pollutant species being traded;
4. Clear delineation of the water quality risks of the proposed trading program and steps to minimize and mitigate those risks;
5. Synchronization of permits within the trading area for point source to point source trades;
6. The regulatory driver(s) for the trading program;
7. The defined point source to point source trading area need not correspond to that for point source to nonpoint source trades, but any differences need to be justified in the proposal;
8. The equivalency of water quality trading impacts and credits across any state boundaries must be clearly determined and agreed to by the states involved prior to the approval of the trading program. Formal agreements between the State of Missouri or the Missouri Clean Water Commission and the other state involved in interstate water quality trading may be required before approval of a program proposing to accept interstate trades.

***Element #3 - Trading Types***

Two types of water quality trades may generally occur: Trades between two or more point sources and trades between a point source and nonpoint sources.

The Missouri Water Quality Trading Framework allows either type of trade to occur and allows both to occur within a single water quality trading program. Each trading program must define which trades will be considered.

***Element #4 – Pollutant Species for Trading***

Water quality trading can be done for a number of pollutants. EPA, in its 2003 trading policy, noted the significant potential for trading in nitrogen, phosphorus and sediments, but also allowed trading of other pollutants upon request and review. While some persistent bioaccumulative toxic pollutants are not eligible for trading because of acute toxicity or other reasons, most common pollutants can be traded under the Clean Water Act. The Missouri Framework will allow trading of any pollutants allowed by the federal Clean Water Act if

estimates of attenuation can be determined for that species; however, permission to trade other pollutants should be sought before submitting a prospectus to allow discussions with EPA.

Generally, Missouri will use loadings of pollutant species as the basis for trading. Loadings of pollutants will be averaged over one year to reflect the seasonal nature of contributions from some sources and to match permit compliance timeframes as well as to address the cumulative and seasonal water quality impacts of the pollutants addressed. Any variation from annual loadings will have to be justified in the water quality trading prospectus.

The following characteristics of species must be considered in establishing the species to be traded:

1. The exact pollutant species to be traded and the units of measure for each;
2. The averaging period, if other than annual, must be clearly justified by the water quality goals for the trading program;
3. The process for determining the equivalence between different forms of a given pollutant. For example, various forms of nitrogen may be present within a watershed, but one form (total nitrogen, total Kjeldahl nitrogen, nitrogen measured as nitrate, etc.) must be selected for trading and measurement.
4. Cross-pollutant trading will need a strong justification and a clear, scientifically valid explanation of how the species interact in the watershed, how conversions between the loadings of the two pollutants will be determined, and whether any of these factors varies with location within the trading area.
5. For species without accepted attenuation factors, the factors to be applied should be based on the best available information and agreed upon in consultation with the Water Protection Program prior to the submission of a trading prospectus.

### ***Element #5 - Monitoring***

Water quality monitoring will be required to the extent that it is necessary to show that trading is not adversely affecting water quality within the trading area. A Sampling and Analysis Plan must be included in the water quality trading prospectus for approval, if instream monitoring is determined to be necessary based on considerations included below.

Monitoring requirements will include point source monitoring as a condition in the permit to measure the point source loadings of pollutants involved in trading. In addition, monitoring may be required at critical locations within the trading area, including instream segments that are currently impaired or that could experience degraded water quality as a result of trading (potential hot spots). In the *Water quality Assessment Procedures* section of the *Missouri Antidegradation Implementation Procedure* it details that the development of baseline water quality, or existing water quality, is a “yardstick for which the degradation is measured for all future antidegradation reviews in a segment” of a waterbody.

Modeling is expected to be used for those agricultural practices through the Nutrient Tracking Tool or its equivalent where such models have been validated to provide consistency in the valuation of individual practices and groups of practices. However, new practices may require monitoring to provide a good measure of their value in the context of water quality trading.

Potential considerations with respect to monitoring include the following:

- Locations of, and loadings of the traded or related pollutants from point sources;
- Implementation of monitoring of projects;
- Data quality assurance;
- Monitoring of potential sites of higher loading (i.e., hot spots) and/or higher water quality risk to ensure that all components of the Missouri Water Quality Standards are protected;
- Justification for the use of modeling vs. monitoring for non-agricultural practices or those practices not included in the tool (NTT or other) being used to quantify the water quality benefits of agricultural or other nonpoint source practices;
- SAPs must be submitted to and approved by the department prior to the implementation of any required monitoring program. Example SAPs are available from the WPP by request.

