

A Framework for Water Quality Trading in the Western Lake Erie Basin

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A. Introduction and Overview of the Framework

This Framework is the result of a collaborative effort to develop a market-based incentive program to increase adoption of agricultural conservation practices and reduce phosphorus loads to the Western Lake Erie Basin (WLEB)¹. Subject to load reduction targets through both a state and provincial Collaborative Agreement² and the federal Annex 4 process under the Great Lakes Water Quality Agreement³, the WLEB has exhibited troubling signs of nutrient pollution for many years.

The principles for water quality trading (WQT) set forth in this Framework have been developed by representatives of the WLEB jurisdictions of Indiana, Michigan, Ohio, and Ontario⁴, with input from a diverse group of stakeholders. While the Framework was constructed to support WQT as a compliance option for point source (PS) dischargers to acquire total phosphorus (TP) credits, it is also a valuable tool for the stewardship community interested in trading as a vehicle for working with the agricultural community to improve Lake Erie's water quality.

Framework principles reflect a uniform approach to WQT within the WLEB.

1. Scope and Purpose

The United States Environmental Protection Agency (US-EPA) encourages WQT as a cost-effective option for meeting water quality-based effluent limitations in National Pollutant Discharge Elimination System (NPDES) permits.^{5 6} This Framework focuses on phosphorus reduction credit trading between PS credit buyers and agricultural nonpoint source (NPS) credit generators; however, Framework concepts are transferrable to other trading partners.

Agricultural conservation activities that generate phosphorus credits often result in additional ecological benefits. These benefits include improved soil health and

¹ This Framework was developed based upon work led by the Great Lakes Commission with financial support from the Natural Resources Conservation Service, U.S. Department of Agriculture; agreement number 69-3A75-16-035. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Agriculture.

² Western Basin of Lake Erie Collaborative Agreement. Signed by Governor Snyder (Michigan), Premier Wynne (Ontario), and Lieutenant Governor Mary Taylor (Ohio) on June 13, 2015.

³ Binational targets for phosphorus reduction in the WLEB are available at <https://binational.net/2016/02/22/finalptargets-ciblesfinalesdep/> (accessed February 27, 2017).

⁴ Ontario is an observer in this process and considers water quality trading to be one of many potential tools to address excess nutrients in Lake Erie. Ontario is committed to working binationally and domestically with partners to reduce nutrients in Lake Erie through the Great Lakes Water Quality Agreement (GLWQA); Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, 2014 (COA); Ontario's Great Lakes Protection Act, 2015; Western Basin of Lake Erie Collaborative Agreement; and Great Lakes Commission's Joint Action Plan for Lake Erie.

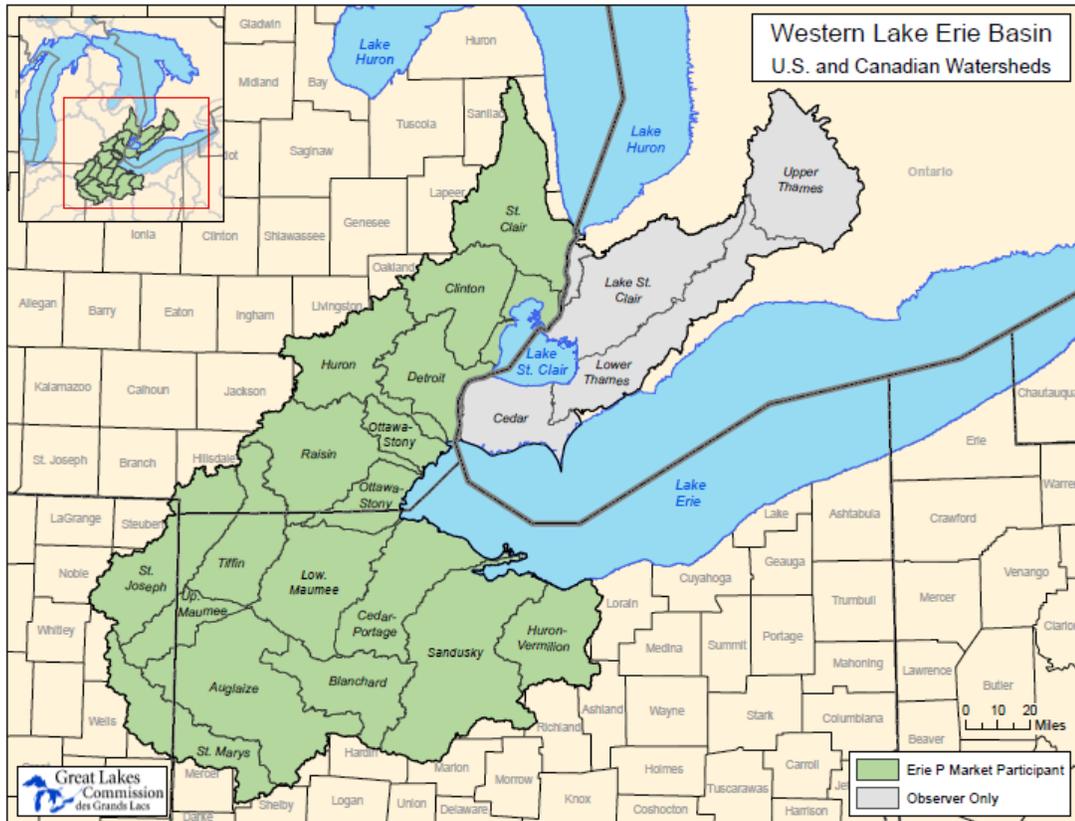
⁵ U.S. Environmental Protection Agency, Water Quality Trading Policy, 68 Fed. Reg. 1608 (January 13, 2003) (final policy), available at <https://www.gpo.gov/fdsys/pkg/FR-2003-01-13/pdf/03-620.pdf>.

