

**DRAFT DISCUSSION PAPER**  
**APRIL 2003**  
**NUTRIENT CREDIT TRADING FOR**  
**WATERSHED IMPROVEMENT**  
**PA DISCUSSION PAPER**

**PURPOSE:**

The purpose of this document is to:

- Help identify fundamental issues related to water credit trading; and
- Help gather options for addressing fundamental trading issues.

The majority of this discussion paper is taken directly from EPA's Water Quality Trading Policy and the Chesapeake Bay Program's Nutrient Trading Fundamental Principles and Guidelines.

The successes of air trading have also helped in the drafting of this document. Air trading and the resulting environmental gains provide a model for incorporating pollution prevention concepts and regulatory goals. Successful elements of air trading include: requirements for demonstrating that credits are surplus, permanent, and quantifiable; the use of new technologies, processes and equipment to meet environmental goals; use of registries to record credits; transparent processes that provide information to the public; and reciprocity among states.

The information gathered through the use of this document would be used to help draft a fundamental document that would serve as a framework and describe basic processes for water trading in Pennsylvania, and associated activities such as offsets, retiring and banking. It is anticipated that supporting details would be published in separate future technical guidance.

**BASIS:**

Clean Water Act, Clean Streams Law, and the federal Water Quality Trading Policy.

**APPLICABILITY:**

This document is intended to apply to and support watershed stakeholders interested in implementing water quality trading projects, for reasons such as:<sup>1</sup>

- Achieving early reductions and progress towards water quality standards pending development of Total Maximum Daily Loads (TMDLs) for impaired waters.

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<sup>1</sup> Bullets from EPA Final Policy, Sec. II, and a statement about the Bay

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- Reducing the cost of implementing TMDLs through greater efficiency and flexible approaches.
- Establishing economic incentives for voluntary reductions from all sources within a watershed.
- Reducing the cost of compliance with water quality-based requirements.
- Offsetting new or increased discharges resulting from growth in order to maintain levels of water quality that support all designated uses.
- Achieving greater environmental benefits than those under existing regulatory programs. DEP supports the creation of water quality trading credits in ways that achieve ancillary environmental benefits beyond the required reductions in specific pollutant loads, such as the creation and restoration of wetlands, floodplains and wildlife and/or waterfowl habitat.
- Securing long-term improvements in water quality through the purchase and retirement of credits by any entity.
- Combining ecological services to achieve multiple environmental and economic benefits, such as wetland restoration or the implementation of management practices that improve water quality and habitat.
- Reducing the cost of meeting tributary strategies and other activities resulting from agreements such as the Chesapeake Bay 2000 Agreement.

**DEFINITIONS:** Water quality trading, credits, baselines, trading projects, offsets, incentive-based, market-based, watershed, banking, retiring, net reduction, point source, nonpoint source, etc. (TBD)

## FUNDAMENTALS:

Water quality trading and other market-based projects must be consistent with the Clean Water Act<sup>2</sup>, the Clean Streams Law, and other federal, state and local laws and regulations.<sup>3</sup> It is also the intention that trading in Pennsylvania watersheds will be consistent with U.S. EPA policies and guidance at the federal and regional level, including the Chesapeake Bay Program, and other regional and local policies and guidances that relate to watershed management, such as the Chesapeake Bay Agreement<sup>4</sup>. Pennsylvania may find it necessary to take approaches that differ from these guidances and policies, in order to maintain the flexibility needed to help meet and exceed environmental objectives.

It is the intention that trading will be consistent with, and integrated with, the Commonwealth's Watershed Approach, including development and implementation of TMDLs.

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<sup>2</sup> EPA policy Section III.A

<sup>3</sup> CBP Principle # 3

<sup>4</sup> CBP Principle #4

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Trading offers substantial opportunities for environmental gain, but care must be exercised to use it so that benefits are not overshadowed by unintended and undesirable impacts on water quality.

Trading projects will be developed with stakeholder involvement and public input, and will be implemented in a way that provides stakeholders and the public with access to information about trades, conformance with trading policies and guidelines, and credit performance.<sup>5</sup> Trading activities cannot produce water quality effects locally or downstream that violate water quality standards or criteria; cause an impairment of existing or designated uses; adversely affect water quality at an intake for a drinking water supply; adversely impact living resources and habitat; or create an exceedance of a cap established under a TMDL.<sup>6</sup>

## I. BACKGROUND

Finding solutions to complex water quality problems requires innovative strategies that are aligned with core water programs. Water quality trading is an innovative approach that offers greater efficiency in achieving water quality goals on a watershed basis. The National Cost to Implement TMDLs Draft Report estimates that flexible approaches to improving water quality could save up to 25% annually. Other studies have estimated that trading and other market-based approaches could save anywhere from 10% to over 50% compared to approaches without incentive-based features.<sup>7</sup>

In the Fall of 2000, DEP began investigating how trading could be applied in Pennsylvania watersheds. This followed a Joint Legislative Air and Water Pollution Control and Conservation Committee hearing on Water Quality Credits and Trading held by the Pennsylvania Legislature in August 2000, and DEP's participation on the team that developed the *Chesapeake Bay Program Nutrient Trading Fundamental Principles and Guidelines* (finalized in March 2001). DEP's trading initiative involved two parallel efforts: developing a trading pilot in one watershed, the Conestoga<sup>8</sup>; and developing a framework to guide trading in any Pennsylvania watershed. This document is based on those experiences, as well as a review of trading programs underway and in development elsewhere in the United States.