### ***Element #6 - Baseline Performance Standards***

The baseline performance expectations for a point source are the permit conditions, where present, or long-term average effluent quality without pollutant removal in the absence of a permit condition. If a facility installs pollutant removal before it is a regulatory requirement, it can accrue credits for trading consistent with timelines established in Element #7 of this framework. Performance will be determined by effluent monitoring for point sources and through modeling or, where appropriate if modeling does not exist, monitoring for non-point sources

For agricultural lands, the current condition sets the baseline as these properties are not currently regulated nor has any minimum standard been set for such lands. Individual trading programs may consider the requirement that a nutrient management plan be in place on the farm where the best management practice (BMP) or other credit-earning activity will take place. Trading programs may also consider a gradual increase in baseline to increase performance expectations in the watershed.

The nonpoint source baseline for those watersheds for which a TMDL has been completed will be derived from the TMDL. Because the trading area may not correspond directly to the TMDL water body, those proposing a water quality trading program should consult with the Watershed Protection Program.

## **Uniform Elements of a Trading Proposal**

### ***Element #7 - Time Term of Trades***

The time term of trade refers to the length of time that a specific water quality credit is available for trading. This depends on the period during which the practice or project improves water quality. It begins when a practice or project is implemented and the water quality benefit is achieved and continues until that benefit no longer exists or is no longer documentable. For some agricultural practices, the practice needs to be implemented anew each year, while other agricultural practices and most point source infrastructure projects have extended lifetimes. Projects with a longer maintenance life will provide credits for multiple years.

A water quality credit must be earned before it can be traded or sold. A credit has a total of one year to be traded or sold from the date the credit is earned by the entity. Once the credit is

purchased or traded, the buyer can use the credit within the year it is received or claim the credit for use the following year. This allows buyers to reduce the risk of practice failure by having credits already earned and authenticated to apply against the failure of a specific practice at a specific site. For example, a buyer could purchase 110 percent of the credits needed in year one and 100 percent in subsequent years, providing protection against a 10 percent failure rate in any one year. In addition, a prospectus may describe a longer-term scenario where credits would be managed to meet a water quality goal, in which credits may be reserved for longer terms, particularly for proactive actions that provide substantial water quality benefits and/or load reductions.

Trading programs may create a portfolio of implemented practices and projects that earn credits. These practices and projects can have a mix of shorter and longer time terms as a way to mitigate the risk of project failure and changes in credit costs. The amount of credit earned by a given practice or project may change as more is learned about its water quality benefits. Changes in crediting for practices that provide a multi-year benefit to water quality will occur at the time of permit renewal for each point source.

The time terms for specific projects or practices will be included in the trading program ledger. In defining the time terms of trades, it may be necessary to address the following considerations:

1. Aligning time terms with permit timeframes for those projects or practices with long time terms;
2. Effective time frames as well as the required maintenance periods for the agricultural nonpoint practices and any point source projects involved in trades;
3. Method for the renewal of practices, especially those with short time terms;
4. Each trading program can create a changeable portfolio of projects and practices that matches its needs and the availability of projects that can earn water quality credits.
5. Note that some practices (i.e. forested buffers) take years to achieve their peak water quality benefit and may not earn full credit in the years immediately following implementation.

### ***Element #8 - Trading Margin***

The point source trading margin represents the loading a point source must purchase (trading ratios notwithstanding) to be in compliance with an effluent limit or goal. The trading margin is the difference between existing discharge level (the upper end of the margin) and the treatment requirements that would apply in the absence of trading (the lower end of the margin). Missouri does not apply upper ends for trading margin. Baseline requirements described in Element #6 define the lower end of the margin in the absence of an existing permit requirement.

The following considerations were offered with regard to the trading margin to be used:

- EPA guidance on this topic as presented in the 2003 EPA Water Quality Trading Policy and in the Willamette report (2015);
- The margin may vary with species to be traded; depending on permit limits or other local water quality conditions. It must be defined for each species to be traded.

***Element #9 - Extreme Events***

Many extreme events are defined within permit conditions. In those situations, the permit condition may be applied to the trading program as well. Alternatively, a trading program can use a federal declaration for determining whether an extreme event has caused the failure of projects or practices involved in trading.

For point source to point source trades, the two point source operating authorities must propose a method for addressing extreme weather events and implement that method through legal agreement or permit conditions agreed up on by the department.

For those trading programs using the clearinghouse, the inclusion of known practice failure rates in the trading ratio provides coverage for practices that are negatively impacted by extreme weather events.

For any nonpoint source practices purchased outside the clearinghouse, the permitted authority must propose a method for addressing extreme weather impacts on the nonpoint source practices in order to have proper terms and conditions written into its permit.