⁶ In Ontario, wastewater discharges are regulated under section 53 of the Ontario Water Resources Act R.S.O. 1990 Chapter O.40, under which authorizes the issuance of Environmental Compliance Approvals (ECAs) for waste water treatment discharges and those discharges from storm water facilities that require authorization.

carbon sequestration, flood control, and improved habitat for wildlife, including pollinator species. These ancillary benefits are not quantified within this Framework, although future modifications could accommodate and quantify these additional ecological benefits. In addition, as WQT opportunities within the WLEB grow and mature, trading may be expanded to include credits for other pollutant reductions that may be of interest to water quality managers including (but not limited to) Total Nitrogen and Sediment.

This Framework provides the WLEB jurisdictions of Indiana, Michigan, and Ohio with a consistent method for quantifying phosphorus load reductions from agricultural NPS practices and a series of checks and balances to assure that credit-generating practices are certified and that nutrient reductions are verified and tracked.⁷ These elements of the Framework contribute toward the ultimate goal: reduced phosphorus loads to the WLEB. This watershed-wide approach maximizes returns on investment in a transparent, standardized, and verifiable manner.

This Framework is applicable within the U.S. portion of the WLEB, as defined within Figure 1, below. The acceptance of WQT as a compliance alternative for PSs within this boundary is subject to individual jurisdictions' regulatory process and approval.



⁷ Any protocols used in Ontario (e.g. trade ratios, quantification tools, and practices) would be developed, verified and adopted through Ontario's legislative process with the Ontario Water Resources Act (OWRA), S. 75 (1.7)-(1.9). These sections of the OWRA were proclaimed during the development of this Framework and have an effective date of July 1, 2017. The proclamation sets out specific requirements before WQT can be applied in areas of Ontario.

Figure 1- WLEB Watersheds Considered for Water Quality Trading Under This Framework

2. Legal Basis for Trading

In addition to U.S. federal policy (i.e., USEPA's 2003 WQT Policy), there have been WQT initiatives in Ohio, Michigan, and Indiana and the province of Ontario at one time or another. Of these jurisdictions, only Ohio has administrative rules governing WQT.⁸ This Framework aligns with Ohio's rules, while also incorporating feedback from the other WLEB jurisdictions, and may be adapted for submittal as a Water Quality Trading Plan required by Ohio's administrative rules. Since the initial development of this Framework, Ontario now has enabling authority that requires the development of a regulation to support a trading program in areas within the province.⁹

3. Measures of Success: Program Evaluation

This Framework was initially tested through pilot trades, with both the process and outcomes evaluated by a Trading Advisory Group (Appendix A_TAG Roster) and adapted accordingly.

This Framework encourages thoughtful incorporation of the dense network of existing phosphorus monitoring in the WLEB; however, it is acknowledged that ambient water quality monitoring may not adequately reflect improvements arising from credit generation. Edge-of-field monitoring is preferred, though generally too costly for widespread deployment. In lieu of measurable improvements in local water quality, modeled reductions in phosphorus loading, numbers of trades, trading partners, and acreage under conservation because of WQT are reasonable measures of success.

Drivers for a robust, multi-jurisdictional trading market for permit compliance were not apparent when this Framework was devised. A final measure of success would thus be future reliance on this Framework by state and provincial water quality regulatory authorities as an alternative means of achieving water quality objectives.

B. Eligibility: WQT in the Western Lake Erie Basin

1. Eligible Trading Partners

Any entity that is able to operate within the constraints established by this Framework and take action(s) that result in a demonstrable net reduction of phosphorus loads to the WLEB may be an eligible trading partner to the extent allowed by the relevant jurisdiction(s). Trading partners may be private or public entities. Eligible credit buyers include (but are not limited to) NPDES permittees such as municipal WWTPs, industrial facilities, and municipal separate storm sewer systems (MS4s). In Ontario, eligible point sources would include holders of authorizations to discharge wastewater. All eligible buyers, whether in the United States or Canada, must currently operate under water quality-based limitations controlling phosphorus in authorized discharges.

⁸ State of Ohio, Chapter 3745-5 of the Administrative Code, effective November 1, 2012.

⁹ <https://www.ontario.ca/laws/statute/90o40#BK114>

This Framework is structured to support credit generation from agricultural land¹⁰. Other means of credit generation are not specifically addressed by this Framework. “Eligible agricultural credit generator” (i.e. the seller) is broadly defined and inclusive of traditional row crop agriculture producers, but may also include conservancies, county farms, and park districts who own or manage rural (working) lands. Importantly, any entity wishing to generate and sell WQT credits under this Framework must also implement Nutrient Management¹¹. This pre-requisite for trading phosphorus credits is based on the increasing scientific evidence that individual conservation practices such as cover crops, conservation tillage, or no-till are demonstrably more effective at reducing phosphorus, and dissolved reactive phosphorus in particular, when coupled with Nutrient Management.