## II. GENERAL

Water quality trading projects and credits must be developed according to this document and submitted to DEP for review and approval. Projects may involve a single trade between two parties, a few trades in a small watershed, a program that supports multiple trades on an ongoing basis, or purchase of credits by third parties. DEP also will consider proposed trades as part of a NPDES permit (re)issuance or revision process, or as part of a TMDL development and implementation process. Parties interested in investigating trading

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<sup>5</sup> CBP Guideline #35

<sup>6</sup> EPA policy III.F.5. and CBP Principle #1

<sup>7</sup> Cite EPA August 2001 TMDL Report, WRI report, and WERF reports.

<sup>8</sup> CBP Guideline #34

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opportunities and establishing a project in their watershed are encouraged to contact DEP for additional guidance and assistance.

## A. Water Quality Benefits

Water quality trading has the potential to achieve water quality and environmental benefits equal to or greater than may otherwise be achieved under more traditional regulatory approaches.<sup>9</sup> To ensure that this potential is achieved and that trades do not adversely impact water quality, parties sponsoring and involved in trades must demonstrate the conditions listed below are met. General roles and responsibilities for these demonstrations are outlined in Section B of this document. Specific roles and responsibilities should be described in other documents relating to a watershed-based trading project or a specific trade.

### Credit Use Generally

Credits shall not be used in any way that would:

- Cause an impairment of existing or designated uses,
- Produce water quality effects locally or downstream that violate water quality standards or criteria;
- Adversely impact living resources and habitat;
- Exceed a cap established under a TMDL; or
- Adversely affect water quality at an intake for drinking water supply.<sup>10</sup>

### Antibacksliding

Antibacksliding provisions of Section 303(d)(4) of the Clean Water Act will generally be satisfied:<sup>11</sup>

- Where a point source increases its discharge
  - through the use of credits in accordance with alternate or variable water quality based effluent limitations contained in an NPDES or general permit,
  - in a manner consistent with provisions for trading under a TMDL, or
  - consistent with the provisions for pre-TMDL trading included in a watershed plan.
- Where a point source generates pollution reduction credits by reducing its discharge below a water quality based effluent limitation (WQBEL) that implements a TMDL or is otherwise established to meet water quality standards and it later decides to discontinue generating credits, provided that the total pollutant load to the receiving water is not increased, or is otherwise consistent with Pennsylvania's antidegradation policy.

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<sup>9</sup> See EPA Policy, I, page 1 Para 4.

<sup>10</sup> Bullets from EPA Final Policy, section Sec.II, and a statement about the Bay

<sup>11</sup> EPA Policy Section III.F.6.

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## Antidegradation

The purpose of Pennsylvania's Antidegradation Program is to protect existing and designated uses of all surface waters and to protect existing quality of High Quality (HQ) and Exceptional Value (EV) waters.<sup>12</sup> Trades that meet the requirements of this document will not result in "lower water quality" as that term is used in 40 CFR 131.12(a)(2), and therefore will not require antidegradation review where the trades:

- Achieve a no net increase of the pollutant traded, and
- Do not result in any impairment of designated uses.<sup>13</sup>

## Trading Where Water Quality Standards are Being Met

Trading may be used to maintain high water quality in waters where water quality standards are attained, such as by compensating for new or increased discharges of pollutants.<sup>14</sup>

## Trading in Impaired Waters: Pre-TMDL Waterbodies<sup>15</sup>

Trading may be conducted in impaired waters prior to the completion, approval, or implementation of a TMDL when the trades are projected to help achieve progress toward attaining water quality standards. This must be accomplished in one of the following ways.

- In waters impaired by pollutant loading:<sup>16</sup>
  - Individual trades must achieve a net reduction of the pollutant traded; or
  - Watershed-scale trading programs must reduce loadings to a specified cap supported by baseline information on pollutant sources and loadings.
- In waters where pollutants are not the primary cause of the impairment and reducing pollutant loads alone will not be a sufficient or cost-effective solution:
  - Pre-TMDL trades must demonstrate a direct environmental benefit relevant to the conditions or causes of impairment that will result in progress towards restoring designated uses.