The following considerations were offered with regard to extreme events:

- Extreme events are defined in many permits for rainfall events, and those definitions apply to a permitted facility engaged in trading, but not so for other potential events;
- There is a temporal component to these events and their definitions;
- The recovery time from an extreme event and how the reduced effectiveness of practices during that period impacts the credits available for trading;
- The applicant must provide a method for reporting and accounting for these events and their impacts, if implementing trading outside the clearinghouse.

**Elective Elements that Could Be Addressed through a Clearinghouse*****Element #10 - Liability***

The terms of a water quality trading program will be reflected in the permits of those entities buying credits as part of a plan to improve water quality. The permittee thus assumes some liability within a trading program that arises from the permittee's reliance on the actions of third parties to perform the proposed practices or projects and to maintain those practices, as necessary, to create the water quality benefits projected to accrue as a result of those practices.

The permittee must always have sufficient credits to meet its permit responsibilities. This is best ensured by the purchase of reserve (or insurance) credits that can be used to offset the failure of a practice or project within the trading program. The water quality trading proposal should address the risk of project failure and the program's method of addressing this risk.

In the case that a permittee uses the clearinghouse established by the department, the department will have proven that the credits have been earned prior to being added to the list of available credits, thus reducing the complexity of managing nonpoint source credits.

A permittee/credit buyer not using the clearinghouse can choose to use any legal or financial instrument that is agreeable to both parties and approved by the department to clarify responsibilities as a way to address the assignment of liability.

### ***Element #11 – Tracking of Credits***

It is the responsibility of each permitted facility involved in water quality trading to maintain sufficient credits to meet its permit obligations at all times. These credits must be tracked clearly through a ledger that is open for review.

The department, through the Water Protection Program, has the authority to enforce this requirement through permit conditions and has the ability to audit the ledger to assure compliance. The department does not have the authority to enforce conditions on nonpoint source activities, but can review these activities to ensure that the practices included in the ledger are in place and properly maintained.

For those water quality trading programs that use the clearinghouse, tracking will be done through the clearinghouse. However, this does not absolve the permitted facility from maintaining sufficient credits to meet its permit obligations at all times.

### ***Element #12 – Enforcement of Conditions of Individual Trades***

Point source to point source trades must be accompanied by a binding agreement between the parties that address the terms for trading and the contractual and operational expectations of each party.

For the entities that use the clearinghouse for point source to nonpoint source trades, the conditions for the agricultural producer are those found in their cost share contract. The point source has no role in enforcement as any failure to complete the contract which is handled through the Missouri Soil and Water District Commission's procedures.

For those point sources that wish to trade with any nonpoint source while not using the clearinghouse, the permitted entity assumes responsibility for having enough credits in place at all times. If a contract violation or practice failure leads to the permittee having insufficient credits, the permittee is in violation of the terms of its permit and can face penalties under the federal Clean Water Act and Missouri Clean Water Law (Sections 644.006 – 644.141 RSMo). For trades occurring outside the clearinghouse, the permitted entity must provide a method of verifying agricultural or other nonpoint source practices and maintenance of those practices as part of its trading proposal.

### ***Element #13 - Trading Ratios***

Trading ratios reflect a combination of factors, including pollutant attenuation, pollutant equivalency, and various forms of uncertainty.

The delivery ratio factor accounts for attenuation (the in-stream chemical and biological reactions of some species of pollutants), when applicable, and depends on the stream size and structure within the trading area. The second factor reflects the risk of practice failure and extreme events that compromise practice effectiveness. A third factor will address the

uncertainties in practice effectiveness, pollutant attenuation and estimates of failure rates. Finally, an equivalency ratio will be determined for those trades that involve different chemical forms of the same pollutant. For example, total phosphorus discharged from wastewater treatment plants is mostly in dissolved form, such as orthophosphate, while that eroded from farm fields is mostly bound to sediment. Those proposing a trading program are encouraged to work with the department early in the process to determine appropriate factors to be applied in determining trading ratios.

These factors can be combined into a single ratio for the entire program or be calculated on a trade-by-trade basis. In the former situation, the trading area will be assessed and a trading ratio assigned to the trading program with the same ratio used throughout the trading area. Alternatively, a trading ratio can be calculated for each trade based on the relative locations of the sites, the structure of the streams between them and where a regulatory driver applies. The former is simpler and less expensive to implement, while the latter is more precise in its calculations and may reduce credits required by allowing the sites and practices chosen to be optimized, but will cost more to implement.

The general formula for calculating the trading ratio is: Delivery Ratio (where appropriate) times Practice Failure Ratio times Uncertainty Ratio times Equivalency Ratio, (where appropriate).

