

Water Quality Trading Scenario: Multiple Facility Point Source Trading

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Water Quality Trading Scenario: Multiple Facility Point Source Trading

This water quality trading scenario focuses on technical and programmatic issues related to multiple facility point source trading, illustrated in Figure 1. Multiple facility point source trading is distinguished from single point source–single point source trading by the fact that a group of point sources operate under a single trade agreement. All trades will be limited by the overall limit or cap set by the permit. Issues addressed under this scenario include the following:

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

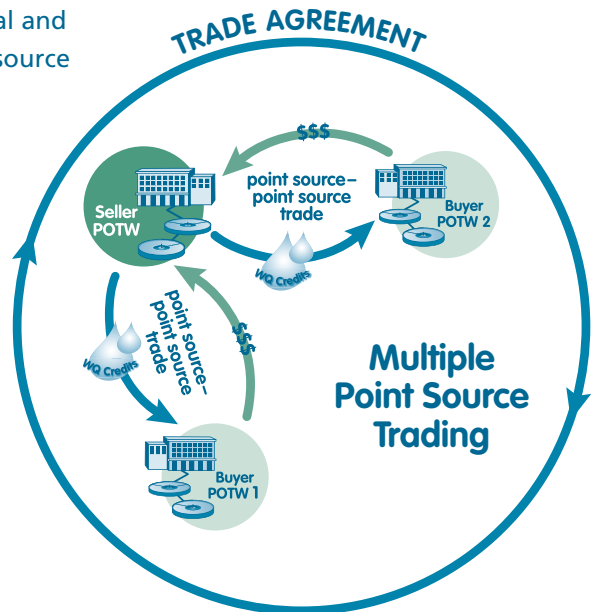


Figure 1. Multiple point source trading.

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.

Trade Agreements

Under multiple facility point source trading, trade agreements can specify the individual trades between specific point sources or can establish *ground rules* for trading to allow point sources to trade among themselves as needed. Typically, the terms that govern a trading program will be developed outside of 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, 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.

St. Martin River Example: Trade Agreements

■ What You Need to Know...

Pollutant: Total Phosphorus

Driver: Newly approved TMDL^a for Total Phosphorus for the St. Martin River Watershed

Credit Seller: *Shepherd County POTW^b*

Existing TBEL^c: 120 lbs/day (average monthly)

Current Loading: 120 lbs/day (average monthly)

New WQBEL^d (based on WLA^e): 110 lbs/day (average monthly)

POTW Treatment Capabilities: Treatment to 20 lbs/day (average monthly)

Credit Buyer #1: *City of Oakdale WWTP^f*

Existing TBEL: 50 lbs/day (average monthly)

Current Loading: 50 lbs/day (average monthly)

New WQBEL (based on WLA): 35 lbs/day (average monthly)

WWTP Treatment Capabilities: Treatment to 50 lbs/day (average monthly)

Credit Buyer #2: *Town of Barkley WWTP*

Existing TBEL: 50 lbs/day (average monthly)

Current Loading: 50 lbs/day (average monthly)

New WQBEL (based on WLA): 35 lbs/day (average monthly)

WWTP Treatment Capabilities: Treatment to 50 lbs/day (average monthly)

Notes: ^a TMDL = Total maximum daily load; ^b POTW = publicly owned treatment works; ^c TBEL = technology-based effluent limitations; ^d WQBEL = water quality-based effluent limitations; ^e WLA = wasteload allocation; ^f WWTP = wastewater treatment plant

Watershed: Shepherd County POTW (credit seller) is approximately 9 miles upstream from the city of Oakdale WWTP (credit buyer 1) and 10 miles upstream from the town of Barkley WWTP (credit

St. Martin River Example: Trade Agreements *(continued)*

buyer 2) along the St. Martin River. All three facilities discharge into a segment of the river that has been listed as impaired for nutrients, and a phosphorus TMDL has just been approved.

Applicable Trading Ratios:

- Delivery:** On the basis of best available science, a delivery ratio of 3:1 ratio is needed for trades between Shepherd County POTW and either of the two credit buyers to account for the fate and transport of total phosphorus (TP) over the distance between the facilities. It is not necessary to apply an equivalency ratio because the same pollutant form is being traded, nor an uncertainty ratio because all parties can accurately monitor end-of-pipe loads.