After a TMDL has been approved or established by EPA, the reductions made to generate credits for pre-TMDL trading may no longer be adequate to generate credits under the TMDL. This will depend on the remaining level of reduction needed to achieve water quality standards and, where applicable, the allocation of point and nonpoint source pollutant loads established by the TMDL.<sup>17</sup>

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<sup>12</sup> Addresses EPA Final Policy III.F.7.

<sup>13</sup> EPA Final Policy, Sec. III.F.7.

<sup>14</sup> EPA Policy, Sec. III.E.1.

<sup>15</sup> EPA Policy, Sec. III.E.2.

<sup>16</sup> CBP Principle #5

<sup>17</sup> EPA Final, Sec. III.E.2.

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## Trading Under an Approved TMDL

Trades and trading programs in impaired waters for which a TMDL has been approved should be consistent with the assumptions and requirements upon which the TMDL is established. This also will involve ensuring that the baselines established to determine when credits are created and how they may be applied are consistent with the wasteload and load allocations established by the TMDL and any associated implementation plan (See Section I). Trades will not be allowed that would cause delay of TMDL implementation, or would allow the combined point source and nonpoint source loadings to exceed the cap established by a TMDL.<sup>18</sup>

## **B. Institutional Framework and Structure<sup>19</sup>**

DEP will be responsible for oversight and management of the Pennsylvania trading program, including responsibility for policy decisions on issues such as eligibility, credit certification, verification, compliance monitoring and enforcement. Individual trading projects must be approved by DEP. DEP will consult with EPA throughout development and implementation of Pennsylvania's trading program, in order to help facilitate alignment with the CWA.<sup>20</sup>

Specific activities may be carried out by entities approved by the Department. Examples of these types of activities include:<sup>21</sup>

- Matching buyers to sellers
- Identifying, verifying, and prioritizing trading partners
- Registering and tracking the generation and use of credits

Trading parties and stakeholders are encouraged to consult with DEP throughout development of trading programs to facilitate alignment with the CWA and the Clean Streams Law.

## Alignment With State Watershed Programs<sup>22</sup>

DEP will align provisions for water quality trading with the State's core water quality and watershed-based programs. This may be accomplished, for example, by including provisions for trading in the continuing planning process, watershed plans, water quality standards, and by incorporating provisions for trading into TMDLs and NPDES permits.

1. *Incorporating Provisions For Trading Into Permits.* In some cases, specific trades may be identified in NPDES permits, including requirements related to the control of nonpoint

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<sup>18</sup> EPA Policy III.E.3

<sup>19</sup> This section conforms to, in part, CBP Guidelines #12 and #13

<sup>20</sup> EPA Final, Sec. III.H

<sup>21</sup> This section conforms, in part, to CBP Guideline #15. More detail could be addressed in a future technical document.

<sup>22</sup> EPA Policy III F Para 1.

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sources where appropriate. DEP also will consider other approaches for incorporating provisions for trading into NPDES permits:

- i) General conditions in a permit that authorize trading and describe appropriate conditions and restrictions for trading to occur,
- ii) The use of variable permit limits that may be adjusted up or down based on the quantity of credits generated or used;
- iii) The use of alternate permit limits or conditions that establish restrictions on the amount of a point source's pollution reduction obligation that may be achieved by the use of credits if trading occurs
- iv) Watershed general permits, where appropriate, to establish pollutant-specific limitations for a group of sources in the same or similar categories to achieve net pollutant reductions or water quality goals through trading (watershed permits issued to point sources should include facility specific effluent limitations or other conditions that would apply in the event the pollutant cap established by the watershed permit is exceeded).<sup>23</sup>
- v) Additional local or contractual authorities, depending on the specific types of credits traded, and the choices of watershed stakeholders in conformance with this document.
- vi) General permits issued pursuant to the Clean Streams Law. General permits, or another appropriate mechanism, may be used in conjunction with the NPDES permits to address trading rules and transactions.

2. *Entities not required to obtain permits.* Sources or entities not covered by the state permitting program, or other state regulatory programs, that intend to become involved in trading or banking credits, need to ensure that they are in compliance with any applicable requirements (e.g. zoning requirements) set forth by local, regional or other authorities.