2. Types of Trades

The primary focus of this Framework is to facilitate PS to agricultural NPS trades where a PS acts as the credit buyer and a NPS acts as the credit generator/seller. However, trades between any combination of PS and NPS are also allowed under this Framework. A trade between an agricultural credit generator and another party that is not subject to discharge limits for phosphorus would be allowed and considered a NPS to NPS trade¹². Any PS subject to phosphorus discharge limits that can reduce phosphorus beyond the current discharge level¹³, may translate surplus reductions into credits for sale, potentially leading to PS to PS trades.

3. Pollutants to be Traded

This Framework is designed to facilitate the trading of Total Phosphorus (TP) which is inclusive of both sediment-attached/particulate phosphorus as well as Dissolved Reactive Phosphorus (DRP). While past efforts at improving water quality have focused on the reduction of particulate phosphorus, studies have indicated that 50%

¹⁰ Concentrated animal feeding operations (CAFOs) may act as credit generators for TP load reductions that go above and beyond their NPDES permit and/or any other regulatory requirement.

¹¹ For the purposes of this Framework, “Nutrient Management” means that any producer proposing to generate phosphorus credits must adopt an acceptable nutrient management program to provide greater certainty in credit calculations. Nutrient Management programs include:

- NRCS staff/Technical Service Provider (TSP)-approved Nutrient Management Plans consistent with Practice Standard 590;
- 4R Nutrient Stewardship Certification Program-approved Nutrient Management Plans
- Nutrient Management Plans adopted within Ohio’s Senate Bill 150, effective August 21, 2014.

Entities may submit an alternative nutrient management plan for credit eligibility, however the Program Administrator will consult with a team of agronomic experts to first determine if the technical contents of the proposed plan are science-based, sufficiently comprehensive, and repeatable between field representatives for use in the WQT program.

¹² A WQT trade that is not for compliance purposes is often referred to as a “stewardship trade.” In general, WQT programs do not apply a trade ratio for stewardship trades. Entities that are not subject to phosphorus regulations can emerge as credit buyers for stewardship-driven purchases.

¹³ Based on loading at median flow and concentration for the preceding three calendar years.

to 80% of TP leaving fields in the WLEB is in dissolved form^{14,15}, making DRP an important consideration for assuring that a net decrease of TP loading is achieved through the generation of credits.

4. Eligible Trade Areas

Trading is permitted between any two parties that are located within the WLEB footprint depicted in Figure 1, if net phosphorus load reductions are certified and verified using the protocols outlined in this Framework and the proposed trade does not violate the prohibitions described in Section 5 below. Both upstream and downstream crediting may occur under this Framework.

Upstream crediting refers to a scenario where the credit seller is located upstream of the buyer with respect to the final receiving water (Lake Erie). Upstream crediting is preferred, since the load reduction achieved by the seller may yield a water quality benefit for all downstream waters, thus directly offsetting the increased phosphorus loading of the buyer.

Downstream crediting refers to a scenario where the seller is located downstream from the buyer with respect to Lake Erie. In this scenario, the receiving water downstream from the buyer but upstream from the seller does not receive a direct water quality benefit from the seller's credit-generating activities. While this scenario runs a higher risk of violating the prohibitions described below, it is possible to achieve a net reduction in phosphorus loading to Lake Erie and comply with all other aspects of this Framework. Therefore, downstream crediting will be considered in the Erie P Market.

5. Prohibitions

WQT may not cause or contribute to the formation of local water quality hot spots. Hot spots are defined as: a) a violation of water quality standards; b) an impairment of an existing use or designated uses, or; c) an adverse water quality effect at an intake for a drinking water supply. For this reason, the location of credit-generating projects will be dictated by receiving water conditions. Thus, while upstream or downstream credits may be considered, downstream crediting shall not adversely impact local water quality as noted herein.

Phosphorus load reductions and associated credits calculated through methods not specifically adopted within this Framework (See, Section C and Appendix B) or demonstrated through edge of field monitoring, are prohibited.

¹⁴ United States Department of Agriculture, Natural Resources Conservation Service-Conservation Effects Assessment Project (CEAP). 2016. Effects of conservation practice adoption on cultivated cropland acres in Western Lake Erie Basin, 2003-06 and 2012

¹⁵ Smith, D., K. King, L. Johnson, W. Francesconi, P. Richards, D. Baker, and A. Sharpley. 2014. Surface runoff and tile drainage transport of phosphorus in the Midwestern United States. *Journal of Environmental Quality*.

C. Generating Credits

1. Credit Calculation overview

Credits for sale within the WLEB must reflect quantified reductions in phosphorus loading as an improvement over a relevant baseline condition.

a. Agricultural NPS baseline

For the purposes of this Framework, the baseline condition, or starting point from which phosphorus reductions can be calculated for credit generation, is the current condition of the field or fields before new or additional credit-generating activities are implemented. The current condition must be documented with at least 3 preceding years of cropping data, including at least one round of phosphorus sampling in soils. Further, eligible agricultural credit-generating practices must document compliance with any applicable regulations and be implemented in conjunction with Nutrient Management.

b. PS baseline

The PS baseline condition, or starting point from which phosphorus reductions can be calculated for credit generation, is the lower of the relevant water quality based effluent limit for phosphorus within an active NPDES permit or other wastewater authorization (including limitations based on load allocations established by an approved Total Maximum Daily Load in the U.S.) or the current discharge level. As with agricultural credit generators, PS credit generators shall demonstrate performance over at least a 3-year period preceding any application for approval to sell credits.

c. Effect of impaired water (e.g., TMDL) designation(s)

For trades proposed within U.S. watersheds with a USEPA-approved total maximum daily load (TMDL), this Framework's 3:1 trade ratio (see Section C-3) is sufficiently conservative to ensure that trades will meet federal water quality objectives.