The facilities' existing individual permits include TBELs based on state treatment standards for TP. The permittees currently meet these TBELs. These existing effluent limitations are less stringent than the limitations needed to meet the new WLAs established in the St. Martin River TMDL. To facilitate meeting the TMDL, the permitting authority has issued a watershed-based overlay permit that addresses phosphorus discharges from each of the three facilities. This permit also authorizes trading between Shepherd County and each of the two WWTPs downstream.

Shepherd County POTW is a large, new facility and has the potential to treat its discharge to a phosphorus loading of 20 lbs/day. The facility's baseline requirement for trading is 110 lbs/day (i.e., most stringent effluent limitation). Treating to the maximum capacity of the POTW would result in an excess phosphorus reduction of 90 lbs/day (baseline – treatment capacity = excess reduction).

The city of Oakdale and the town of Barkley WWTPs have not been upgraded and have no funds to upgrade to meet the new WLA. Both are small, rural localities and are not projecting substantial growth. The permitting authority is allowing both facilities to trade to meet their new WLAs (i.e., baselines). However, to trade, both WWTPs would need continue to treat their discharges to meet the existing TBELs (i.e., the minimum control level). Both facilities would then be allowed to purchase credits equivalent to the difference between the minimum control level and the baseline (50 lbs/day – 35 lbs/day = 15 lbs/day).

According to best available science, the permitting authority has determined that the application of a 3:1 delivery ratio is necessary to account for the fate and transport of phosphorus over the distance between the seller (Shepherd County POTW) and the buyers. Therefore, for the buyers to account for the 15 lbs/day of phosphorus loading necessary to compensate for each WWTP's discharge and meet their baselines, each must purchase 45 lbs/day (monthly average) from the Shepherd County POTW (15 lbs/day offset needed × 3:1 delivery ratio = 45 lbs/day needed). The POTW seller can generate 90 lbs/day and, therefore, has an adequate supply of phosphorus credits to sell.

The facilities have decided to enter into a trade agreement with each other. The basic terms of the trade agreement are as follows:

- A trade ratio of 3:1 applies to trades between the buyer and sellers because of the distance between them.
- Shepherd County POTW (seller) will install control technologies that will result in a 90 lbs/day of surplus load reduction eligible for trading.

St. Martin River Example: Trade Agreements *(continued)*

- Shepherd County POTW has a trading limit = 110 lbs/day – Quantity of Pounds Sold.
- City of Oakdale WWTP (credit buyer 1) has a WQBEL (baseline) of 35 lbs/day that must be met through trading, treatment, or pollution prevention. The facility’s minimum control level is the existing TBEL of 50 lbs/day (average monthly) based on the TBEL for TP. The facility’s current discharge of 50 lbs/day meets the existing TBEL.
- City of Oakdale WWTP (credit buyer 1) needs to purchase credits equivalent to 15 lbs/day of TP (baseline–minimum control level).
- Town of Barkley (credit buyer 2) has a WQBEL (baseline) of 35 lbs/day that must be met through trading, treatment or pollution prevention. The facility’s minimum control level is its existing TBEL, which is a loading limit of 50 lbs/day of TP. The facility’s current discharge of 50 lbs/day meets the existing TBEL.
- Town of Barkley WWTP (credit buyer 2) needs to purchase credits equivalent to 15 lbs/day of TP (baseline–minimum control level).
- Each facility will continue to monitor TP as required under each facility’s respective individual NPDES permits.
- Trades occur monthly and credits may not be applied in any month other than the one in which the credits are generated.
- Each facility will continue to complete and submit Discharge Monitoring Report (DMR) forms to the NPDES permitting authority, as required under each facility’s NPDES permit. In addition to DMR reporting, each facility will complete and exchange monthly Phosphorus Analysis Reports to track the amount of TP discharged and the total amount of TP load bought and sold between the facilities.
- Separate contracts between the seller and two buyers articulate the financial and liability conditions that each pair of facilities has agreed upon.