## C. Stakeholder Involvement and Public Information Access<sup>24</sup>

DEP requires public participation at the earliest stages and throughout the development of water quality trading projects to strengthen program effectiveness and credibility.<sup>25</sup> Pennsylvania also commits to involving a broad set of stakeholders in the implementation of this document and the future development of additional supporting documents and statewide trading strategies.<sup>26</sup> This includes providing an opportunity for the public to provide input and comment on proposed types of trades and trading arrangements. It also includes providing timely information about credit generation and use, credit certifications and verifications, and results of credit inspections and water quality monitoring.<sup>27</sup>

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<sup>23</sup> EPA Policy III.F.2

<sup>24</sup> CBP Guideline #35

<sup>25</sup> EPA Sec II.F.3

<sup>26</sup> CBP Principle # 8

<sup>27</sup> EPA Policy, Sec. II.F.3

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One avenue for public notice and comment is the permit process.<sup>28</sup> Where trading is proposed or anticipated, DEP and permittees will ensure that the permit and fact sheets include description of how trading baselines and other conditions were established and how trading is consistent with water quality standards. If a permit generally or conditionally authorizes trading and the public has had an opportunity to comment during the permit process, individual trades will not require a permit modification. DEP encourages and will help facilitate involving stakeholders and the public in trading initiatives as early as practicable before the public notice and comment period to help build understanding and trust in the process and results.<sup>29</sup>

Pennsylvania believes that a clear and transparent process and presentation of results is key to establishing and maintaining credibility for any trading project. The state encourages watershed trading projects to use electronic and web-based systems to support tracking and publicizing credit postings (e.g., offers to buy and sell), trade and bank transactions, and report progress and performance. DEP will be investigating the various types of systems that can support trading projects and may make investments in pilots or prototypes to help ensure that information (such as quantity of credits generated and used on a watershed basis, market prices where available, and delineations of watershed and trading boundaries) is well managed and readily accessible.<sup>30</sup>

## D. Who May Trade

### General

Any entity may create, purchase, retire or otherwise use credits for the purpose of securing long-term improvements in water quality,<sup>31</sup> subject to the provisions of this document, state, federal and local laws, and related technical guidance that DEP may publish. Credits may be applied toward a regulatory requirement, applied toward a voluntary commitment, banked for later use, or may be permanently retired. Credits may be bought or sold, or exchanged under a non-monetary arrangement, including donations to a source or third party.<sup>32</sup>

DEP will consider the role of compliance history in determining source eligibility to participate in trading.<sup>33</sup> Trading parties must be in substantial compliance with all local, state, and federal environmental laws, regulations, and programs as applicable.<sup>34</sup>

Any source receiving state or Federal funds to achieve nutrient reductions through the development or installation of any nutrient reduction equipment, technology, or structural

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<sup>28</sup> EPA Final, Sec.III.F.3.

<sup>29</sup> EPA Final, sec. III.F.3

<sup>30</sup> EPA Final, Sec. III.G.6

<sup>31</sup> EPA Final, Sec II.G.

<sup>32</sup> CBP Guideline #6

<sup>33</sup> EPA Policy III.G.5 para 3

<sup>34</sup> CBP Principle # 7.

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BMP cannot buy credits to achieve those reductions. If state or Federal funds are used to cost share nutrient controls that generate credits, only the portion of those credits not paid for by the state or Federal cost share are available for trading.<sup>35</sup>

For purposes of determining trading eligibility and applying appropriate conditions, Pennsylvania categorizes trading participants under one of four groups: point sources; indirect dischargers to point sources; nonpoint sources; and third parties not subject to CWA or Clean Streams Law provisions.<sup>36</sup>

## **Direct Dischargers Covered By CWA Sections 402 and 404**

Sources and activities that are required to obtain a state or federal permit pursuant to Sections 402 or 404 of the CWA, and/or pursuant to Pennsylvania's Clean Streams Law must do so to participate in a trade or trading program.<sup>37</sup>

Point sources may create credits, as defined and provided for under this document, and trade them to another regulated or unregulated party, may bank credits for their own future use, may sell credits to a third party, or may permanently retire credits.

Point sources may obtain credits as a means of complying with water quality based permit requirements. Point sources may not use credits to comply with existing technology-based effluent limitations except as expressly authorized by federal regulations. Existing technology-based effluent guidelines for the iron and steel industry allow intra-plant trading of conventional and toxic pollutants between outfalls under certain circumstances (40 CFR 420.03). If EPA includes provisions for trading in the development of new and revised technology-based effluent guidelines and other regulations to achieve technology-based requirements, reduce implementation costs and increase environmental benefits, DEP will consider adopting these provisions under this document.<sup>38</sup>

## **Intra-Plant Trading**

A single facility covered by a NPDES permit may conduct intra-plant trading that involves the generation and use of credits between multiple outfalls that discharge to the same receiving water.<sup>39</sup>

## **Industrial Users Subject to a Publicly Owned Treatment Work Pretreatment Program**

Under EPA's Water Quality Trading policy, a municipality or regional sewerage authority may develop and implement programs allowing trading among industrial users that are

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<sup>35</sup> CBP Guideline #7.

<sup>36</sup> This statement and proceeding language under this section is consistent with CBP Guideline # 4: consideration given to all potential point and nonpoint sources to the extent allowed under current local, state, and federal programs.

<sup>37</sup> EPA Policy III.F.1.

<sup>38</sup> EPA final policy section III.E.4.

<sup>39</sup> EPA Final Policy III.E.6 .