2. Quantifying load reductions

a. Load Reduction Quantification

Phosphorus reductions shall be quantified using the U.S. EPA Region 5 spreadsheet model¹⁶ for particulate phosphorus along with a Pennsylvania Department of Environmental Protection (DEP) model for DRP modified for trading within the WLEB (WLEB-DRP calculator). Reductions may also be quantified through direct edge of field monitoring. DRP has been identified as a form of phosphorus that is a principal driver of harmful algal blooms in the WLEB. Because the Region 5 Spreadsheet model does not address dissolved forms of phosphorus, this Framework also recommends use of the WLEB-DRP calculator.

The Region 5 model is currently recommended for WQT under Ohio's trading rules as well as the Ohio River Basin Water Quality Trading Pilot Project.

¹⁶ This Microsoft Excel-based model provides spreadsheets to calculate load reductions of sediment, nitrogen and phosphorus from selected agricultural and urban BMPs and bank stabilization. The model is based on the Universal Soil Loss Equation. Users need to input the: Rainfall-Run-off Erosivity Factor (R); Soil Erodibility Factor (K); Length-Slope Factor (LS); Cover Management Factor (C), and; Support Practice Factor (P).

Indiana and Michigan also use this tool for NPS load reduction quantification. Other quantification methods not identified here may be proposed by credit generators for case-by-case consideration. Specific considerations will focus on an update to the Region 5 model once states have adopted this, and/or the USDA-NRCS Nutrient Tracking Tool (NTT)¹⁷ when this becomes available in a form calibrated for the WLEB.

i. Region 5 Spreadsheet Model

This field-scale model provides calculation procedures for estimating upland sheet and rill erosion, as well as gully and bank erosion. The sheet and rill erosion estimations are based on the Revised Universal Soil Loss Equation (RUSLE) and a sediment and particulate erosion enrichment procedure developed and documented as part of the Chemicals, Runoff, and Erosion from the Agricultural Management Systems (CREAMS) model. The gully and bank erosion estimates are based on the volume of material voided by channelized flow during the time in which the erosion occurred. The estimation processes combine the parent material soil nutrient concentrations and estimates of dry density to estimate only sediment-attached and particulate forms of nutrients. Different national programs apply their own estimation methods to assess delivery ratios. The spreadsheet model is available online at:

[http://it.tetrattech-ffx.com/steplweb/models\\$docs.htm](http://it.tetrattech-ffx.com/steplweb/models$docs.htm)

(scroll down to view documents relating to the Region 5 Load Estimation Model).

ii. WLEB-DRP Calculator

An explanation of the WLEB-DRP calculator and instructions on how to use it for estimating load reductions and credit calculations for WQT in WLEB is included in Appendix B.¹⁸ The WLEB-DRP calculator should be used to assess newly adopted phosphorus application rate improvements and/or addition of a fertilizer incorporation method immediately following application. If the operation's previous Nutrient Management already specified agronomic nutrient application rates and incorporation, no credits from the resulting DRP load reductions can be generated. However, if the operation is adopting Nutrient Management approaches for the first time, then the DRP portion of the TP credit may be generated for up to five years from implementation. The WLEB-DRP Calculator is available online at:

¹⁷ This water quality estimator was designed to quantify the change in nitrogen, phosphorous and sediment loss potential from changes in land management practices. The tool also estimates changes in crop yield. NTT has been used in select WQT programs in the U.S. to estimate load reductions associated with conservation practices implemented on cropland. When a calibrated version of NTT becomes available in the WLEB, this Framework will move to adopting its use for load reduction and credit calculations.

¹⁸ The WLEB-DRP calculator yields DRP load reductions for surface runoff only. A copy of the WLEB-DRP Calculator can be found online on the GLC website. Although it is recognized that sub-surface drainage tile is a key contributor and important concern for DRP loadings into WLEB, at present, there is no readily available load calculation tool to estimate dissolved phosphorus loads from drainage tiles. NTT, when available, will likely include a calculation for drainage tiles.

b. Conservation Practices Suitable for Credit Generation Using the Region 5 Model

The following USDA-NRCS Field Office Technical Guide (FOTG) Practice Standards can be evaluated for TP reductions using the Region 5 model, and are therefore eligible for generating phosphorus credits for WQT in the WLEB.

