Water Quality Trading Scenario: *Single Point Source–Single Point Source Trading*

Contents

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This water quality trading scenario focuses on technical and programmatic issues related to single point source–single point source trading, illustrated in Figure 1. 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

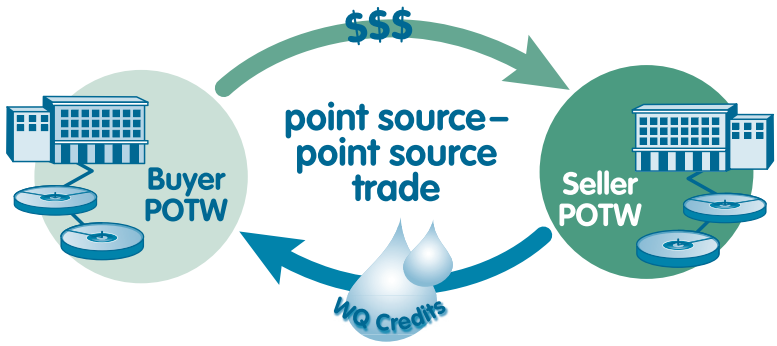

Figure 1. Point source–point source trade.

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

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 or 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 generate 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

Mystic River Example: Trade Agreements

What You Need to Know...

Pollutant: Total Phosphorus

Driver: Newly approved TMDL[a] for Total Phosphorus for the Mystic River

Credit Seller: ***Meadeville Fertilizer Producers***

Current Load: 80 lbs/day (average monthly)

New WQBEL[b] (based on WLA[c]): 57 lbs/day (average monthly)

Existing TBEL: 35 mg/L (average monthly) at an average flow of 300,000 gpd[e] = 82 lbs/day

Existing Treatment: None

Proposed New Treatment Capabilities: Treatment to 40 lbs/day (average monthly)

Credit Buyer: ***Auburn Carpet Manufacturers***

Current Load: 40 lbs/day (average monthly)

New WQBEL (based on WLA): 29 lbs/day (average monthly)

Existing TBEL: 1 mg/L (average monthly) at an average flow of 5 mgd[f] = 42 lbs/day

Existing Treatment Capabilities: Treatment to 40 lbs/day

Proposed New Treatment Capabilities: None

Notes: [a] TMDL = Total maximum daily load; [b] WQBEL = water quality-based effluent limitation; [c] WLA = wasteload allocation; [d] TBEL = technology-based effluent limitations; [e] gpd = gallons per day; [f] mgd = million gallons per day

Location: Meadeville Fertilizer Producers (credit seller) is approximately one mile upstream from Auburn Carpet Manufacturers (credit buyer) along the Mystic River.

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 minimum control level for Auburn Carpet Manufacturers is 40 lbs/day (existing discharge), because this level is more stringent than the TBEL (42 lbs/day) at the current level of discharge. Therefore, Auburn Carpet Manufacturers (buyer) needs to purchase credits equivalent to 11 lbs/day of total phosphorus (TP) to meet its WLA (baseline) under the TMDL. Auburn Carpet Manufacturers has arranged to purchase equivalent credits from Meadeville Fertilizer Producers. Meadeville Fertilizer Producers (seller) has a baseline of 57 lbs/day (WLA) and new treatment will treat to 40 lbs/day of TP loading. With this surplus of 17 lbs/day, Meadeville Fertilizer Producers can sell 11 TP credits to Auburn Carpet Manufacturers (with no applicable ratios) and will still have 6 lbs/day of surplus TP credits potentially available for sale to other permittees.

Mystic River Example: Trade Agreements *(continued)*

The NPDES permit writer worked with the facilities and other key stakeholders to craft the provisions of the trade agreement and provided the necessary information (e.g., baseline, minimum control levels) to facilitate the trade. As required, the permitting authority 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 verify that the information is accurate and consistent with water quality standards. The permit writer develops permit requirements that are consistent with the provisions in the trade agreement, and incorporates those requirements in specific sections of the permit on effluent limitations (i.e., baseline, the minimum control level for the buyer and the trading limit for the seller), 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 buyer and seller maintain compliance with WQBELs and applicable TBELs.