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consistent with the pretreatment regulatory requirements of 40 CFR Part 403 and the POTW's NPDES permit.<sup>40</sup> Publicly owned treatment plants or industrial users interested in this type of trading should contact DEP for a referral to EPA Region III, since DEP does not have delegation over the Pretreatment Program.

## **Stormwater Sources**

All nonagricultural nonpoint source storm water systems governed by a state and/or Federal storm water permit(s) are eligible to generate measurable and certified credits for those reductions that exceed regulatory requirements. For those storm water systems not governed by permit, each must have comparable requirements (to permitted systems) prior to the generation of nutrient reduction credits.<sup>41</sup>

## **Nonpoint Sources**

Nonpoint sources may generate credits for trading provided they meet the minimum requirements for installing, operating, and maintaining best management practices (BMPs) for their source category or land use. Nonpoint sources may obtain credits as a means of complying with voluntary or water quality based permit requirements, as applicable.

Under certain circumstances, nonpoint sources also may have agreed to voluntary commitments for pollutant loading reductions or actions intended to produce water quality improvements. In these situations, nonpoint sources selling credits must first meet their voluntary obligation before participating in trading.

All agricultural nonpoint sources seeking to generate credits must be following an approved Nutrient Management Plan to be eligible to participate in trading.<sup>42</sup> All agricultural BMPs must meet NRCS standards for design, installation, operation and maintenance, Pennsylvania requirements including the PA Nutrient Management Act, CAFO permits and the PA Manure Management Manual, and be part of a Conservation Plan to be considered creditable.<sup>43</sup>

## **Other Parties**

Entities that are not covered by the CWA or Pennsylvania's Clean Streams Law may participate in trading, subject to any other state, local, or private regulation or agreement that covers their land use activities.

## **E. Where Trading May Occur**

All water quality trading shall occur within a defined watershed, a defined area for which a TMDL has been approved, or other DEP-approved areas resulting from commitments such as

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<sup>40</sup> EPA Final Policy III.G.5 slightly amended.

<sup>41</sup> CBP Guideline #10.

<sup>42</sup> CBP Guideline # 8.

<sup>43</sup> CBP Guideline # 9.

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the Chesapeake Bay Agreement. Establishing trading areas that coincide with watershed or TMDL boundary results in trades that affect the same water body or stream segment and helps ensure that water quality standards are maintained or achieved throughout the trading area and contiguous waters.<sup>44</sup> The proposed trading area must be consistent with the requirements and guidance in Section I of this document, *Trading Baselines for Credit Creation and Application*.

## F. What May be Traded

DEP supports trading that involves nutrients (total phosphorus and total nitrogen) or sediments.<sup>45</sup>

DEP also recognizes that trading of pollutants other than nutrients or sediments has the potential to improve water quality and achieve ancillary environmental benefits if trades and trading programs are properly designed. For example, DEP is interested in the concept of cross-pollutant trading for oxygen-related pollutants where adequate information exists to establish and correlate impacts on water quality. Reducing upstream nutrient levels to offset a downstream biochemical oxygen demand or to improve a depressed in-stream dissolved oxygen level are examples of cross-pollutant trading.<sup>46</sup> DEP encourages the exploration of the development of other types of trading projects where such trading achieves a net water quality or environmental benefit, does not cause adverse localized impacts and where it can be demonstrated that the trade(s) will be consistent with other elements of this document.<sup>47</sup> Trades involving credits other than nutrients and sediment and cross-pollutant trading will be reviewed on a case-by-case basis to ensure consistency with Pennsylvania water quality standards.

DEP does not currently support trading of pollutants considered to be persistent bioaccumulative toxics (PBTs).<sup>48</sup>

Some situations present unique challenges, such as waterbodies impaired by abandoned mine drainage (AMD), where trading concepts can be applied, but may involve concepts outside the scope of this document. DEP recognizes that those types of approaches would require guidance tailored to the situation, and encourages stakeholders with potential projects of this sort to contact DEP to discuss the potential applicability of trading.

## G. Unit of Trade

Trading projects or proposals must specify a clearly defined unit of trade. Pollutant specific credits are examples of tradable units for water quality trading. These may be expressed in

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<sup>44</sup> EPA Sec. III.B

<sup>45</sup> EPA Policy Section III.C and CBP Guideline #3

<sup>46</sup> EPA Final Policy, III C

<sup>47</sup> EPA Policy Sec. III.C

<sup>48</sup> EPA Final, Sec. III.C.

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rates or mass per unit time as appropriate to be consistent with the time periods that are used to determine compliance with NPDES permit limitations or other requirements.<sup>49</sup>

A mass-based credit (e.g. pounds) will generally be most appropriate, especially where mass-based loading targets or caps have been established by an individual permit, TMDL, the Chesapeake Bay Agreement or through a voluntary cooperative planning process. For cross-pollutant trading, other approaches to defining credits may be more appropriate to adequately establish the relationship between the actions intended to improve water quality, environmental benefits, and fulfillment of any control or restoration requirements.

