

Water Quality Trading Scenario: Point Source Credit Exchange

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Water Quality Trading Scenario: Point Source Credit Exchange

This water quality trading scenario focuses on technical and programmatic issues related to water quality trading through a point source credit exchange, illustrated in Figure 1. Point sources that over control their discharges generate the credits in the exchange, and a separate entity maintains the credit exchange. The credit exchange would likely have to be either operated by or approved and overseen by a state regulatory agency. Issues addressed under this scenario include the following:

- Credit exchange administration
- Trade agreements
- Components of a National Pollutant Discharge Elimination System (NPDES) permit
 - Permit cover page
 - Effluent limits
 - Monitoring
 - Reporting requirements
 - Special conditions

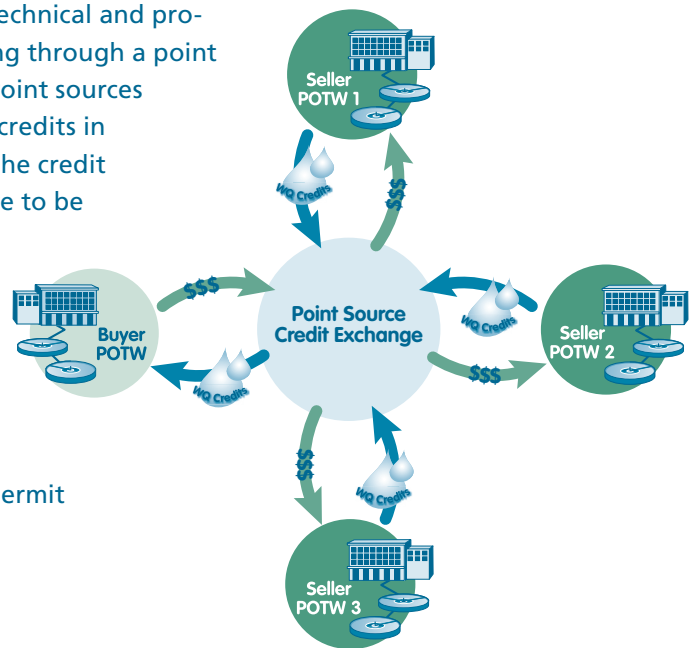


Figure 1. Point source credit exchange.

A hypothetical example (shown in highlighted boxes) is presented throughout this scenario to illustrate how NPDES permit writers might work with credit buyers and sellers to assist in trading and ensure each facility's NPDES permit contains the appropriate limits, requirements, and other conditions. Keep in mind that there are a range of options for incorporating trading provisions into a NPDES permit. The hypothetical example discussed throughout this scenario illustrates just one of the many options a NPDES permit writer might use.

Credit Exchange Administration

A variety of entities can establish and administer credit exchanges, including state agencies, local governments, nonprofit nongovernmental entities, soil and water conservation districts, private entities or other third parties. Management responsibilities for a credit exchange will vary according to the watershed and needs of the trading partners. To address the potential inadequacy of generated credits (i.e., treatment control failure), credit exchanges should consider reserving credits that would be available to credit purchasers if the primary credit source is insufficient. Entities administering credit exchanges can reserve credits in a number of ways. One option is for the credit exchange to *overbuy* available credits from point sources approved to generate credits. Another option is to require point source dischargers that want the ability to purchase credits from the credit exchange—now or in the future—to pay a user fee to the credit exchange that will in turn finance additional point source treatment controls approved to generate credits.

Trade Agreements

Typically, the terms that govern a trading program will be developed outside the NPDES permit process and can be incorporated or reflected in the permit (see [Appendix C](#)). The U.S. Environmental Protection Agency’s (EPA) *Water Quality Trading Policy* (Trading Policy) describes several mechanisms for implementing trading through NPDES permits (see [Appendix B](#)). NPDES permits authorizing water quality trading should reference any existing trade agreement in the permit and fact sheet. The permit writer may also incorporate specific provisions of the agreement as appropriate (e.g., shared responsibilities for conducting ambient monitoring) into the permit. All trade agreements referenced in NPDES fact sheets and permits should meet certain minimum standards to help ensure the trades authorized by the permit are consistent with water quality standards. At a minimum, the trade agreement should be a written agreement and signed and dated by authorized representatives of all trading partners. Verbal trade agreements should not be referenced in NPDES permits. The written trade agreement should contain sufficient detail to allow the permitting authority to determine with some degree of certainty that the terms of the agreement will result in loading reductions and generation of sufficient credits to satisfy water quality requirements. If there is no formal, outside trade agreement, trading can still occur; however, the permit writer will need to more explicitly describe the trading program in the fact sheet and authorize specific aspects of the trading program as permit conditions. Trading partners can specify the details pertaining to the negotiated terms of the trade (e.g., credit price, payment schedule, consequences for failure to fulfill negotiated terms) in a separate, written and signed contract.

For a credit exchange to succeed, adequate credits should be available to meet the demand of the purchasers; therefore, a trade agreement could contractually obligate the credit generators to create a certain number of credits to participate in the program. Likewise, the administrator of the credit exchange might want to ensure that point sources purchase a certain number of credits and include this obligation in an agreement, as well. The obligations could be for a defined period, such as one permit term. Penalties for not meeting the terms of the trade agreement should be clearly specified in the agreement and incorporated by reference into a NPDES permit.

Flowing River Example: Trade Agreements

■ *What You Need to Know...*

Pollutant: Total Phosphorus

Driver: Newly approved TMDL^a for Total Phosphorus for the Flowing River Watershed

Point Source Credit Exchange: *Flowing River Watershed Phosphorus Credit Exchange (administered by the state)*

Participating Facilities: *Chuck’s Potash Company, Green and Go Fertilizers, Shag Rug, Inc., Troyville POTW^b, Alpha Limited*

Notes: ^a TMDL = Total maximum daily load; ^b POTW = publicly owned treatment works

Location: All facilities are less than a mile apart from each other along the Flowing River.

Flowing River Example: Trade Agreements *(continued)*

Applicable Trade Ratios: None. In this case, it is not necessary to apply a delivery ratio because of the close proximity of the sources to each other, nor an equivalency ratio because the same pollutant form is being traded, nor an uncertainty ratio because both parties can accurately monitor end-of-pipe loads.