In addition to developing permit requirements coordinated with the provisions of the trade agreement, the permit writer will reference the written trade agreement in the fact sheets of each facility's NPDES permit and include copies of the signed trade agreement as an attachment. Each NPDES permit fact sheet will state that the facility's effluent limitation requirements are based on the WLA for the facility under the approved TMDL developed to achieve water quality standards; the permit authorizes the use of trading as a tool to comply with the required WQBELs, and the permit contains provisions that reflect the relevant terms of the written trade agreement signed by both parties.

The basic terms of the trade agreement are as follows:

- Trading partners more than one mile apart must apply a delivery ratio to all trades. Trading partners that discharge different forms of phosphorus must apply an equivalency ratio to all trades. (In the case of the trade between Meadeville Fertilizer Producers and Auburn Carpet Manufacturers, a delivery ratio is not necessary because they are only one mile from each other on the Mystic River. An equivalency ratio is not necessary because the facilities discharge the same form of phosphorus, and an uncertainty ratio is not necessary because each party is able to accurately monitor end-of-pipe loads.)
- A credit seller must first meet its baseline before generating credits eligible for trading. (Meadeville Fertilizer Producers will install control technologies that will treat to a phosphorus loading of 40 lbs/day and must meet its WLA (baseline) of 57 lbs/day, which will result in 17 lbs/day of surplus (monthly average) load reduction eligible for trading.)
- A credit seller is subject to trading limits. A trading limit is calculated by subtracting the quantity of credits sold from the baseline.
  (Meadeville Fertilizer Producers has a trading limit = 57 lbs/day – Quantity of Credits Sold.)
- A credit buyer can purchase credits to meet its facility's baseline. However, the credit buyer must first meet the facility's minimum control level before purchasing credits to meet the required baseline. (Auburn Carpet Manufacturers must meet its WLA (baseline) of 29 lbs/day. The facility's minimum control level equals the facility's current discharge of 40 lbs/day. This

Mystic River Example: Trade Agreements *(continued)*

current discharge meets the existing TBEL of 1 mg/L (average monthly) of TP at the current level of discharge (5 mgd), which is equivalent to 42 lbs/day at the current level of discharge. The facility must continue to meet the minimum control level of 40 lbs/day before purchasing credits to meet its baseline. When Meadeville Fertilizer Producers' new control technologies are fully implemented, Auburn Carpet Manufacturers will purchase credits equivalent to 11 lbs/day of TP.)

- Credit buyers and sellers must conduct TP monitoring that complies with regulatory agency requirements. In addition, credit buyers and sellers must 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. (Each facility will continue to monitor TP as required under each facility's respective individual NPDES permit. Each facility will continue to complete and submit Discharge Monitoring Report (DMR) forms to the NPDES permitting authority, as required under each facility's respective NPDES permit. In addition, each facility will complete and exchange the monthly Phosphorus Analysis Reports.)
- Trades occur monthly, and credits may not be applied in any month other than the one in which the credits are generated.

In a separate contract, Meadeville Fertilizer Producers and Auburn Carpet Manufacturers articulate the financial and liability conditions that the two facilities have agreed upon.

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.

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, 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 provisions of 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).

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

Mystic River Example: Effluent Limitations

What You Need to Know...