## H. Credit Calculations

Credit calculations must properly account for applicable trading ratios (Refer to sub-section "Trading Ratios"), operational life of the control, BMP or water quality improvement project, and any changes in efficiencies over the credit life.

Credits should be generated before or during the same period they are used to comply with a monthly, seasonal or annual limitation or requirement specified in an NPDES permit. Credits may be generated as long as the pollution controls or management practices are functioning as expected.<sup>50</sup>

Where trading involves nonpoint sources, DEP will adopt methods to account for the greater uncertainty in estimates of nonpoint source loads and reductions. (Greater uncertainty in nonpoint source estimates is due to several factors including, but not limited to: variability in precipitation, variable performance of land management practices, time lag between implementation of some practices and full performance, and the effect of soils, cover and slope on pollutant load delivery to receiving waters.) Methods will include options such as: monitoring to verify load reductions, the use of greater than 1:1 trading ratios between nonpoint and point sources, using demonstrated performance values or conservative assumptions in estimating the effectiveness of nonpoint source management practices, using site- or trade-specific discount factors, and retiring a percentage of nonpoint source reductions for each transaction or a predetermined number of credits.<sup>51</sup>

DEP may elect to establish a reserve pool of credits that would be available to compensate for unanticipated shortfalls in the quantity of credits that are actually generated.

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<sup>49</sup> EPA Final, Sec. III.G.2.

<sup>50</sup> EPA Policy Sec. III.G.3

<sup>51</sup> EPA Policy Section III.G.4

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## Trading Ratios<sup>52</sup>

When calculating credits, trading ratios need to be considered and used as appropriate to help ensure that trading provides the desired minimum level of pollutant reductions or other water quality benefits. Pennsylvania recognizes four types of trading ratios.

- a) **Uncertainty Ratios** are intended to account for variation in the expected reliability and efficiency of the source or type of reduction being applied toward credit for another. They are calibrated to create a margin of safety or otherwise attempt to ensure that the credited practice provides a minimum level of reductions, even if actual reduction efficiencies and units removed are on the low end of an expected range.
- b) **Delivery Ratios** apply discount factors to compensate for a pollutant's travel over land or in water (or both) and may be applied to point, as well as, nonpoint sources. Delivery ratios generally account for attenuation (i.e., the rate at which nutrients are reduced through natural processes, such as hydrolysis, oxidation, and biodegradation, on their way through tributaries to the mainstem of the water body). The ratio varies depending on the location of the source from the mainstem. The general idea is that the greater the distance the pollutant has to travel, the greater the pollutant loss will be. This ratio would work to equalize a trade between a source high in the tributary and one near the mainstem. This ratio is also often termed a "location ratio."<sup>53</sup>
- c) **Retirement Ratios** are applied to implement policy-driven or programmatic decisions to require that buyers or sellers donate part of all credit purchases or sales to the state or some other entity that will not apply the credits to offset loadings above its cap. For example, a 10% credit retirement requirement results in a 1.1 to 1 retirement ratio.
- d) **Special Needs Ratios** would account for issues not addressed in other trading ratios; for example, sensitive waters or areas needing additional protection.

## **I. Trading Baselines for Credit Creation and Application**<sup>54</sup><sup>55</sup>

It is necessary to identify baseline responsibilities for parties involved in trading to determine what actions are creditable and what responsibilities credits may be used to offset or fulfill.

The baselines must be derived from and be consistent with water quality standards,<sup>56</sup> TMDLs, and voluntary watershed management commitments, as applicable.

Generally, credits may be created when environmental performance levels are greater than that required by state or local regulation, or another legally-binding agreement.

As detailed below, a baseline may be expressed as a pollutant loading cap, as under a TMDL, or another type of loading target. In these cases, credits may be created when pollutant loadings are maintained at levels below the baseline. For individual sources, baselines can be

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<sup>52</sup> This section conforms to CBP Guideline #14

<sup>53</sup> CBP Nutrient Trading Fundamental Principles and Guidelines, Appendix D

<sup>54</sup> Incorporates language from EPA Policy Sec. III.D

<sup>55</sup> This section is consistent with Guideline #2, which is also reflected in II. General A. Water Quality Benefits.

<sup>56</sup> EPA Policy III.D.

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designated discharge levels. A baseline also may be expressed as a minimum performance standard or set of practices (that also may be defined by size or number of BMPs or other projects). In these cases, credits may be created when actions are taken that provide water quality benefits or other watershed improvements that go beyond the baseline responsibility. In all cases, creditable actions are those that provide a surplus benefit that can be used or traded. Parties may then apply credits to offset pollutant loadings above their baseline or to otherwise satisfy unmet obligations.