The state and stakeholders in the Flowing River watershed have cooperatively participated in the development of the Flowing River Watershed Phosphorus Credit Exchange to meet the point source facilities' wasteload allocation (WLA) under the approved phosphorus TMDL. To facilitate trading, the Flowing River Watershed Phosphorus Credit Exchange drafted a trade agreement that buyers and sellers must sign to participate. The basic terms of the trade agreement are as follows:

- The trade agreement establishes a contractual obligation between the credit buyers and sellers to participate for a period of 5 years.
- Participants that sign the trade agreement acknowledge that the facility's phosphorus discharges will be covered under a separate phosphorus overlay permit for all participants in the Flowing River Watershed Phosphorus Credit Exchange, as opposed to the facility's existing NPDES permit. The overlay permit is scheduled to be completed and become effective in one year.
- Trades occur annually at the end of the TMDL *season* (June 1–September 30) on the basis of the seasonal mass loading of total phosphorus (TP) compared to seasonal phosphorus discharge limits for each facility.
- Monitoring and flow data is to be submitted to the Exchange quarterly by the end of the month following the quarter (April, July, October, and January).
- Before reconciling trade requirements, the Flowing River Watershed Phosphorus Credit Exchange will determine the value of a phosphorus credit on the basis of capital costs of TP removal, as well as operation and maintenance costs of pollutant controls.
- Each year, the Flowing River Watershed Phosphorus Credit Exchange will reconcile credit sales and purchases by March of the following calendar year.
- Each participant in the Flowing River Watershed Phosphorus Credit Exchange will have a baseline. Buyers will also have minimum control levels, and sellers will also have trading limits (baseline – credits sold) included in an appendix to the trade agreement. Facilities performing better than their baselines will receive payment from the Flowing River Watershed Phosphorus Credit Exchange for phosphorus credits generated, on the basis of annual price. Facilities that do not achieve their baseline, while meeting their minimum control levels, will owe payment to the Flowing River Watershed Phosphorus Credit Exchange for phosphorus credits equal to the amount discharged above their baseline.
- Each facility will be responsible for conducting weekly monitoring and monthly reporting to the permitting authority as required under the overlay permit.

The Flowing River Watershed Phosphorus Credit Exchange will purchase excess phosphorus credits to ensure that sellers receive compensation for their phosphorus credits. However, the Flowing River Watershed Phosphorus Credit Exchange will not hold excess credits or make these credits available for future purchase.

Flowing River Example: Trade Agreements *(continued)*

The NPDES permit writer for the facilities participating in the Flowing River Watershed Phosphorus Credit Exchange receives a written copy of the trade agreement that is signed and dated by authorized representatives of each participating facility. Although the NPDES permit writer is already familiar with the terms of the trade agreement because of participating in the development of the Flowing River Watershed Phosphorus Credit Exchange, the written and signed trade agreement indicates which facilities are planning to participate and should have coverage under the overlay permit.

The permit writer will incorporate monitoring and reporting requirements necessary to determine compliance with the annual phosphorus discharge limits for each facility and facilitate trading through the Flowing River Watershed Phosphorus Credit Exchange. The NPDES permit writer will also specify compliance conditions, including the need to purchase phosphorus credits in a specified amount at a specified time to achieve the baseline, that are consistent with the terms of the trade agreement. However, the permit would not specify the cost for phosphorus credits or have the ability to name buyers and sellers.

Components of a NPDES Permit

NPDES permits that authorize water quality trading are no different than typical NPDES permits in many respects—they require the same structure, analyses, and justification. All permits have five basic components: (1) cover page; (2) effluent limitations; (3) monitoring and reporting requirements; (4) special conditions; and (5) standard conditions. Standard conditions are the same for all NPDES permits and will not be addressed in this Toolkit. In addition, consistent with Title 40 of the *Code of Federal Regulations* (CFR) section 124.6, all permits are subject to public notice and comment. This provides all interested parties an opportunity to comment on the trading provisions in the permit.

Each NPDES permit is accompanied by a permit fact sheet. The information in these fact sheets is not enforceable. The purpose of the fact sheet is to explain the requirements in the permit to the public. Thus, at a minimum, the fact sheet should explain any trading provisions in the permit. There is a wide variety of options for including trading information in the fact sheet that ranges from explaining the minimum control level (buyer) or trading limit (seller) to including the entire trading program.

There are a variety of issues, however, that may require special consideration when developing a permit incorporating water quality trading. Appendix E provides the permit writer with a list of fundamental questions that should be addressed during the permit development process.

Permit Cover Page

The cover page of a NPDES permit typically contains the name and location of the permittee(s), a statement authorizing the discharge, the specific locations for which a discharge is authorized (including the name of the receiving water), and the effective period of the permit (not to exceed 5 years). If numerous permittees are covered, they can be listed in an appendix or attachment that is referenced on the cover page. A permit incorporating or

referencing a trade agreement can refer to water quality trading on the cover page, but this is not necessary. If the state has issued regulations or policy documents authorizing water quality trading, the permit writer should consider referencing the regulations in the Authority section of the cover page. For example, if trading is considered a water-quality management tool in a state’s Water Quality Management Plan, this may establish authority for integrating trading into NPDES permits and can be referenced on the cover page (Jones 2005).

The cover page may also address the specific pollutants regulated by the permit. For instance, the cover page of an overlay permit for TP may state that the overlay permit addresses only TP and that other parameters are addressed in each facility’s individual permit.

Long Island Sound, Connecticut

Connecticut’s General Permit for Nitrogen Discharges establishes the authority to discharge nitrogen as follows:

(a) Eligible Activities or Discharges

This general permit authorizes the discharge of total nitrogen (TN) from the POTWs listed in Appendix 1 (of the original permit), provided the activities are conducted in accordance with this general permit.

This general permit does not authorize any discharge of water, substance or material into the waters of the state other than the one specified in this section. Any person or municipality that initiates, creates, originates or maintains such a discharge must first apply for and obtain authorization under Section 22a-430 of the General Statutes.

For more information about this trading program, see Appendix A.