Pollutant: Total Phosphorus

Driver: Newly approved TMDL for Total Phosphorus for the Mystic River

Credit Seller: ***Meadeville Fertilizer Producers***

Current Load: 80 lbs/day (average monthly)

New WQBEL (based on WLA): 57 lbs/day (average monthly)

Existing TBEL: 35 mg/L (average monthly) at an average flow of 300,000 gpd = 82 lbs/day

Existing Treatment: None

Proposed New Treatment Capabilities: Treatment to 40 lbs/day (average monthly)

Credit Buyer: ***Auburn Carpet Manufacturers***

Current Load: 40 lbs/day (average monthly)

New WQBEL (based on WLA): 29 lbs/day (average monthly)

Existing TBEL: 1 mg/L (average monthly) at an average flow of 5 mgd = 42 lbs/day

Existing Treatment Capabilities: Treatment to 40 lbs/day

Proposed New Treatment Capabilities: None

Location: Meadeville Fertilizer Producers (credit seller) is approximately one mile upstream from Auburn Carpet Manufacturers (credit buyer) along the Mystic River.

Applicable Trade Ratios: None.

Auburn Carpet Manufacturers' existing permit includes a TBEL based on state treatment standards for TP, which the facility currently meets. Meadeville Fertilizer Producers is also subject to a TBEL based on existing federal effluent limitation guidelines. Existing effluent limitations for each facility are less stringent than the limitations needed to meet the new WLAs established in the Mystic River TMDL.

Meadeville Fertilizer Producers has recently been upgraded and has the potential to treat its discharge to a phosphorus loading of 40 lbs/day. The facility's baseline requirement for trading is 57 lbs/day (i.e., most stringent effluent limitation). Treating to the maximum capacity of the publicly owned treatment works (POTW) would result in an excess phosphorus reduction of 17 lbs/day (baseline – treatment capacity).

Auburn Carpet Manufacturers has no funds to upgrade to meet the facility's new WLA. The permitting authority is allowing the facility to trade to meet its new WQBEL (baseline based on WLA). The facility's current discharge of 40 lbs/day meets the existing TBEL of 42 lbs/day at the current level of discharge. To participate in trading, the facility must continue to treat to the current level of loading

Mystic River Example: Effluent Limitations *(continued)*

(minimum control level) before purchasing credits to meet its baseline. Auburn Carpet Manufacturers would then be allowed to purchase credits equivalent to the difference between the minimum control level and the baseline (40 lbs/day – 29 lbs/day = 11 lbs/day).

On the basis of the provisions of the trade agreement, the permitting authority has verified that no trade ratios are necessary: fate and transport is not a significant issue because of the proximity of the facilities; they are discharging the same form of phosphorus; and there is no uncertainty because of direct measurement of TP loads.

If Meadeville Fertilizer Producers chooses to sell 11 lbs/day of the credits generated by the over treatment of its discharge, a trading limit will apply as follows:

Baseline – Credits Traded = Trading Limitation

57 lbs/day – 11 lbs/day = 46 lbs/day

Meadeville Fertilizer Producers will be required to demonstrate that its discharge has an actual loading of no more than 46 lbs/day during any period it is selling 11 lbs/day of credits to Auburn Carpet Manufacturers.

New permits are being developed to implement the new WLAs and authorize trading between the two facilities. The permits contain both interim and final effluent limitations. Interim effluent limitations are equal to current discharge, which is less than the existing TBEL for each facility. The new WQBELs and, therefore, trading provisions apply 2 years after the effective date of the permit. The permits will include effluent limitations equal to baselines, minimum control levels, and trading limits.

Permit Language:

Meadeville Fertilizer Producers

A. Meadeville Fertilizer Producers (permittee) is subject to interim and final effluent limitations for the discharge of total phosphorus from Outfall 001. As of **<insert permit effective date>**, the permittee must meet an interim mass-based effluent limitation for total phosphorus of 80 lbs/day as a monthly average at Outfall 001. Through treatment or other pollutant reductions at the facility, the permittee must meet a final mass-based effluent limitation for total phosphorus of 57 lbs/day as a monthly average at Outfall 001. Compliance with the final effluent limitations is required on **<insert date 24 months after permit effective date>**.