A waterbody will fall into one of three categories for purposes of determining baselines for trading: (1) water quality standards are currently met and designated uses are attained (“Fully Supporting”); (2) some or all of the trading area is scheduled for a TMDL that has not yet been developed (“Pre-TMDL”); or (3) a TMDL is in effect for some or all of the trading area (“TMDL”).

## **Pre-TMDL Waterbodies and Fully Supporting Waterbodies**

Where water quality (1) fully supports designated uses; or (2) is impaired, but a TMDL has not yet been established:

- The baseline for point sources should be established by
  - the current permit water quality based effluent limitation,
  - a quantified performance requirement, or
  - or management practice derived from water quality standards
- The baseline for nonpoint sources should be the level of pollutant load associated with existing land uses and management practices that comply with applicable state, local, or tribal regulations.<sup>57</sup>

Section A of this document contains additional related information related to this topic.

## **TMDL Waterbodies**

Where Pennsylvania has developed a TMDL and it has been approved by EPA:

- The baseline for point sources are the applicable point source waste load allocations; and
- The baseline for nonpoint sources are the applicable nonpoint source load allocations.<sup>58</sup>

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<sup>57</sup> EPA Final Policy, Sec. III.D

<sup>58</sup> EPA Final Policy, Sec. III.D.

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## J. Accountability and Compliance with Trading Agreements<sup>59</sup>

Trading project documents must assign and clearly describe responsibilities specific to trading and mechanisms must be in place to oversee and enforce compliance with terms and conditions of credit exchanges. As appropriate, Pennsylvania and trading participants will rely on existing mechanisms, including but not limited to: NPDES permits, general permits, TMDL implementation plans, watershed management plans, and other multi-jurisdictional agreements or multi-agency memoranda of agreement. It may be necessary to revise or supplement these documents and procedures to establish the proper level of accountability with respect to trading.

### Point Source Participants

The NPDES program administered by the Pennsylvania DEP will be the mechanism that provides accountability, measures compliance, and enforcement authority for point sources participating in trades and trading projects. This program includes adequate monitoring, record-keeping, reporting, inspection and audit provisions, public comment opportunity, and oversight authority to support trading.<sup>60 61</sup>

Pennsylvania will develop procedures to account for the generation and use of credits in NPDES permits and discharge monitoring reporting forms. These documents and procedures may be supplemented or integrated with other mechanisms as agreed to by trading sponsors and participants at the watershed level.

Pennsylvania supports several flexible approaches for incorporating provisions for trading into NPDES permits issued to point sources that trade. At minimum, credit purchases, sales, and other exchanges will be reflected in NPDES or general permits for those point sources that are involved in a trade. In some cases, specific trades may be identified in NPDES permits, including nonpoint source requirements where appropriate. In other cases, the NPDES permit may authorize and contain provisions for trading to occur.<sup>62</sup>

DEP will consider the following approaches for incorporating trading into point source NPDES permits:<sup>63</sup>

- a) General conditions that authorize trading and describe appropriate conditions and restrictions for trading to occur;<sup>64</sup>
- b) Variable permit limits that may be adjusted up or down based on the quantity of credits generated or used;

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<sup>59</sup> This section conforms to CBP Guideline #12

<sup>60</sup> EPA Policy Sec. III. F.4

<sup>61</sup> Incorporates CBP Guidelines #21,22, 26, and part of 16, part of 25, part of 27, and part of 28.

<sup>62</sup> EPA Policy Sec. III.F.2.

<sup>63</sup> EPA Policy Sec. III.F.2.

<sup>64</sup> EPA Final Sec. III.F.2.

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- c) Alternate permit limits or conditions that establish restrictions on the amount of a point source's pollution reduction obligation that can be achieved by the use of credits if trading occurs; and/or
- d) Watershed general permits under Sections 121(b) and 119(c)(1) of the CWA, where appropriate, to establish pollutant-specific limitations for a group of sources in the same or similar categories to achieve net pollutant reductions and water quality goals through trading.

### **Nonpoint Source Participants and Third Party Participants**

DEP will consider options, such as use of a contract, for credit generation and trades that involve nonpoint sources and/or third-parties.<sup>65</sup> If contracts are utilized, elements of the Department's regulatory program, such as public participation, will be incorporated.

DEP will consider the following approaches for establishing accountability and enforceability for nonpoint sources and third parties (i.e., non-sources) participating in trading, provided they are in writing and implemented so that they are legally binding and subject to administrative, civil, and/or criminal adjudication:

- a) Performance agreements and bonds
- b) Bilateral or multi-party contracts
- c) Memoranda of Agreement or Understanding
- d) General Permits issued pursuant to PA Clean Streams Law
- e) Watershed general permits under Sections 121(b) and 119(c)(1) of the CWA, where appropriate, to establish pollutant-specific limitations for a group of sources in the same or similar categories to achieve net pollutant reductions and water quality goals through trading.