Effluent Limitations

Effluent limitations are the primary mechanism for controlling the discharge of pollutants from point sources into receiving waters. When developing a permit, the permitting authority focuses much of its effort on deriving appropriate effluent limitations. As in all NPDES permits, permits that include trading must include any applicable technology-based effluent limitations (TBELs), or the equivalent and, where necessary, water quality-based effluent limitations (WQBELs), that are derived from and comply with all applicable technology and water quality standards. Furthermore, limits must be enforceable, and the process for deriving the limits should be scientifically valid and transparent.

EPA’s Trading Policy does not support trading to meet TBELs unless trading is specifically authorized in the categorical effluent limitation guidelines on which the TBELs are based. Applicable TBELs thus serve as the minimum control level below which the buyer’s treatment levels cannot fall. This section discusses the overarching principles of how to express all applicable effluent limitations in permits for dischargers participating in water quality trades.

Credit Buyers

Permits for credit buyers should include both the baseline, which is the WQBEL that defines the level of discharge the buyer would have to meet through treatment **when not** trading, and a minimum control level that must be achieved through treatment **when** trading. The

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permit should also include the amount of pollutant load to be offset (minimum control level – baseline) through credit purchases when trading. Most often, the applicable TBEL will serve as the minimum control level. A permitting authority can choose to impose a more stringent minimum control level than the TBEL to prevent localized exceedances of water quality standards near the point of discharge but not one that is less stringent than the TBEL. In a NPDES permit fact sheet, the effluent limitations for a credit buyer could be described as follows:

- The Discharger must meet, through treatment or trading, a mass-based effluent limitation for Pollutant A of <insert baseline>. If this effluent limitation is met through trading, the Discharger must purchase credits from authorized Sellers in an amount sufficient to compensate for the discharge of Pollutant A from Outfall 001 in excess of <insert baseline>, but at no time shall the maximum mass discharge of Pollutant A during <insert averaging period> exceed the minimum control level of <insert minimum control level>. Thus, the maximum mass discharge of Pollutant A to be offset through credit purchases is <insert minimum control level – baseline>.

Credit Sellers

When a potential credit seller is able to reduce its discharge below its most stringent applicable effluent limitation (i.e., its baseline), it may generate credits to sell. The quantity of credits that any given seller actually will be able to sell depends on the market for credits, agreements made with buyers, and any treatment requirements placed on potential buyers (i.e., the buyers’ minimum control levels). Because of these factors, it is possible that a discharger will not be able to sell all the credits it generates.

A credit seller’s permit will include both the most stringent effluent limitation that would apply without trading (e.g., baseline) and a trading limit. The seller can choose to what level it will control its pollutant discharge (using technology or best management practices (BMPs) it will implement) and this level becomes its trading limit. The baseline and trading limit could be described in the permit fact sheet as follows:

- Through treatment, the Discharger must meet a mass-based effluent limitation for Pollutant A of <insert baseline>. The Discharger is authorized to further treat its discharge, remove additional loading of Pollutant A, and generate and sell credits to an authorized credit Buyer or Buyers. If the Discharger sells such credits, the <insert averaging period, e.g., average monthly> effluent limitation <insert baseline> no longer applies and the trading limit for Pollutant A at Outfall 001 shall apply instead as follows: Trading Limitation = <insert baseline> – Quantity of Pounds Sold.

The permit must include monitoring and reporting requirements for Pollutant A sufficient to demonstrate that the seller actually has generated the credits it sells and, therefore, is meeting its trading limit.

Aggregate or Individual Limitations

It may be appropriate for permit writers to include aggregate WQBELs that apply to the group of point sources covered under a general or watershed permit. An aggregate effluent limitation typically represents the sum of the pollutant WLAs for all permittees covered by the permit. This allows maximum flexibility for trades among dischargers within the

Flowing River Example: Effluent Limitations

■ What You Need to Know...

Pollutant: Total Phosphorus

Driver: Newly approved TMDL for Total Phosphorus for Flowing River

Exchange Participants:

Chuck's Potash Company

Current Load: 2,000 lbs (total per season)

New QBEL (based on WLA): 8,000 lbs (total per season)

New Treatment Capabilities: Treatment to 4,000 lbs (total per season)

Excess Pounds Reduced: 4,000 lbs (total per season)

Green and Go Fertilizers

Existing Discharge: 2,500 lbs (total per season)

New QBEL (based on WLA): 2,000 lbs (total per season)

Treatment Capabilities: Treatment to 2,500 lbs (total per season)

Pounds Needed: 500 lbs (total per season)

Shag Rug, Inc.

TBEL: 1,800 lbs (total per season)

New QBEL (based on WLA): 1,000 lbs (total per season)

Treatment Capabilities: Treatment to 1,800 lbs (total per season)

Pounds Needed: 800 lbs (total per season)

Troyville POTW

TBEL: 10,000 lbs (total per season)

New QBEL (based on WLA): 8,000 lbs (total per season)

New Treatment Capabilities: Treatment to 4,000 lbs (total per season)

Excess Pounds Reduced: 4,000 lbs (total per season)

Alpha Limited

Existing Discharge: 1,200 lbs (total per season)

New QBEL (based on WLA): 500 lbs (total per season)

Treatment Capabilities: Treatment to 1,200 lbs (total per season)

Pounds Needed: 700 lbs (total per season)

Flowing River Example: Effluent Limitations *(continued)*

Location: All facilities are less than a mile apart from each other along the Flowing River.

Applicable Trade Ratios: None.

To facilitate trading amongst the dischargers, the Flowing River Phosphorus Credit Exchange (Exchange) is designed to facilitate the exchange of credits between point source credit generators and purchasers. The Exchange has developed a trade agreement that outlines how point sources can generate and purchase credits, how to calculate trade ratios, as well as individual responsibilities for meeting effluent limitations. Trades occur once per year at the end of the TMDL *season* (June 1–September 30).

Of the potential participants in the Exchange, only the municipal wastewater treatment facility’s (Troyville POTW) and carpet manufacturer’s (Shag Rug, Inc.) existing permits include TBELs. Both are meeting the TBELs. The state has developed a general watershed-based permit for phosphorus point source dischargers along the Flowing River. The permit authorizes trading and includes the seasonal mass loading WQBELs that are based directly on the WLA requirements of the TMDL.