## **Determination of Credits**

The department has the authority to determine the number of water quality trading credits for any project or practice. Credits for point source projects will be determined using the best available data from similar systems currently in operation. Credits for agricultural nonpoint source practices generally will be determined using NTT, but NTT may be supplemented by additional information where appropriate.

Additional assessments of the water quality benefits of many practices are currently underway and changes can be expected in the number of credits earned by a specific practice. In addition, the water quality benefits of additional practices will be added to NTT when possible as these benefits are documented. The water quality value of practices used in each water quality trading program will change at the time of state operating permit renewal for a point source facility engaged in trading. This means that the same practice may have a different value for a short time in different trading areas, but provides a more predictable trading market.

## **Accounting for Ecosystem Services**

Many projects that could be involved in water quality trading also produce other ecological benefits. For example, a forested stream buffer could also qualify for carbon credits within such a market.

Nothing in this framework prevents projects involved in trading from earning credits under other programs, except that no project may claim credits within two different parts of the Clean Water Act. For example, a project could not be awarded water quality credits for a project under Section 404 for stream or wetland mitigation and also be awarded the water quality credits within a trading program. Should an entity want to assign the ecological value of a mitigation project for the purposes of Section 404 of the Clean Water Act and the water quality benefits to a water quality trading program, the clear distinction between those two sets of credits would have to be submitted to and approved by both the department and the designated U.S. Army Corps of Engineers office before use.



## References

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U.S. Environmental Protection Agency, Water Quality Trading Policy, 68 Fed. Reg. 1608, (Jan. 13, 2003) (final policy), available at: <http://www.gpo.gov/fdsys/pkg/FR-2003-01-13/pdf/03-620.pdf>.

## Definitions

**Adaptive Management** – A systematic approach used in natural resource management to improve an ecological system in response to additional information by incorporating new knowledge into decision-making processes. As applied to Water Quality Trading, this means changing the framework and its implementation as more is learned about trading, operating trading programs, water quality conditions and the efficacy of different agricultural best management practices.

**Annual Practice** – A best management practice that provides a water quality benefit during the year it is implemented, but does not have a provable, longer term impact on water quality. Such practices require action beyond mere maintenance to provide water quality benefits on a continuing basis.

**Attenuation** – A decrease in the quantity of a pollutant as it moves downstream as a result of physical, chemical and biological interactions within a stream or lake. Because trading is based on loading of a pollutant rather than concentrations of that pollutant, dilution is not applied to trading programs.

**Baseline** – The expected minimum level of performance with regard to pollution discharge. Only reductions of a pollutant beyond this level are eligible to be traded. For example, a point source's baseline will be its permit limit or long-term average effluent quality without pollutant removal in the absence of a limit.

**Best Management Practice (BMP)** – A structural or non-structural action that reduces pollutant discharge. For agricultural nonpoint sources, BMPs are vetted by the USDA's Natural Resources Conservation Service and the Missouri Soil and Water Conservation Program. The eligibility and water quality trading value of any proposed non-agricultural practices will be determined by the Water Protection Program.

Credits – The measured or estimated unit of pollutant reduction resulting from a project or practice. This is the unit of exchange in water quality trading and is generally expressed in annual reduction in a pollutant load per year at a specified point.

Bi-lateral trades – Trading involving two point sources in which one facility improves water quality beyond its permit requirements and sells credit for that extra improvement to another facility.

Common Infrastructure – Standardized capabilities run by the Department of Natural Resources and its partners that support trading. The department uses the Missouri Soil and Water Information Management System (MoSWIMS) to track agricultural practices, the Nutrient Tracking Tool (NTT) to model the reductions in soil, nitrogen and phosphorus loss tied to individual practices and groups of practices. In addition, the Environmental Improvement and Energy Resources Authority (EIERA) will operate a standardized ledger that contains all of the practices eligible for purchase by location. The Water Protection Program will work with applicants to determine the proper attenuation values based on the trading area and the stream structure within that trading area.

Ecosystem Services – Positive direct or indirect benefits to humans from natural resources including drinking water protection, wildlife support, and recreation.

Environmental Improvement and Energy Resources Authority – A quasi-governmental agency that helps finance pollution control projects, issues tax-exempt bonds, provides technical assistance on the use of recycled materials and conducts research on environmental issues.

Hot Spot – An increased concentration of a pollutant that causes a localized violation of water quality standards. While trading may increase the concentration of a pollutant at some points within a watershed, a trading program must not allow a hotspot to occur. This can be accomplished by careful selection of project and practice locations.