### ***Additional Considerations***

A combination of record keeping, monitoring, reporting and inspections, and compliance audits will be conducted frequently enough to ensure that a high level of compliance is maintained across any project, and for individual participants. Periodic accounting and reconciliation periods should be established for tracking, evaluation, and compliance purposes (see also under Section L.) It may be necessary to establish enhanced enforcement provisions for failure to generate the quantity of credits that are traded.<sup>66</sup>

DEP will include provisions to address situations where nonpoint source controls and management practices that are implemented to generate credits fail due to extreme weather conditions or other circumstances.<sup>67</sup>

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<sup>65</sup> CBP Guideline #25

<sup>66</sup> EPA Policy Sec. III.G.5.

<sup>67</sup> EPA Policy Sec. III.G.5.

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At a minimum, the following will be provided for all land-based credits:

- All controls must be inspected to ensure the control is properly sited, the materials and plans satisfy established quality specifications, and the installation job meets performance standards.<sup>68</sup>
- All controls must undergo an annual on-site assessment by a qualified inspector to ensure proper functionality (e.g., look for signs of sedimentation and erosion to identify inefficient BMPs). In addition, the owner must allow right of entry by the state or its designated agent. Pennsylvania may use scheduled spot check inspections to supplement scheduled random inspections.<sup>69</sup>
- Annual account balancing periods should be used based upon seasonal monitoring, to the extent that seasonal differences are a factor in credit performance.<sup>70</sup>
- Mechanisms must be in place to calculate the credits or portions of credits eligible for trading.<sup>71</sup>

## **K. Banking**

Banking is a system where credits are stored for possible future use or sale (trade). Banked credits that have received DEP approval can be used in a trading project at a future time when the discharger needs them, can be traded, or can be retired.

Activities that could generate credits (such as BMP installation) can be submitted to DEP as part of a request for inclusion in a banking system, regardless whether the activities occurred within the area of a currently defined trading project. Details on information that needs to be included in a submittal will be included in guidance. Other details on banking, such as lifetime of a banked credit, will also be addressed in guidance.

## **L. Assessing Progress: Tracking and Reporting<sup>72 73</sup>**

Watershed trading sponsors and participants must conduct annual assessments of their project's environmental effectiveness for purposes of demonstrating progress, informing and educating the public, and developing a basis to make project revisions as needed.

DEP (or a delegated authority) will track the actions of trading partners, compliance with trade agreements, and any enforcement action taken.<sup>74</sup> The results of such individual and statewide program evaluations will be made available to the public, possibly in the form of an annual report. A watershed trading project and/or the state will provide an opportunity for comment on changes to a project as necessary to ensure the water quality standards are

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<sup>68</sup> CBP Guideline #17

<sup>69</sup> CBP Guideline #18

<sup>70</sup> CBP Guideline #23

<sup>71</sup> CBP Guideline #24

<sup>72</sup> This section includes all language from EPA Policy [EPA Final Sec. III.G.6 and Sec. III.G.7.] as tailored.

<sup>73</sup> This section also conforms to CBP Guidelines # 12, 19, 27, 28, 29, 30, 31, 32.

<sup>74</sup> CBP Guideline #30

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achieved, trading does not result in localized impairment of existing or designated uses and that the project achieves the water quality objectives it was designed to meet.<sup>75</sup>

Pennsylvania will develop standardized and recommended protocols for collecting, evaluating, and disseminating trading project activities and results. DEP will collect this information and materials, or possibly require it be posted to a web-based trading registry to be developed. The registry will provide the public with access to information about state-level and watershed-level trading actions. The registry also may be designed to facilitate the operation of credit markets, including posting buy and sell offers, and registering completed transactions, for example.

As possible given restraints related to resources and other variables, DEP will perform ambient monitoring and modeling to assess the effect of trading activities in achieving pollutant reduction goals.<sup>76</sup> DEP will also search for additional sources of funding for studies to quantify actual nonpoint source load reductions, validate nonpoint source pollutant removal efficiencies and determine whether the anticipated water quality objectives have been achieved. Trading project sponsors and participants are encouraged to collaborate with the state in these activities, perform their own monitoring and studies as necessary to support their projects, and look for opportunities to collaborate with local, state, and federal agencies to leverage multiple funding sources.

Pennsylvania also is interested in assessing the economic performance of trading projects in the state. DEP will request sponsors and participants provide data relating to the number and type of trades, the price paid for credits, transaction costs, and project administration costs as part of the project evaluation process.<sup>77</sup>

## **OTHER REFERENCES:**

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<sup>75</sup> EPA Final Policy III.G.7

<sup>76</sup> CBP Guideline #27. In addition to these activities, DEP may undertake additional activities as suggested by Guideline #20.

<sup>77</sup> EPA Final Policy III.G.7