The NPDES permit writer for the facilities receives a written copy of the trade agreement that is signed and dated by authorized representatives of each facility. The permit writer reviews the written trade agreement to identify information that is pertinent to each facility’s NPDES permit. The permit writer incorporates provisions that outline trade-specific effluent limitations (i.e., baselines, the minimum control levels for the buyers, and the trading limit for the seller) and reporting and monitoring provisions.

The permit writer incorporates the Phosphorus Analysis Report provision of the trade agreement into the permit to require the facilities to submit trade information to the permitting authority. This will allow the permitting authority to determine whether the buyers and seller maintain compliance with WQBELs and applicable TBELs. Other components of the trade agreement, such as issues of liability and penalty payment, are not enforceable through the NPDES permit and, therefore, would not be incorporated into the compliance provisions of each NPDES permit.

The permit writer, with input from the permittees, will develop an overlay NPDES permit that addresses only TP requirements for the three facilities. The permit writer will reference the written trade agreement in the fact sheet of the group’s overlay NPDES permit.

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 process 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). 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 establishes clear 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.

Clean Water Services, Oregon

The Oregon Department of Environmental Quality addresses water quality trading on the cover page of the permit issued to Clean Water Services. 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 TBELs, or the equivalent, and where necessary, 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 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 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 and each discharger complies with any applicable TBELs. 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.

Truckee Meadows Water Reclamation Facility, Nevada

The Nevada Division of Environmental Protection authorized individual and aggregate effluent limitations in a permit issued to Truckee Meadows Water Reclamation Facility. For more information about this trading program, see Appendix A.

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 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, then 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.

St. Martin River Example: Effluent Limitations

■ What You Need to Know...

Pollutant: Total Phosphorus

Driver: Newly approved TMDL for Total Phosphorus for the St. Martin River Watershed

Credit Seller: *Shepherd County POTW*

Existing TBEL: 120 lbs/day (average monthly)

Current Loading: 120 lbs/day (average monthly)

New QBEL (based on WLA): 110 lbs/day (average monthly)

POTW Treatment Capabilities: Treatment to 20 lbs/day (average monthly)

Credit Buyer #1: City of Oakdale WWTP

Existing TBEL: 50 lbs/day (average monthly)

Current Loading: 50 lbs/day (average monthly)

New QBEL (based on WLA): 35 lbs/day (average monthly)

WWTP Treatment Capabilities: Treatment to 50 lbs/day (average monthly)

Credit Buyer #2: Town of Barkley WWTP

Existing TBEL: 50 lbs/day (average monthly)

Current Loading: 50 lbs/day (average monthly)

New QBEL (based on WLA): 35 lbs/day (average monthly)

WWTP Treatment Capabilities: Treatment to 50 lbs/day (average monthly)

Watershed: Shepherd County POTW (credit seller) is approximately 9 miles upstream from the city of Oakdale WWTP (credit buyer 1) and 10 miles upstream from the town of Barkley WWTP (credit buyer 2) along the St. Martin River. The segment of river to which all three facilities discharge has been listed as impaired for nutrients, and a phosphorus TMDL has just been approved.

Applicable Ratios:

- **Delivery:** The trading program has established a 3:1 ratio for trades between Shepherd County POTW and either of the two credit buyers to account for the distance between the facilities.

The facilities' existing individual permits include TBELs based on state treatment standards for TP. The permittees currently meet these TBELs. These existing effluent limitations are less stringent than the limitations needed to meet the new WLAs established in the St. Martin River TMDL. To facilitate meeting the TMDL, the permitting authority has issued a watershed-based overlay permit that addresses phosphorus discharges from each of the three facilities. This permit also authorizes trading between Shepherd County POTW and each of the two WWTPs downstream.

St. Martin River Example: Effluent Limitations (continued)

If the Shepherd County POTW chooses to sell 90 lbs/day of the credits generated by the over control of its discharge, a trading limit will apply as follows:

$$\text{Baseline} - \text{Pounds Sold} = \text{Trading Limitation}$$

$$110 \text{ lbs/day} - 90 \text{ lbs/day} = 20 \text{ lbs/day}$$

The POTW will be required to demonstrate that its discharge has an actual loading of no more than 20 lbs/day during any period it is trading with the buyer WWTPs.