1. Conservation Crop Rotation (Code¹⁹ 328)
2. Conservation Cover (Code 327)
3. Conservation Reserve Program (FSA program)²⁰
4. Contour Buffer Strips, (Code 332)
5. Contour Strip Cropping (Code 585)
6. Cover Crop (Code 340); (Ohio EPA approved a specific calculation also found in the Region 5 model package)
7. Critical Area Planting (Code 342)
8. Field Boarder (Code 386)
9. Filter Strip (Code 393)
10. Residue and Tillage Management, No Till (Code 329)
11. Residue and Tillage Management, Reduced Tillage (Code 345)
12. Prescribed Grazing (Code 528)
13. Riparian Forest Buffer (Code 391)
14. Riparian Herbaceous Cover (Code 390)
15. Tree and Shrub Establishment (Code 612)
16. Vegetative Barrier (Code 601)
17. Grade Stabilization Structures (Code 410)
18. Grassed Waterway (Code 412)
19. Water and Sediment Control Basins (Code 638)
20. Bank stabilization - applied in the same manner as Streambank and Shoreline Protection (Code 580)
21. Animal Trails and Walkways (Code 575)

Other BMPs not identified in this Framework shall require documentation of proposed quantification procedures for approval by the Program Administrator on a case-by-case review. Quantification protocols for best management practices proposed for credit generation in urban settings shall be determined at a later date.

3. Credit Calculation and Application of Trade Ratios

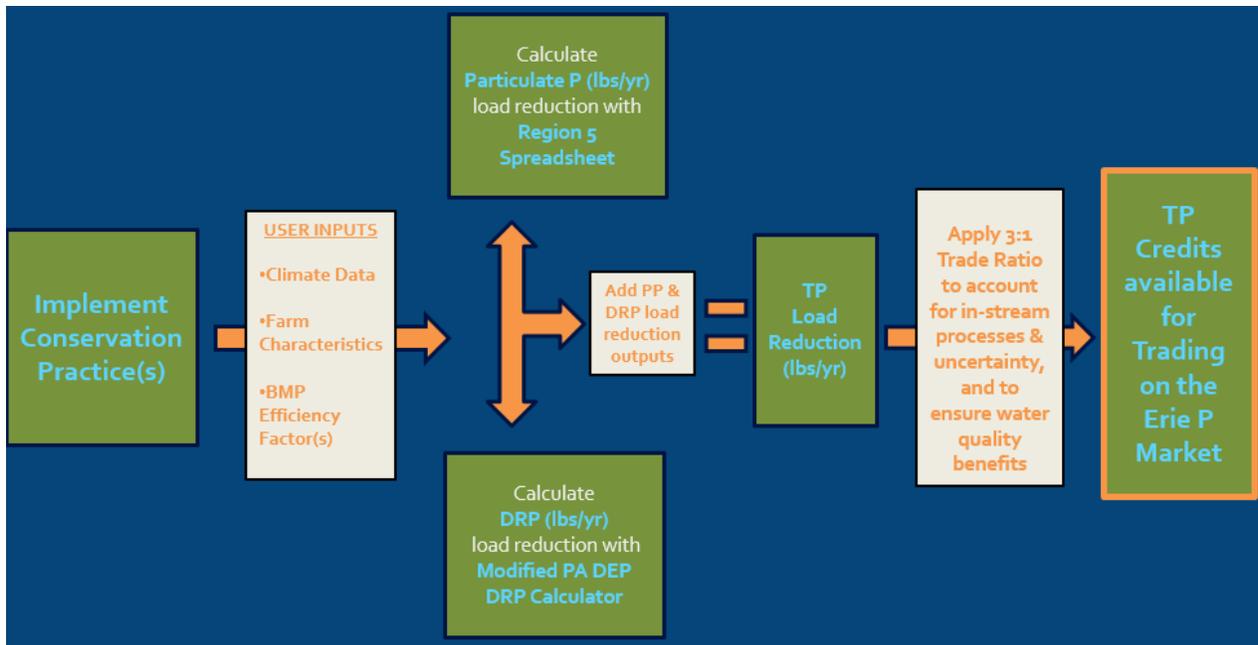
NPS load reductions shall be estimated using the Region 5 Spreadsheet Model for particulate phosphorus and the WLEB-DRP calculator to determine the TP load reduction, calculated as pounds of phosphorus reduced. This

¹⁹ NRCS FOTG Section IV Practice Code

²⁰ Taking land out of production, a practice supported by the Conservation Reserve Program and other USDA cost-share programs, is often an activity that results in significant reductions in nutrient loads, and by extension, significant credit generation. WQT may present an opportunity to offset the cost of taking land out of production, provided that credit pricing (1) accurately accounts for the foregone value that would arise were the land cropped and (2) does not overlap with federal assistance payments.