To comply with its seasonal WQBEL, a permittee may either meet the limitation at the point of discharge through treatment or other pollutant reductions at the facility or, after meeting its minimum control level (i.e., current discharge before the TMDL or applicable TBEL), pay into the Exchange to purchase necessary credits. The facility must treat its discharge to meet its minimum control level to purchase credits from the Exchange.

To be eligible to sell credits to the Exchange, a facility must first treat the discharge to meet its most stringent effluent limitation, which, in this case, is the WQBEL that implements the WLA. In addition, the state has established trading limits for all dischargers entering the Exchange as sellers, and these limitations must be met for the duration of the permit cycle.

Permit Language:

a. Effluent Limitations

1. Seasonal total mass loading effluent limitations applicable to each permittee covered under this permit are set forth in Table 1, which is incorporated herein in its entirety, as part of this general permit.
2. If the permittee participates in the Flowing River Phosphorus Credit Exchange, the permittee’s total annual mass discharge of total phosphorus shall not exceed the Seasonal Mass Loading Limitation (With Trading) outlined in Table 1.
3. If the permittee does not participate in the Flowing River Phosphorus Credit Exchange, the permittee’s total annual mass discharge of total phosphorus shall not exceed the Seasonal Mass Loading WQBEL (Without Trading).
4. A permittee shall be out of compliance with the seasonal discharge limitations of the general permit and subject to enforcement provisions if the facility’s seasonal mass loading of total phosphorus exceeds the applicable discharge limitations outlined in (a) (1) and (2) above.
5. Credits may be generated and used only between June 1–September 30.

Flowing River Example: Effluent Limitations *(continued)*

Table 1. Seasonal mass loading effluent limitations for TP

Discharger	Units	June 1–September 30	
		Seasonal mass loading WQBEL (without trading)	Seasonal mass loading limitation (with trading)
Chuck’s Potash Company	lbs	8,000 (Baseline/WQBEL)	¹
Green and Go Fertilizers	lbs	2,000 (Baseline/WQBEL)	2,500 (Minimum Control Level/ Existing Discharge)
Shag Rug, Inc.	lbs	1,000 (Baseline/WQBEL)	1,800 (Minimum Control Level/TBEL)
Troyville POTW	lbs	8,000 (Baseline/WQBEL)	¹
Alpha Limited	lbs	500 (Baseline/WQBEL)	1,200 (Minimum Control Level/ Existing Discharge)

¹ Trading limit = (WQBEL – pollutant loading reduction necessary to generate quantity of credits sold)

watershed but should be considered only if localized exceedances of water quality standards are not a concern. An aggregate limitation allows individual dischargers to discharge or trade among themselves to any degree as long as the aggregate limitation is met. An aggregate effluent limit may be most appropriate in a trading scenario involving many individual dischargers within a watershed having a large-scale load reduction driver such as a TMDL for the entire waterbody or a percent load reduction requirements for the watershed as a whole. This is functionally equivalent to having a series of individual WQBELs and no trading limits.

EPA does not endorse setting a multisource aggregate limit without also including in the permit individual limits for each source covered. If the group of facilities does not meet its aggregate limit and an individual source does not meet its limit on its own and does not trade to meet it, enforcement action may be taken against this individual source. This approach keeps co-permittees under the general or watershed permit that have met their requirements free from liability when other co-permittees are responsible for the group discharging above the aggregate limit.

Neuse River Basin, North Carolina

The Neuse River Compliance Association (NRCA) general permit has an aggregate total nitrogen (TN) allocation, and each member of the association has an individual allocation. If the NRCA meets the aggregate limit for the year, the NRCA and each permittee are in compliance. If the aggregate limit is exceeded, the NRCA is out of compliance, and any member that exceeds its individual TN limit is also out of compliance and subject to enforcement action. For more information about this trading program, see Appendix A.

Pollutant Form, Units of Measure, and Timing Considerations

The permit should explicitly identify the **pollutant or pollutants being traded**. The permitting authority should ensure that the trading program or agreement and the calculated WQBELs are consistent in terms of the form of the pollutant, units of measure, and timing.

For example, if the pollutant specified in the WQBEL is nitrate-nitrogen, then credits generated under the trade agreement should be for nitrate-nitrogen and not for total Kjeldahl nitrogen (TKN) or some other form. If, on the other hand, the WQBEL is for TN, buyers and sellers should trade TN credits. In this case, a discharger may be required to measure TN. If there are concerns about localized impacts and WQBELs are also specified for a particular form or forms of nitrogen, the discharger may be required to monitor TKN, nitrite, and nitrate (all expressed as N) and then calculate its TN discharge.

Also an **equivalency ratio** may be needed when two sources are trading pollutants such as TN or TP but are actually discharging different forms of nitrogen or phosphorus (e.g., one discharger’s phosphorus discharge is made up primarily of biologically available phosphorus, while its trading partner’s discharge is primarily composed of bound phosphorus). An equivalency ratio may also be needed in cross-pollutant trading of oxygen demanding pollutants (e.g., phosphorus and biochemical oxygen demand (BOD)). In this case, the equivalency ratio would equal the ratio between the two pollutants’ impacts on oxygen demand. The trading program should account for any necessary equivalency ratios with regard to pollutant form or type; the permit writer needs to be aware of the pollutant form or type addressed in the trade agreement to ensure that the permit is consistent.

In addition, consistent **reconciliation periods** are essential in trading between point sources. The credit purchaser’s permit limits for the traded pollutant and the credit seller’s permit limits should have the same units and averaging period. Because both sets of limits are designed to address the same water quality problem, both should use the averaging period and units that make the most sense to address that problem. Consistent units and averaging periods will also simplify reconciliation of credit sales and purchases.

Flowing River Example: Pollutant Form, Units of Measure, and Timing

■ *What You Need to Know...*

Pollutant: Total Phosphorus

Driver: Newly Approved TMDL for Total Phosphorus for the Flowing River Watershed

Point Source Credit Exchange: *Flowing River Watershed Phosphorus Credit Exchange (administered by the state)*

Participating Facilities: *Chuck’s Potash Company, Green and Go Fertilizers, Shag Rug, Inc., Troyville POTW, Alpha Limited*

Location: All facilities are less than a mile apart from each other along the Flowing River.