A new overlay permit is being developed, which implements the new phosphorus WQBELs and authorizes trading between the facilities. Upon issuance of the permits, the new WQBELs and trading provisions will apply. The permits will include effluent limitations equal to baselines, minimum control levels, and trading limits.

Table 1. Monthly average mass-based effluent limitations for TP

| Facility | Units | Effluent limitation without trading | Effluent limitation with trading |
|----------------------|---------|-------------------------------------|----------------------------------|
| Shepherd County POTW | lbs/day | 110 (Baseline/WQBEL) | 20 ^a |
| City of Oakdale WWTP | lbs/day | 35 (Baseline/WQBEL) | 50 (Minimum Control Level/TBEL) |
| Town of Barkley WWTP | lbs/day | 35 (Baseline/WQBEL) | 50 (Minimum Control Level/TBEL) |

^aTrading limit = (WQBEL – pollutant loading necessary to generate quantity of credits sold)

Permit Language:

Shepherd County POTW

- A. The permittee shall be in compliance with the monthly average effluent limitations for total phosphorus in this permit if:
 - a. The permittee has not sold any credits and the permittee’s average monthly mass loading of total phosphorus is less than or equal to the Baseline (Effluent Limitation Without Trading) set forth in Table 1; or,
 - b. The permittee has sold total phosphorus credits such that the effluent loading does not exceed the Trading Limit (Effluent Limitation with Trading) established in Table 1.
- B. Credits sold and purchased may be applied only to the calendar month(s) in which they were generated.

City of Oakdale WWTP and Town of Barkley WWTP

- A. The permittee shall be in compliance with the monthly average effluent limitations for total phosphorus in this permit if:
 - a. The permittee has not purchased any credits and the permittee’s average monthly mass loading of total phosphorus is less than or equal to the Baseline (Effluent Limitation Without Trading) set forth in Table 1; or,

St. Martin River Example: Effluent Limitations *(continued)*

Permit Language (continued):

- b. The permittee’s effluent loading does not exceed the Minimum Control Level (Effluent Limitation With Trading) established in Table 1 and the permittee has purchased credits equivalent or greater than the difference between the baseline and the minimum control level.
- B. Credits sold and purchased may be applied only to the calendar month(s) in which they were generated.

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, 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 total nitrogen (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.

St. Martin River Example: Pollutant Form, Units of Measure, and Timing

■ What You Need to Know...

Pollutant: Total Phosphorus

Driver: Approved TMDL for Total Phosphorus on the St. Martin River

Credit Seller: *Shepherd County POTW*

Credit Buyers: *City of Oakdale and Town of Barkley WWTPs*

Pollutant Form

All trading partners discharge phosphorus year round. The TMDL indicates a need to control TP discharges. Each facility discharges the same form of phosphorus at the same percentage of solubility; therefore, no provisions are necessary in the permit to address the issue of pollutant form.

Units of Measure

The TP WQBELs based on the TMDL WLAs are expressed in lbs/day as a monthly average to correspond with the units and averaging period in the TMDL. The limits in the trading partners' permits are also expressed in lbs/day as a monthly average. Monthly trades will be based on average monthly reductions demonstrated through monitoring.

Timing of Credits

Credits will be available immediately upon permit issuance. Trades will occur monthly to correspond with monthly average effluent limitations. The purchased credits must be applied by the buyers during the same month that the seller generates them. The POTW will be able to continue to generate credits as long as the controls are properly operated and maintained, the facility is able to demonstrate reductions, and the facility does not become subject to more stringent requirements (i.e., newly promulgated effluent guidelines or other more stringent technology-based controls or additional WQBELs to avoid localized exceedances of water quality standards) that would reduce or eliminate the credits generated. The ability of the seller 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 (Clean Water Act (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, 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.

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.

Neuse River Basin, North Carolina

The state of North Carolina Department of Environment and Natural Resources included monitoring provisions in a permit issued to the NRCA and its co-permittee members to control nitrogen discharges. These provisions require members of the NRCA to monitor their discharge as specified in their individual permits. In addition, the NRCA compiles and submits members' nitrogen monitoring results. Each member also has individual ambient monitoring requirements, but the NRCA is not required to conduct ambient monitoring. For more information about this trading program, see Appendix A.