B. The permittee is authorized to generate and sell credits to an authorized credit Buyer or Buyers by further treating or otherwise reducing the discharge of phosphorus at Outfall 001. If the permittee sells such credits, the average monthly effluent limitation of 57 lbs/day no longer applies and the trading limit for total phosphorus at Outfall 001 shall apply instead as follows:

Monthly Average Trading Limitation = 57 lbs/day – Quantity of Credits Sold.

C. Credits sold and purchased may be applied only to the calendar month(s) in which they were generated.

Mystic River Example: Effluent Limitations *(continued)*

Permit Language (continued):

Auburn Carpet Manufacturers

A. Auburn Carpet Manufacturers (permittee) is subject to interim and final effluent limitations for the discharge of total phosphorus from Outfall 001. As of **<insert permit effective date>**, the permittee must meet an interim mass-based effluent limitation for total phosphorus of 40 lbs/day as a monthly average at Outfall 001. Through treatment or other pollutant reductions at the facility, the permittee must meet a final mass-based effluent limitation for total phosphorus of 29 lbs/day as a monthly average at Outfall 001. Compliance with the final effluent limitations is required on **<insert date 24 months after permit effective date>**.

B. If the final effluent limitation is met through trading, the permittee must purchase credits from authorized Sellers in an amount sufficient to compensate for the discharge of total phosphorus from Outfall 001 that is in excess of 29 lbs/day as a monthly average, but at no time shall the maximum mass discharge of total phosphorus from Outfall 001 exceed 40 lbs/day. Thus, the maximum mass discharge to be offset through credit purchases is 11 lbs/day as a monthly average.

C. Credits sold and purchased may be applied only to the calendar month(s) in which they were generated.

near the point of discharge but not one that is less stringent 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.

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.

Mystic 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 Mystic River

Credit Seller: ***Meadeville Fertilizer Producers***

Credit Buyer: ***Auburn Carpet Manufacturers***

Pollutant Form

Both 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 WLA are expressed in lbs/day as a monthly average to correspond with the units and averaging period in the TMDL. The TP limits in Meadeville Fertilizer Producers' existing permit 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

Consistent with the state water quality standards, the permits include a 2-year compliance schedule for the new WQBELs derived from the TMDL requirements. These compliance schedules are included in the Special Conditions section of the permits for Meadeville Fertilizer Producers and Auburn Carpet Manufacturers. According to these compliance schedules, Auburn Carpet Manufacturers would not have a need to purchase credits until 24 months after permit issuance. This allows 12 months for Meadeville Fertilizer Producers to get its control technology fully operational and 12 months for the facility to gather monitoring data to verify that the technology is achieving the expected treatment efficiency and will generate credits as expected. These data are necessary to better understand how loading and reduction may vary over time and to develop monthly credit generation data to correspond with monthly average effluent limitations. Trades will occur monthly to correspond with monthly average effluent limitations. Meadeville Fertilizer Producers 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, additional WQBELs to avoid localized exceedances of water quality standards) that would reduce or eliminate the credits. The ability of Meadeville Fertilizer Producers to continue to generate credits will be assessed during the renewal of the permit 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 toward 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 the trade agreement. 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, recordkeeping 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

If appropriate, the sampling locations should be consistent with the sampling location in each facility's existing individual NPDES permit. For example, the same location used to sample for compliance with effluent limitations in the existing permit should be used for determining compliance with new 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.

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.

Mystic River Example: Monitoring

What You Need to Know...

Pollutant: Total Phosphorus

Driver: Approved TMDL for Total Phosphorus on the Mystic River

Credit Seller: ***Meadeville Fertilizer Producers***

Credit Buyer: ***Auburn Carpet Manufacturers***

Each facility is covered under an existing permit that includes a TBEL; therefore, each facility is currently required to monitor its effluent monthly for TP to determine compliance. New permits have been developed for both facilities that incorporate new effluent limits based on the approved TMDL, as well as the necessary provisions and effluent limits to authorize trading.