Applicable Trade Ratios: None.



Flowing River Example: Pollutant Form, Units of Measure, and Timing *(continued)*

Pollutant Form

The TMDL indicates a need for all trading partners to control phosphorus discharges. To meet the new WQBELs for phosphorus, several members of the Exchange will install new treatment technology to reduce loads beyond the 30 percent required by the TMDL and wish to sell the excess reductions in the form of credits to the Exchange. Other members are unable to meet the new WQBELs that will be in the overlay permit and are choosing to purchase phosphorus credits from the Exchange. However, the solubility of the phosphorus impacts the amount available biologically in the waterbody. The more soluble the phosphorus form, the more readily it can impact the waterbody. Therefore, trades between partners must account for the different solubility of various facilities' discharges.

All members of the Exchange have monitored their effluent to determine the solubility of the phosphorus discharged. The monitoring data showed that the solubility of phosphorus discharges were equitable among the dischargers in the Exchange; therefore, no equivalency ratio is necessary.

Units of Measure

The phosphorus WQBELs based on the TMDL WLA are expressed in lbs as seasonal mass loadings to correspond with the units and averaging period in the TMDL. The phosphorus limits in most of the Exchange facilities' existing permits are also expressed in lbs as seasonal mass loadings. The trade agreement also specifies lbs as a seasonal mass loading. Annual trades will be based on seasonal mass loading reductions demonstrated through monitoring.

Timing of Credits

Credits are available beginning at the time of permit issuance. This allows 12 months before permit issuance for the Exchange to gather monitoring data to verify that the seller's technologies are achieving the expected treatment efficiency and will generate credits as expected after accounting for established ratios. These data are necessary to better understand how loading and reduction may vary over time. The general permit reflects these conditions. Trades will occur annually to correspond with seasonal mass-loading effluent limitations. The sellers will be able to continue to generate credits as long as the controls are properly operated and maintained, the facilities are able to demonstrate reductions, and the facilities do not become subject to more stringent requirements that would reduce or eliminate the credits (i.e., newly promulgated effluent guidelines or other more stringent technology-based controls, additional WQBELs to avoid localized exceedances of water quality standards). The ability of the sellers to continue to generate credits will be assessed during the renewal of the individual permits every 5 years.

Anti-backsliding, Antidegradation, and New Discharges Special Considerations

The Trading Policy discusses anti-backsliding and antidegradation and how these provisions can be met through trading.

Anti-backsliding

The term *anti-backsliding* refers to a statutory provision (CWA section 402(o)) that, in general, prohibits the renewal, reissuance, or modification of an existing NPDES permit that contains

WQBELs, permit conditions, or standards that are less stringent than those established in the previous permit (USEPA 1996b). The CWA establishes exceptions to this general anti-backsliding prohibition. EPA has consistently interpreted section 402(o)(1) to allow for less-stringent effluent limitations if either an exception under section 402(o)(2) or, for WQBELs, the requirements of section 303(d)(4) are met (USEPA 1996b). Section 402(o)(2) and 40 CFR 122.44(l) provide exceptions for circumstances such as material and substantial alterations to the facility, new information, events beyond the permittee’s control, and permit modifications under other sections of the CWA. Section 303(d)(4), which applies only to WQBELs, allows a less-stringent WQBEL in a reissued permit when the facility is discharging to a waterbody attaining water quality standards as long as the waterbody continues to attain water quality standards even after the WQBEL is relaxed. In addition, revising the limitation must be consistent with the state’s antidegradation policy. If the discharge is to a waterbody that is not attaining water quality standards, a less-stringent WQBEL is allowed only when the cumulative effect of all revised effluent limitations results in progress towards attainment of water quality standards. For a detailed discussion of the anti-backsliding exceptions, see EPA’s *NPDES Permit Writers’ Manual* (EPA-833-B-96-003). EPA’s Trading Policy states:

EPA believes that the anti-backsliding provisions of Section 303(d)(4) of the CWA will generally be satisfied 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 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.

A permit writer should simply explain in the fact sheet of the permit how the limitations in the permit, after accounting for any trading provisions, are at least as stringent as the limits in the previous permit or, alternatively, how anti-backsliding provisions of the CWA are satisfied.

Antidegradation

As repeated throughout this document, NPDES permits may not facilitate trades that would result in nonattainment of an applicable water quality standard, including the applicable antidegradation provisions of water quality standards. Permitting authorities should ensure that WQBELs developed to facilitate trade agreements accord with antidegradation provisions and that antidegradation reviews are performed when required. Nothing in the Trading Policy per se changes how states apply their antidegradation policies, though states may modify their antidegradation policies to recognize trading.

The Trading Policy states:

*EPA does not believe that trades and trading programs will result in “lower water quality” . . . or that antidegradation review would be required under EPA’s regulations when the trades or trading programs achieve a **no net increase** of the pollutant traded and do not result in any impairment of designated uses.*

Special considerations for antidegradation relative to water quality trading depend on the tier of protection applied to the waterbody as described below.

Tier 1 is the minimum level of protection under antidegradation policies. For Tier 1 waters, the antidegradation policy mandates protection of existing instream uses. Because EPA neither supports trading activities nor allows issuance of permits that violate applicable water quality standards, which should protect existing uses at a minimum, any supported trading activities incorporated into a NPDES permit should not violate antidegradation policies applicable to Tier 1 waters.

Tier 2 protects waters where the existing water quality is higher than required to support aquatic life and recreational uses. Water quality in Tier 2 waters may be lowered (only to the level that would continue to support existing and designated uses) but only if an antidegradation review finds that (1) it is necessary to lower water quality to accommodate important social or economic development, (2) all intergovernmental and public participation provisions have been satisfied, and (3) the highest statutory and regulatory requirements for point sources and BMPs for nonpoint sources have been achieved. The Trading Policy supports trading to maintain high water quality when trading is used to compensate for new or increased discharges. Thus, the Trading Policy supports reductions of existing pollutant loadings to compensate for the new or increased load so that the result is *no lowering of water quality*. A state, in applying its antidegradation policy, may decide to authorize a new or increased discharge to high-quality water and may decide to use trading to completely or partially compensate for that increased load. If the increased load to Tier 2 waters is only partially compensated for by trading, an antidegradation review would be required to address the increased load.