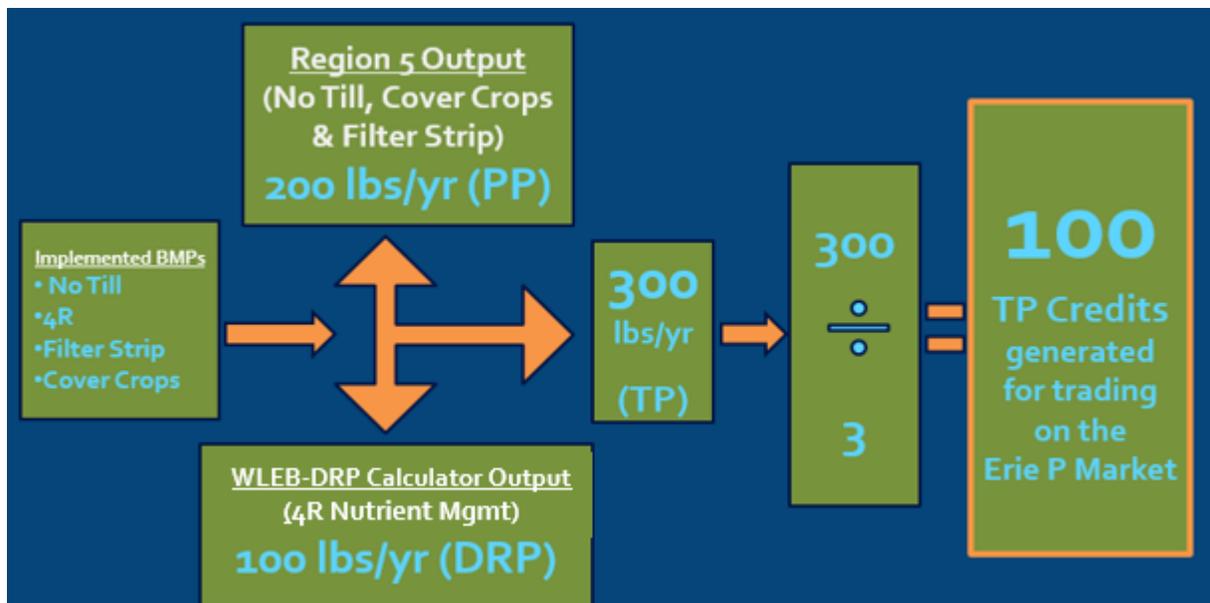
Framework calls for a 3:1 trade ratio: for every three pounds of phosphorus reduced, one credit shall be generated that is available for sale through WQT²¹. Thus, the combined TP load is divided by 3 to determine WQT credits as follows:

²¹ PS-PS trades must meet a trade ratio of 1.1:1 to assure a net water quality benefit.



Credit Calculation Example Scenario:

Farmer Brown lives in Defiance County, Ohio where he owns and operates a 100-acre corn and soy bean farm. After hearing about the newly introduced Erie P Market, Farmer Brown decides to improve his field management practices and make some extra money. Working with the local conservation district, he designs and implements a conservation plan that includes: (1) no-till (2) 4R nutrient management (3) the installation of a filter strip along the down-slope boundary of his property, and (4) planting 50-acres of cover crops. Using regional climate data, the results of his Mehlich 3 Phosphorus tests, and other detailed knowledge of his farm’s characteristics, Farmer Brown calculates his Credits to be traded on the Erie P Market as follows:



4. Credit timing/availability

Credits are calculated annually by water year (October 1 through September 30, of the calendar year in which it ends) and may vary year-to-year by credit-generating practice. Credits are available upon verification of practice installation.

Each credit has a vintage year as the year in which credits were first generated. For permanent practices, it is possible to regenerate a credit each year by continued deployment of credit-generating practices through the life of the practice as determined by NRCS and duration of the WQT Contract²². Annual practices and other activities that may result in variability of credits year-to-year shall be documented and clearly denoted within the WQT Contract, for its duration.

D. Certification, Verification, & Tracking

1. Credit Certification

Credit certification is the process of pulling together and reviewing all the documentation that can be used to demonstrate TP load reductions and the generation of credits. This includes all administrative and technical aspects of proposed trades. The purpose of certification is to ensure that practices and calculations adhere to all Framework requirements.

a. Reviews of Proposed Trades:

Proposed trades will be documented and submitted as Project Applications to the Program Administrator²³ for review of information certifying adequate project design in accordance with NRCS practice standards and a technical review of quantification methods and calculations. This credit certification task may be performed by a regulatory agency, a third party, a Soil & Water Conservation District (SWCD) or the Program Administrator.

b. Timing of Credit Issuance:

Phosphorus reductions shall be recognized for credit use after: 1) credit certification by the Program Administrator, and; 2) verification that credit generating practices have been installed per the approved Project Application. The Program Administrator will denote that credits are available for use once completed certification and verification forms are made available to the Administrator.

2. Credit Verification

Credit verification refers to the on-site inspection of all agricultural conservation practices installed to generate WQT credits. The purpose of verification is to ensure that all installed practices adhere to the stipulations of the approved Project Application. Credits cannot be used on the Erie P Market until after the verification process is successfully completed.

a. Verification of Project Installation:

Once credit-generating practices have been installed by the seller, notice is given to the "Verifier" (and entity or individual mutually-agreed to by the trading partners as appropriate to conduct verification inspections). Onsite

²² In many instances, the WQT Contract will expire before the life expectancy of the permanent practice ends.

²³ Program Administrator means the Great Lakes Commission through September 30, 2018. After that date, GLC's role as the Program Administrator will be subject to the availability of funding.

inspections by Verifiers promotes the legitimacy and transparency of the program by ensuring credit-generating practices are properly installed and that water quality benefits can be expected as reflected in the Project Application. State agencies, SWCDs, or approved third-parties may perform onsite verifications so long as individuals are trained in agricultural conservation practice design and installation.