In the new permits, each discharger will be required to monitor for TP weekly. 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:

Both facilities

The permittee shall monitor effluent total phosphorus a minimum of one time per week. The permittee shall determine the average monthly mass loading based on actual monthly average flow. Flow monitoring shall be continuous.

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 may be used 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.

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, which 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.

Mystic River Example: Reporting

What You Need to Know…

Pollutant: Total Phosphorus

Driver: Approved TMDL for Total Phosphorus on the Mystic River

Credit Seller: *Meadeville Fertilizer Producers*

Credit Buyer: *Auburn Carpet Manufacturers*

Trades must be completed by a credit transfer deadline specified in the permit, and credits must be used in the same month they are generated; however, the permit allows the facilities 30 days to report the trades to account for administrative time and processing of notification forms. For the permitting authority to gauge compliance, the permit writer develops permit language that requires each discharger to submit monthly DMRs to the permitting authority by the 15th of the month following monitoring. In conjunction with DMR reporting, the permit writer requires each facility to complete monthly Phosphorus Analysis Reports to track the amount of TP discharged and the total amount of TP load bought and sold between the facilities. Each discharger must submit the monthly Phosphorus Analysis Reports to the permitting authority and to the other facility.

Permit Language:

Meadeville Fertilizer Producers

The Permittee must submit monthly discharge monitoring reports (DMRs) by the 15th day of the month following monitoring to the [Permitting Authority] for determining compliance with the effluent limitations provided in Section X of this permit. If the Permittee sells credits, as authorized under Section X of this permit, the Permittee must also complete and submit a monthly Phosphorus Analysis Report to both the permitting authority and all authorized credit buyers. The Phosphorus Analysis Report must contain the information provided on the monthly DMR and the amount of credits sold to all authorized credit buyers.

Auburn Carpet Manufacturers

The Permittee must submit monthly discharge monitoring reports (DMRs) by the 15th day of the month following monitoring to the [Permitting Authority] for determining compliance with the effluent limitation provided in Section X of this permit. If this effluent limitation is met through trading, the Permittee must complete and submit a monthly Phosphorus Analysis Report to both the permitting authority and all authorized credit sellers. The Phosphorus Analysis Report must contain the information provided on the monthly DMR and the amount of credits purchased from all authorized credit sellers to compensate for the discharge of total phosphorus from Outfall 001.

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 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 can 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.

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 substantially 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.

Mystic River Example: Special Conditions

What You Need to Know…

Pollutant: Total Phosphorus

Driver: Approved TMDL for Total Phosphorus on the Mystic River

Credit Seller: *Meadeville Fertilizer Producers*

Credit Buyer: *Auburn Carpet Manufacturers*

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, compliance schedule, 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>** 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 Mystic River TMDL authorizes water quality trading as a means of achieving the allocations established by the TMDL.

Credit Definition

One credit will be equal to one in pound of total phosphorous per day on a monthly average basis. No trade ratios apply to the permittee's trades; therefore, each credit purchased by an authorized buyer shall correspond to a one pound per day reduction by an authorized seller.

Permit Reopeners, Modification Provisions

The permitting authority may, for any reason provided by law, by 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 Mystic 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.

Compliance Schedule

This permit includes both interim and final effluent limitations for the discharge of total phosphorus from Outfall 001. Compliance with the final effluent limitations is required on **<insert date 24 months after permit effective date>**.

Mystic River Example: Special Conditions *(continued)*

Permit Language (continued):

By March 1 of each year, the permittee shall submit a Compliance Plan Annual Report to describe the progress of actions undertaken to reduce total phosphorus discharges in the effluent discharged from Outfall 001 or to purchase equivalent credits and achieve compliance with the final effluent limitations for the discharge of total phosphorus from Outfall 001 by **<insert date 24 months after permit effective date>**.

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.