Tier 3 protects the quality of outstanding national resource waters and waters of exceptional recreational or ecological significance. In general, antidegradation policies do not allow any increase in loading to Tier 3 waters that would result in lower water quality. EPA supports trading in Tier 3 waters to maintain water quality.

Monitoring

Permitting authorities may want to consider developing monitoring and reporting requirements to characterize waste streams and receiving waters, evaluate wastewater treatment efficiency, and determine compliance with permit conditions in trade agreements. Monitoring and reporting conditions of a NPDES permit may contain specific requirements for sampling location, sample collection method, monitoring frequencies, analytical methods, recordkeeping, and reporting. If the permit conditions include compliance with provisions in a trade agreement, then the permitting authority should include monitoring, record-keeping and reporting requirements that facilitate compliance evaluations and, where necessary, enforcement actions related to the trading requirements. Discharge monitoring requirements should be consistent with the provisions of the trade agreement in terms of pollutants and forms of pollutants monitored, reporting units, and timing. The permit provisions should ensure that the results of discharge monitoring will be useful to the permittees, the permitting authority, and the general public in determining whether the provisions of the trade agreement are being met.

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Sample Collection and Analysis

The same discharge sampling location used for compliance in any existing NPDES permits should be used for determining compliance with effluent limitations developed for traded parameters. Samples collected as part of a self-monitoring program required by a NPDES permit must be performed in accordance with EPA-approved analytical methods specified in 40 CFR Part 136 (*Guidelines for Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act*) where Part 136 contains methods for the pollutant of concern. Where no Part 136 methods are available, the permit writer should specify which method should be used for compliance monitoring.

Parties Responsible for Monitoring

The trade agreement specifies the types and frequency of monitoring needed as well as the parties responsible for monitoring. The individual facilities are ultimately responsible to ensure that effluent monitoring is completed and reported to the permitting authority. Any enforcement actions for failure to monitor and report will be against the individual facilities. The permitting authority should ensure that sufficient monitoring is required to allow permittees, agency compliance personnel, and the public to gauge whether dischargers are meeting their individual effluent limitations and requirements under the trade agreement.

Discharge monitoring under a multiple facility permit would be required of all individual dischargers and should be listed in the permit. If the permit is an overlay permit used to incorporate water quality trading for specific pollutants, the permitting authority may establish certain monitoring requirements, such as monitoring location, by reference to the facility’s individual NPDES permit for consistency. Alternatively, the permit could specifically list the monitoring location and requirements for each permittee or co-permittee.

The permitting authority may consider establishing more frequent monitoring for facilities with higher design flows than those with lower design flows. Monitoring and reporting requirements in a multiple facility permit, such as a watershed-based permit, would be a combination of individual and watershed-wide requirements as described below.

Ambient Monitoring

Ambient monitoring is one way to show whether a trade agreement meets or improves water quality. In addition to traditional discharge monitoring requirements, ambient water quality monitoring may be appropriate at strategic locations to ensure that the trade is not creating localized exceedances of water quality standards and to document the performance of the overall trading program. Permits with mixing zones may include monitoring requirements as appropriate to ensure that water quality criteria are not exceeded at the edge of the applicable mixing zone.

General or watershed-based permits may establish a comprehensive, watershed monitoring program. For example, to fulfill monitoring requirements that are applied to multiple dischargers, permittees could establish a monitoring consortium to collect ambient water quality data that supplements end-of-pipe monitoring data required by the permit. Through this group-wide monitoring consortium, permittees could generate data to use in watershed assessments.



Flowing River Example: Monitoring

■ What You Need to Know...

Pollutant: Total Phosphorus

Driver: Newly Approved TMDL for Total Phosphorus for the Flowing River Watershed

Point Source Credit Exchange: *Flowing River Watershed Phosphorus Credit Exchange (administered by the state)*

Participating Facilities: *Chuck's Potash Company, Green and Go Fertilizers, Shag Rug, Inc., Troyville POTW, Alpha Limited*

Location: All facilities are less than a mile apart from each other along the Flowing River.

The facilities discharging to Flowing River have existing TP monitoring requirements. The existing permits require monthly monitoring for TP. The overlay permit will require monitoring at the same locations as established in the existing permits. In addition, each discharger will be required to monitor for phosphorus weekly during June through September. For the permitting authority to gauge compliance, the permit writer will develop permit language that requires each discharger to submit monthly discharge monitoring reports (DMRs) to the permitting authority by the 15th of the month following monitoring. Ambient receiving water monitoring requirements are included in the existing NPDES permits and are adequate to ensure that localized exceedances of water quality standards do not develop as a result of trades.

Permit Language:

1. Each permittee shall monitor effluent total phosphorus a minimum of one time per week at existing discharge monitoring locations established in each facility's existing NPDES permit during the months of June through September. Each permittee shall determine the average monthly mass loading based on actual monthly average flow. Flow monitoring shall be continuous.
2. During the remaining, off-season months, each permittee must monitor effluent total phosphorus at least one time per month in compliance with existing individual NPDES permit requirements and determine mass loading based on actual effluent flow. Each permittee shall monitor flow continuously.

Monitoring to Document Trades

The permitting authority should be aware of any monitoring responsibilities established in the trading program or through the credit exchange and should ensure that the permit conditions do not contradict these requirements. Where the trading program provides that the point source conduct additional monitoring to document trades, the permit should incorporate or reference those requirements. Where the trading program provides that a third-party conduct monitoring, the permit should also reference those requirements and clarify the permittee's responsibilities, if any, for reporting or conducting these activities itself should the third-party fail to fulfill its responsibilities.