Completed verification forms shall be submitted to the Program Administrator within 5 days of the inspection. Should inadequacies with installation be identified, these will be submitted to the credit generator within 3 days of discovery. Once corrections are made and a second inspection is completed, inspection forms shall be submitted within 5 days to the Program Administrator. In the event of disagreements between credit generators and verifiers, the Program Administrator shall intervene to negotiate mutually-acceptable outcomes. The Program Administrator retains the final right of refusal on project verification matters.

b. **Frequency of Ongoing Project Reviews**

WQT credit-generating projects will be inspected for satisfactory operation and maintenance per the approved Project Application via periodic site visits. The appropriate schedule for ongoing verification of WQT projects shall minimally be once per year. These verification reviews shall be performed by verifiers as identified within the WQT Contract. Practice failures or performance issues will be reported in writing to the Program Administrator within 3 days of discovery in writing using the appropriate inspection form. Responsible parties will be required to make corrections as necessary to maintain adequate credit coverage for the credit buyer's compliance needs within 90 days of the discovery of a failed verification. The process and protocols for notification, cure and reinstatement, or cancellation of credits due to practice failure or performance issues shall be established and approved in advance of any trades. Administration of these steps shall be the responsibility of the Program Administrator.

3. **Credit Tracking: Developing a Registry**

A credit registry shall be developed and maintained by the Program Administrator to publicly document WQT transactions made in accordance with this Framework. All credit-generating practices shall be serialized upon entry to the registry. This will allow the Administrator to easily locate, verify, and edit information as credit demand increases. A registry will also provide transparent tracking of WQT transactions within the program.

The registry, which currently does not exist, shall minimally maintain the following information on credit generation and use in order to track WQT activities:

- Credit Generating Entity Information (Non-confidential)
 - Name/Contact Information
 - Watershed Location (HUC#)
 - Crediting Project Identifier (i.e., serial #)
- Credit Generation Information
 - Credit Generating Practice Type (Agricultural or urban)
 - Crediting Project Installation Date

- Lifetime of Practice
- Lifetime of credits
- Credit Calculation Method
- Estimated Reductions
- Credit Certification
- Project Verification/verifying entity
- Retirement date of credits
- Project Monitoring
- Actual Credits
- Buyer Information
 - Credits Needed/Used
 - Regulated Discharger Contact/Permit Information
 - Watershed Location (HUC#)
 - Compliance Year (timeframe)
 - Credits Purchased/Used
 - Public Accessibility to Trading information

E. Maintaining the Integrity of the Trade: Other Performance Tools

1. Public participation

NPDES permits or wastewater authorizations where facilities will be using water quality trades to achieve compliance with regulatory requirements will be public noticed in the same manner as all proposed permitting or authorization decisions by the regulatory authority.

2. Regulatory agency oversight & enforcement

Each jurisdiction retains its full regulatory oversight and enforcement authority for permits or authorizations issued by that jurisdiction, including any special conditions that allow for WQT.

F. Alignment with existing water quality monitoring regimes

Jurisdictions may elect to require that relevant information be shared for the purpose of monitoring water quality improvements that may be attributable to credit-generating activities.

G. Risk Assurance

The Erie P Market relies on a multi-pronged approach to manage risks that may arise over the course of a water quality trade. While these risks may affect both buyers and sellers, particular attention is paid toward mitigating any potential risk to water quality.

1. Contract provisions

By executing a WQT Contract, trading partners agree to numerous contractual provisions intended to assure performance consistent with modeled conditions, account for unforeseen conditions, and provide remedies to cure any deficiencies. The template contract in Appendix C, for example, has provisions that address risks related to failures to perform or underperformance of credit-generating practices.

2. Trade ratios

A trade ratio of 1.1:1 shall apply for credits generated by a PS and used by another PS. A 3:1 trade ratio is applied to nutrient load reductions generated by agricultural NPS credit generators. The application of this 3:1 trade ratio is consistent with Ohio's Water Quality Trading Rule.²⁴ Both ratios serve to assure that water quality benefits are achieved by requiring more phosphorus reduction than use.

For example, the 3:1 PS-NPS source trade ratio requires a user of NPS credits to purchase 3 pounds of reductions from agricultural sources for every one pound it uses for compliance in a water quality trade. This 3:1 ratio includes an uncertainty factor equivalent to 1:1 addressing uncertainty in load calculations, fate & transport in the environment,²⁵ and pollutant equivalence between the credit source and credit user. An equivalent pollutant offset factor addresses the direct reduction at 1:1 between sources. The remaining 1:1 factor addresses programmatic requirements for implicit credit retirement to ensure a net water quality benefit. Together, these three factors represent the 3:1 PS/NPS trade ratio.

3. Credit Reserve Pools

In a more-robust future market, up to 10% of credits may be set aside in a credit reserve pool. The credit reserve pool insures net water quality benefits against

- a. Failure of a party to realize contractual obligations and
- b. BMP failure

For pilot trades, the reserve pool will be created by the Seller through production of excess credits insuring the purchased amount.

4. Additional assurances for buyers and sellers

a. Use of standard BMP designs

The design and performance standards of agricultural conservation practices will be based on NRCS standards for construction and maintenance, or other standards specified by the Program Administrator. Other design and performance standards for conservation practices (and urban stormwater BMPs) not identified in this Framework shall require documentation within the Project Application demonstrating the validity of the proposed approach to the Program Administrator on a case-by-case basis.

b. Use of credit reconciliation period

An adequate supply of credits shall be maintained for compliance. Recognizing that agricultural conservation practices may fail for a variety of reasons and consequently result in a loss of credits, a credit buyer must either purchase other reductions from credit-generating practices not already obligated to other buyers within 90 days of a practice failure, or ensure corrections are made to the failed practices within the same time period. This 90-day window is considered the "credit reconciliation period." Credit buyers may wish to increase their portfolio of credit-generating practices as a buffer for potential practice failures, or rely on third-party credit aggregators to ensure there is a credit reserve to mitigate potential shortfalls.