Hydrologic Unit Code (HUC) – A hierarchical system, created by the US Geological Survey, which defines watersheds using a numerical code. A larger number of digits in the code indicates a smaller watershed. For example, the Gasconade River is an 8-digit HUC (10290203) that contains roughly 30 smaller HUC-12 watersheds. The department does watershed planning at the HUC-8 level. There are 66 HUC-8 watersheds partially or entirely contained within Missouri.

Ledger (or registry) – The record of actions taken and credits awarded within a trading program. It provides a transparent method of tracking credits and determining whether a trading program is meeting its regulatory requirements. Certain elements of the ledger (information on specific practices from individual private landowners) may not be considered public in accordance with state law.

Life Cycle of Credits – The length of time after a practice has been implemented during which the credits it earns can be traded.

Missouri Soil and Water Information Management System (MoSWIMS) – A computerized system that tracks financial information about practices implemented using cost share through the department’s Soil and Water Conservation Program. The system allows data entry from the soil and water conservation district employees as well as SWCP staff.

Nonpoint Source – Pollutants originating from a dispersed land area, not from a specific point, which often are carried by surface run-off. Nonpoint source pollutants are not generally regulated by the federal Clean Water Act, but are addressed through incentive-based methods of reduction.

Nutrient Tracking Tool – A validated, computerized system for estimating pollutant reductions that will result from a single practice or set of practices on agricultural lands. NTT can be operated by soil and water conservation district employees and SWCP staff who have been trained in its use.

Permit Condition – Enforceable component of a permit that allows water quality trading by the permitted entity while defining requirements to be met for trading.

Point Source – A single, defined location from which a water pollutant or pollutants may be discharged. Under the federal Clean Water Act, pollutants from point sources are regulated.

Point Source to Point Source Trading – One point source makes improvements beyond those required by its permit in order to allow another point source to achieve a lesser level of water quality performance than would otherwise be required. The owner of the first point source is compensated for this higher performance by the latter point source owner.

Point Source to Nonpoint Source Trading – A point source pays nonpoint sources in its watershed to implement projects or practices that improve water quality in lieu of implementing a project or projects at the point source.

Practice/Project – An effort to improve water quality through a specific action or set of actions. Practice, in general, refers to an action in agriculture, such as a BMP, while project tends to refer to actions at point sources or in urban areas. The terms are used interchangeably in this document.

Prospectus – The formal application that details the critical elements of a proposed trading program to establish a water quality trading program. This is submitted to the Missouri Clean Water Commission for approval.

Soil and Water Conservation Program (SWCP) – A program within the Department of Natural Resources that works with soil and water districts and agricultural producers to reduce soil erosion and improve water quality through the implementation of best management practices.

Traded Pollutant – The chemical to be involved in trading. If a multiple forms of that chemical are found in water, the trading program may need to explain how it intends to mathematically convert other forms of that chemical into the specie to be traded.

Total Maximum Daily Loads (TMDL) – A calculation of the maximum amount of a pollutant that a body of water can receive and still meet all applicable water quality standards including an allocation of pollutant loadings to point sources and nonpoint sources within a watershed.

Trading Area – A geographic area within which credits can be bought and sold. It contains all of the projects and practices as well as the point source buying water quality credits. Trading areas are defined by the trading program, based on watersheds and the specific goals of each trading program.

Trading Framework – The state-level outline of policy that defines the expected elements to be included in any water quality trading program in Missouri.

Point Source Trading Margin – The loading a point source must purchase to be in compliance with an effluent limit or goal.

Trading Program – A watershed-based effort in which regulatory requirements and water quality goals are met by reducing pollutant loads at one or more locations in exchange for lesser reductions at a permitted facility or group of permitted facilities.

Trading Ratio – The numeric value used to adjust pollutant reductions that accounts for differences in sources, seasonal pollutant loss, relative locations within a watershed, attenuation, water quality risk and other factors that affect the fate and transport of the pollutant traded.

Water Protection Program – The program within the Department of Natural Resources overseeing water quality efforts in Missouri. Its Water Quality Assessment, Permitting and Engineering Sections have roles in water quality trading.

Water Quality-Based Effluent Limits – Permit conditions that are based on local water quality conditions rather than a technology.

Water Quality Trading – An agreement between two or more parties in which one completes a practice or project that will improve water quality in exchange for payment from a party which will use credit for the water quality improvement resulting from that project or practice to meet its regulatory requirements.

Watershed – The area of land that drains to a single point on a river or stream. Each trading program must define the watershed(s) or parts of a watershed that will serve as its trading area.

Watershed Plan – A coordinated effort to describe water quality conditions and to address the water quality concerns in a watershed. Missouri uses the 66 Hydrologic Unit Code HUC-8 watersheds as the basis for its watershed planning (Our Missouri Waters) efforts.