Reporting Requirements

Reporting requirements should be established to support the permitting authority's evaluation of water quality trading programs. For example, in addition to reporting discharge monitoring results, permitting authorities might require a permittee to report the number of credits purchased. Permitting authorities might also require an annual monitoring report specific to the pollutants involved in the trade, to provide information on annual loading in accordance with the requirements of the trading program. Permits incorporating water quality trades should require reporting at a frequency appropriate to determine compliance with the trading provisions. Permitting authorities should consider any requirements of the trading programs related to reporting and ensure the permits are consistent with these requirements. Permits may require reporting of monitoring results at a frequency established through the permit on a case-by-case basis, but in no case may that frequency be less than once per year.

Trading programs may establish other reporting and tracking requirements as well. For example, it is essential to have a mechanism for tracking trades. An additional form could be required such as a credit certificate form (see [Appendix C](#)). The permitting authority can hold point sources liable if they violate any trading provision included in the permit or any trade agreement incorporated by reference into the permit, and point sources are also liable if they do not meet their permit limits.

Permitting authorities should consider establishing discharger trade reporting requirements to monitor trading activities and any alternative compliance activities implemented if a facility fails to generate credits as expected (see [Special Conditions](#)). In addition, credit exchanges should consider holding surplus credits in reserve to be used to compensate for point source pollutant loads if a failed trade and the permitting authority may want the credit exchange to report the generation of these reserve credits as well.

Data Reporting to EPA

EPA administers two systems to store NPDES permit data and track compliance, the Permit Compliance System (PCS) and the new Integrated Compliance Information System (ICIS). PCS is the old, computerized management information system that contains data on NPDES permit-holding facilities to track the permit, compliance, and enforcement status of these facilities.

The new system, ICIS, was deployed in June 2006 to approximately 20 states. ICIS contains integrated enforcement and compliance information across most of EPA's programs including all federal administrative and judicial enforcement actions. In addition, ICIS has the capability to track other activities occurring in an EPA Region that support enforcement and compliance programs. These include Incident Tracking, Compliance Assistance, and Compliance Monitoring. In the future, ICIS will be deployed to all states, and PCS will no longer be used.

Neither PCS nor ICIS is structured to actually track trades.

PCS is designed to compare actual discharge monitoring data against required effluent limitations to determine a facility's compliance with its NPDES permit. To determine compliance under a trading scenario, it is necessary for the NPDES permitting authority to compare



Flowing River Example: Reporting

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Participating Facilities: *Chuck's Potash Company, Green and Go Fertilizers, Shag Rug, Inc., Troyville POTW, Alpha Limited*

Location: All facilities are less than a mile apart from each other along the Flowing River.

An overlay permit is being developed for permittees in the Flowing River watershed to facilitate trading for permittees that wish to trade through the Flowing River Phosphorus Credit Exchange (Exchange). In addition to their existing, individual NPDES permits, each of the trading partners have applied for coverage under the overlay permit. The overlay permit requires, in addition to monitoring reports to the permitting authority, regular reporting of any changes to the Exchange's trade agreement and reports for tracking trades. This information can be compiled by each individual permittee or by the Exchange but must be reported to the permitting authority.

Because the overlay permit will contain seasonal, mass-loading effluent limitations for phosphorus for one particular season of the year, annual trade transactions will be necessary to maintain compliance. The trade agreement between the permittees and the Exchange indicates that trades will be tracked in an electronic trade tracking system. Credits must be used in the same period they are generated, and trading notification forms must be submitted to the regulatory agency by October 15.

Permit Language:

No trade is valid unless it is recorded in the Flowing River Phosphorus Credit Exchange electronic trade tracking system or equivalent system that records all trades and generates trading notification forms and a summary of all trades valid between June 1 and September 30 of each year, in substantially the same format as forms approved by the state. The record-keeping system must be capable of ensuring that a particular credit is not sold to more than one trading participant. The trading notification forms and trading summary may be compiled by the Exchange, but each permittee is responsible for the submittal of all documentation and reports. Trading notification forms for each trade must be submitted to the <Permitting Authority> by October 15.

actual discharge monitoring data and the quantity of credits purchased or pounds sold against required effluent limitations. For credit sellers, compliance is tracked against the WQBEL that serves as the facility's baseline. For credit buyers, compliance is actually tracked against two effluent limitations—the minimum control level and the baseline. The challenge in using PCS to determine compliance under a trading scenario is that the system does not automatically make adjustments to the reported actual discharge—it will not add or subtract the load traded. Therefore, this type of adjustment must be done before entering information into PCS so that the system has only one reported number to compare against an effluent limitation.

To determine compliance for a credit seller, the NPDES permitting authority will need to know that the sum of a credit seller’s actual discharge and the number of pounds sold is less than or equal to the most stringent effluent limitation (i.e., the baseline). Therefore, point source credit sellers could report the sum of the facility’s actual discharge and the number of pounds sold, and that amount would be entered into PCS. PCS would then compare the sum of the actual discharge and the number of pounds sold against the facility’s baseline; the sum should be less than or equal to the facility’s baseline to indicate that the facility is in compliance.

Point source credit buyers not only have a baseline, but also a minimum control level (the facility’s TBEL or current discharge, whichever is more stringent). To determine compliance for a credit buyer, the NPDES permitting authority will need to know that (1) the facility’s actual discharge is less than or equal to its minimum control level, and (2) that the number of credits purchased result in the facility achieving its baseline. Therefore, point source credit buyers could report two types of information: (1) the facility’s actual discharge, and (2) the difference between the actual discharge and the quantity of credits purchased. Both numbers would be entered into PCS to determine compliance. PCS would compare the actual discharge against the minimum control level to determine permit compliance and eligibility as a credit buyer. PCS would also compare the difference between the actual discharge and the quantity of credits purchased against the facility’s baseline; the difference should be less than or equal to the WQBEL to indicate that the facility has purchased enough credits to meet its baseline and remain in compliance with its WQBEL. PCS can accommodate two different effluent limits for the same parameter; therefore, it has the capability to determine compliance with both the minimum control level and the baseline for a credit buyer.

ICIS also allows the NPDES permitting authority to report two limits; therefore, this system can also accommodate both the baseline and the minimum control level for credit buyers. New DMR forms will also have two lines to report both the baseline and the minimum control level. Like PCS, ICIS does not actually adjust actual discharges with the load traded. Under the current design, ICIS will allow a facility with an existing NPDES permit to also have a trading partner entered into the system. Once a trading partner is entered for a facility, ICIS will allow the entry of an adjusted value—this is the reported actual discharge adjusted by the number of credits bought or sold. If an adjusted value is entered, this value is used to determine permit violations and percent exceedances (USEPA 2006).