²⁴ OAC Chapter 3745-5 Water Quality Trading (see: http://epa.ohio.gov/dsw/rules/3745_5.aspx).

²⁵ A review of USGS SPARROW modeling suggests persistence of TP in WLEB basins is 94% or greater. Thus, there are limited internal losses of TP once TP loads enter tributaries.

H. Market Structure *(Recommended approach TBD)*

1. Overview of market structure

The recommended market structure is a bi-lateral process that requires the signing of contracts between (1) the buyer and seller, and (2) the buyer and the certifier and verifier(s). The program administrator oversees the trading process, takes the lead role in recruiting potential buyers, and gives the final approval for trades.

Erie P Market Process Flow Chart: *Bi-Lateral Trades for Compliance*



Each role can be filled as follows:

- **Credit Seller:** This role will be filled by an individual farmer or any private, public, or non-profit entity that engages in agricultural production and meets all eligibility requirements for participation in the Erie P Market (see Section B.1).
- **Credit Certifier & Verifier:** Several entities may be eligible to serve as the verifier or certifier (or both simultaneously); the filling of these roles will vary between jurisdictions based on administrative considerations, levels of expertise and specialization, resource availability, and other factors. In addition, these roles may vary between individual trades to allow sellers to work with entities that they have pre-existing professional relationships with. Eligible entities include local conservation districts, state agencies, or highly qualified private crop advisors or technical consultants.

- **Project Administrator:** The Great Lakes Commission will fill this role through the end of September 2018, and thereafter subject to funding availability and need. Please contact the Great Lakes Commission to determine whether the, or another entity, is best suited to serve this role for future trades.
- **Credit Buyer:** For compliance trades, this role is filled by a NPDES permittee who is operating under a phosphorus limit, and meets all other eligibility requirements for participation in the Erie P Market (see Section B.1). However, the market is not restricted to permittees, and any interested private, public, or non-profit entity may purchase credits to further stewardship goals and/or initiatives.

While a transaction with a non-permittee acting as the buyer would not be considered a compliance trade, the Erie P Market Framework and market structure have been designed to also accommodate stewardship crediting. If in the future there is a significant demand for stewardship credits, an alternative clearinghouse structure should be considered. This alternative market structure would be used to streamline and simplify the process by removing considerations such as permit limits and trade ratios that would no longer apply. In addition, instead of bi-lateral trades, the Program Administrator would serve as a credit aggregator who would interface directly with interested buyers.

2. Credit pricing and use of public funds

For buyers and sellers within the WLEB states, credit pricing for eligible conservation practices will be based on the NRCS-Environmental Quality Incentives Program (EQIP) Practice List and Payment Schedules from the year that trading contracts are signed. In cases where payments vary between the states, the Erie P Market will base credit pricing on the highest payment.

The price of a credit is determined by the sum of all of the cost inputs that go into generating a credit. These include the costs of the credit-generating practices itself (a direct cost) and additional costs that arise through the transaction (indirect costs like fees for certification, verification, and contract reviews).

If a point source pays for 100% of the credit-generating practice and associated fees for water quality trading, the price of the credit is relatively easy to calculate. In instances where public funds are helping to support credit-generating practices, it may be desirable to price credits based on the investment made by the Buyer. This is called “proportional crediting” and it can impact the price of a credit. This Framework recommends proportional crediting to assure the instances of double payment are avoided.

Credit prices will be established on a case-by-case basis in consideration of both the direct and indirect costs arising from a proposed trade.

I. Trading Contracts and Other Templates

The following forms may be used to track the complete trading process from start to finish. These forms can also serve as a template that the Program Administrator may alter if necessary to accommodate specific needs and trading scenarios. In addition, the

Program Administrator may choose to use other equivalent contract and template forms, as long as they adhere to all requirements of the Erie P Market. These forms cover each step of the process; from the initial application to the verification or denial of a completed proposed trade. A copy of each form can be found in Appendix C.

1. [Project Application](#)

The Project Application will be completed by county technical staff (or the seller's preferred approved conservation partner) on behalf of the seller, and submitted to the program administrator.

2. [Notification of Award](#)

The Notification of Award will be completed by the Program Administrator and delivered to the seller upon the successful submittal of the project application, and completion of the certification process.

3. [Installation Report & Certification](#)

The Installation Report & Certification will be completed by the credit verifier following the seller's receipt of the Notification of Award and subsequent installation of the required credit-generating practices. Once completed, this form will be submitted to the Program Administrator, the buyer, and the seller.

4. [Practice Verification Report](#)

The Practice Verification Report will be completed by the verifier, and submitted to the program administrator, the buyer, and the seller upon the successful verification of installed practices.

5. [Credit Suspension, Reinstatement, or Cancellation Report](#)

The Credit Suspension, Reinstatement, or Cancellation Report will be completed by the verifier, and submitted to the program administrator, the buyer, and the seller in the event that installed practices are not successfully verified.