The permitting authority might use a different approach for specifying monitoring requirements, depending on the type of permit. For example, 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 overlay 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, may 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.

St. Martin River Example: Monitoring

■ What You Need to Know...

Pollutant: Total Phosphorus

Driver: Approved TMDL for Total Phosphorus on the St. Martin River

Credit Seller: *Shepherd County POTW*

Credit Buyers: *City of Oakdale and Town of Barkley WWTPs*

Location: The dischargers are in the St. Martin River watershed.

The facilities have existing TP monitoring requirements. The overlay permit will require monitoring at the same locations as established in the existing permits. In addition, the existing permit requires monthly monitoring for TP. Each discharger will be required to monitor for phosphorus weekly. For the permitting authority to gauge compliance, the permit writer will develop permit language that requires each discharger to submit monthly 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:

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. Each permittee shall determine the average monthly mass loading based on actual monthly average flow. Flow monitoring shall be continuous.

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.

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 monitoring and 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.

St. Martin River Example: Reporting

■ What You Need to Know...

Pollutant: Total Phosphorus

Credit Seller: *Shepherd County POTW*

Credit Buyers: *City of Oakdale and Town of Barkley WWTPs*

Location: The dischargers are located in the St. Martin River watershed.

Applicable Ratios:

- **Delivery:** The trading program has established a 3:1 ratio for trades between Shepherd County POTW and either of the two credit buyers to account for the distance between the facilities.

An overlay permit is being developed for permittees in the St. Martin River watershed to facilitate trading. In addition to their existing, individual NPDES permits, each of the trading partners has applied for coverage under the overlay permit. The permit requires, in addition to monitoring reports, regular reporting of any changes to the trade agreement and reports for tracking trades. Because the facilities' individual permits contain monthly average effluent limitations for TP, monthly trade transactions will be necessary to maintain compliance. The trade agreement between the dischargers indicates that trades will be tracked by individual dischargers. Also, trading notification forms for trades between trading partners and monthly trading summaries for the entire program will be submitted by each discharger. Credits must be used in the same month they are generated and trading notification forms must be submitted to the regulatory agency by the 15th of the month following the trade. The permit gives the facilities 15 days to report the trades to account for administrative time and processing notification forms.

In addition, the permit requires biannual reporting to summarize year-to-date transactions and actual reductions and loading reflected by monitoring.

Permit Language:

No trade is valid unless it is recorded by both the credit buyer and the credit seller and trading notification forms and a monthly summary of all trades for each calendar month are submitted to the permitting authority. The record-keeping system employed by the permittee must be capable of ensuring that a particular credit is not sold to more than one trading participant. Trading notification forms for each monthly trade must be submitted to **<the Permitting Authority>** by the 15th day of the month following the trade.

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 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 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 reopen 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 implements 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. 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.

St. Martin River Example: Special Conditions

■ What You Need to Know...

Pollutant: Total Phosphorus

Credit Seller: *Shepherd County POTW*

Credit Buyers: *City of Oakdale and Town of Barkley WWTPs*

Location: The dischargers are in the St. Martin River watershed.

Applicable Ratios:

- **Delivery:** The trading program has established a 3:1 ratio for trades between Shepherd County POTW and either of the two credit buyers to account for the distance between the facilities.

The permit writer has developed the appropriate effluent limitations, monitoring, and reporting requirements for each facility. The special conditions for each facility’s permit focus on general authority, credit definition, permit reopeners and modification provisions, and enforcement liability.

Permit Language:

General Authority

The permittee is authorized to participate in trading for the purposes of complying with the total phosphorus effluent limitations in Section X of this permit. The authority to use trading for compliance with these limits is derived from: <insert state law if applicable>; section 402 of the federal Clean Water Act 33 United States Code (U.S.C.) section 1342; and 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 St. Martin River TMDL authorizes water quality trading as a means of achieving the allocations established by the TMDL.

Credit Definition

One credit purchased by the buyers will be equal to three pounds of total phosphorous per day on a monthly average basis generated by the seller.

Permit Reopeners, Modification Provisions

The permitting authority may, for any reason provided by law, summary proceedings or otherwise, revoke or suspend this permit or reopen and 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 St. Martin River 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 Section X of this permit.

Enforcement Liability

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