In addition to challenges related to limits and the type of information to report, NPDES permits with trading provisions might also raise issues related to reporting periods and automated compliance tracking. PCS will not support a reporting extension beyond 30 days. This type of reporting extension might be necessary in some instances to allow adequate time for the administrative activities necessary for trading partners to coordinate and reconcile trades. ICIS, however, will support a 45-day reporting period. In rare instances when a permitting authority uses annual limits, both PCS and ICIS will allow for one limit to be monthly and one to be annual. However, the permitting authority will have to manually flag annual limit effluent violations for reportable noncompliance (RNC) and significant noncompliance (SNC) to track compliance.



Special Conditions

Special conditions are developed to supplement effluent limitations guidelines and may include requirements such as BMPs, additional monitoring activities, ambient stream surveys, and toxicity reduction evaluations (TREs). Special conditions also include permit modification and reopener conditions and can be used to address water quality trading or incorporate compliance schedules (if authorized by the permitting authority). Special conditions of a NPDES permit will be very important in incorporating the terms of a trade agreement. Even where the specific terms of the agreement are not directly incorporated into the permit, the special conditions will be used to refer to, and require compliance with, the trade agreement housed in a separate document.

The special conditions included in a NPDES permit that incorporates trading will depend on provisions of the trade agreement and the effluent limitations and monitoring and reporting requirements established in the permit. However, the permitting authority should consider incorporating special conditions that support the trading conditions. For example, the special conditions of the permit may specify how and when trades may be conducted among permittees or how an exceedance of an aggregate loading cap will be enforced among the permittees responsible for exceeding their individual loading limits.

Special conditions may also be used to establish provisional requirements that apply if the credits on which the trading limits are based are unavailable. Special conditions addressing group and individual liability, provisional requirements that apply when credits are unavailable or when an individual or collective limit is exceeded, and outlining the specific requirements for establishing trade agreements among permittees can be important in issuing acceptable permits that will not require modification each time circumstances change for one of the dischargers covered under the permit.

In addition, the special conditions section of the permit could include a compliance schedule. Permit compliance schedules for WQBELs are allowed only when state water quality standards or state regulations implementing such standards provide authority for using compliance schedules as well as when those limits are derived from water quality standards that were newly adopted or substantively revised after July 1, 1977. Most state water quality standards or implementing regulations authorize using compliance schedules. If compliance schedule authority is available, the permit writer could place a compliance schedule in the permit special conditions that would give the discharger time to comply with provisions related to WQBELs and trading when those provisions are intended to be phased in over time.

Water Quality Trading Scenarios



Flowing River Example: Special Conditions

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Participating Facilities: *Chuck's Potash Company, Green and Go Fertilizers, Shag Rug, Inc., Troyville POTW, Alpha Limited*

Location: All facilities are less than a mile apart from each other along the Flowing River.

The NPDES permit writer has reviewed the signed trade agreement for TP trading between the point sources and the Flowing River Watershed Phosphorus Credit Exchange. The agreement describes how each discharger will meet its new WQBEL through trading with the Exchange. The NPDES permit writer has developed the appropriate effluent limitations, monitoring, and reporting requirements for the each discharger. The special conditions in the NPDES permit focus on general authority, credit definition, notification of amendment to the trade agreement, notification of unavailability of credits, permit reopeners and modification provisions, and enforcement liability.

Permit Language:

General Authority

The permittee is authorized to participate in water quality trading with the Flowing River Watershed Phosphorus Credit Exchange, as specified in the trade agreement, for the purposes of complying with the phosphorus effluent limitations and the TMDL-related requirements of this permit (Table 1). The authority to use trading for compliance with these limits is derived from **<insert state law where applicable>** and section 402 of the federal Clean Water Act 33 United States Code (U.S.C.) section 1342. EPA's policies on Water Quality Trading (1/13/03) and Watershed-Based NPDES Permitting (1/7/03) endorse water quality credit trading. Additionally the Flowing River Phosphorus TMDL authorizes water quality trading as a means of achieving the allocations established by the TMDL.

Credit Definition

All credits used to comply with the effluent limitations of this permit will be measured in pounds of total phosphorous per day on a monthly average basis. One trading credit will be defined as one (1) unit of pollutant reduction (pound of total phosphorus) to Flowing River. All valid credits are tradable. The permittee may purchase credits from or sell credits to the Exchange so long as the treatment technologies used to generate credits are documented as providing pollutant reductions beyond the wasteload allocations established for the credit exchange members in the Flowing River Phosphorus TMDL.

Notification of Amendment to the Trade Agreement

The permittee is required to notify the permitting authority in writing within 7 days of the Flowing River Watershed Phosphorus Credit Exchange Trade Agreement being amended, modified, or

Flowing River Example: Special Conditions *(continued)*

revoked. This notification must include the details of any amendment or modification in addition to the justification for the change(s).

Notification of Unavailability of Credits

The permittee is required to notify the permitting authority in writing within 7 days of becoming aware that credits used or intended for use by the permittee to comply with the terms of this permit are unavailable or determined to be invalid. This notification must include an explanation of how the permittee will ensure compliance with the WQBELs established in this permit, either through implementation of on-site controls or by conducting an approved emergency phosphorus offset project approved by the NPDES permit writer.

Permit Reopeners, Modification Provisions

The permitting authority may, for any reason provided by law, summary proceedings or otherwise, revoke or suspend this permit or modify it to establish any appropriate conditions, schedules of compliance, or other provisions which may be necessary to protect human health or the environment or to implement the Flowing River phosphorus TMDL. The permitting authority may also reopen and modify the permit to suspend the ability to trade credits to comply with the total phosphorus effluent limitations in Table 1-1.

Enforcement Liability

The permittee is liable for meeting its most stringent effluent limitation. No liability clauses contained in other legal documents (e.g., trade agreements, contracts) established between the permittee and other authorized buyers and sellers are enforceable under this permit.

