



# Rock River Basin, Wisconsin

## Coordinated Individual Permits

### Overview

The Wisconsin Department of Natural Resources (WDNR) uses coordinated individual permits to synchronize compliance schedules for total suspended solids (TSS) and total phosphorus limits in individual Wisconsin Discharge Elimination System (WPDES) permits in the Rock River basin. WPDES permits for municipal and industrial wastewater dischargers in the watershed include effluent limitations derived from wasteload allocations established in the July 2011 Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Rock River Basin (TMDL). Permittees have the option to use adaptive management, water quality trading, and other flexible approaches to comply with certain effluent limitations in WPDES permits.

In addition to water quality-based effluent limitations (WQBELs) for TSS and total phosphorus based on TMDL wasteload allocations, each individual permit includes effluent limitations and other conditions to control other pollutants of concern. WDNR uses coordinated individual permits to synchronize compliance schedules for the TMDL-based TSS and total phosphorus limits to facilitate coordination among permittees when implementing the available compliance options.

### Watershed

Rock River, Wisconsin

### Key Water Quality Concerns

Phosphorus and total suspended solids

### Stakeholder Involvement Techniques

- Stakeholder outreach meetings at the basin-wide scale, reach-level, and with individual permittees at the onset of the watershed-based approach.
- Outreach meetings focused on education about the overall approach and the requirements to be included in specific permits.
- Stakeholder involvement in developing adaptive management and water quality trading guidance.

### Case Study Issues of Interest

#### Type of Point Sources



Publicly Owned Treatment Works Discharges



Industrial Process Wastewater Discharges



Industrial Facility Stormwater Discharges

#### Type of Watershed-Based Permit or Approach



Coordinated Individual Permits

#### Highlighted Approach(es)



Implementation of Total Maximum Daily Loads or Other Watershed Pollutant Reduction Goals



Point Source–Point Source Water Quality Trading



Point Source–Nonpoint Source Water Quality Trading

## Background

WDNR issued its Phosphorus Rule in 2010, establishing stringent water quality criteria for total phosphorus. In September 2011, EPA approved a TMDL for total phosphorus and TSS loads in the Rock River basin, one of the first large TMDLs in Wisconsin that established wasteload allocations for point sources. The Rock River TMDL establishes wastewater goals and performance measures that support the use of innovative approaches to improve compliance, encourage innovation, and provide flexibility in achieving water quality standards. These approaches include adaptive management and water quality trading.

Anticipating new or more stringent WQBELs for total phosphorus and TSS resulting from the Phosphorus Rule and TMDL, permittees advocated for a watershed-based permitting approach to provide flexible and equitable compliance options. Some permittees located in reaches dominated by nonpoint sources were interested in point source-to-nonpoint source trading, but were concerned that opportunities to purchase nonpoint source credits would be reduced or unavailable for those whose permits were reissued later than others in the same reach. WDNR recognized that a synchronized permitting approach could address this concern and help facilitate point source-to-point source trading or adaptive management by including those requirements in permits for potential partners at the same time. Other stakeholders, including EPA Region 5 and watershed groups, were also supportive of a watershed-based permitting approach to achieve water quality standards. Environmental groups saw the synchronized permitting approach as a mechanism to encourage adaptive management, which they championed as a viable compliance option to address phosphorus across the entire watershed.

### What is adaptive management?

Adaptive management is a collaborative, watershed-based approach that allows landowners, municipalities, and counties within a watershed to work together to meet phosphorus water quality criteria in the most economically efficient manner. Through this approach, the point sources monitor the watershed for water quality improvement and work with other phosphorus sources to adapt management practices as needed to reduce in-stream concentrations and achieve the water quality criteria.

To facilitate coordination among permittees in the basin, WDNR began issuing coordinated individual permits in 2012 to synchronize compliance schedules for TSS and phosphorus. To manage the administrative burden of issuing or reissuing permits for more than 80 dischargers in the basin, WDNR implemented this strategy in phases over a five-year period. WDNR grouped permits for phased synchronization based on geographic proximity, similar TMDL reaches, and other factors.

As of February 2021, all WPDES permits for facilities subject to the 2011 Rock River TMDL included effluent limits based on the TMDL wasteload allocations. Of these permits, more than 60 percent were in their second term with TMDL-based limits.

The municipal and industrial wastewater permittees included in the synchronized permitting strategy have a variety of options to comply with phosphorus WQBELs. The percentages of current Rock River basin permittees (as of February 2022) that have selected each option are summarized below. Although permittees originally preferred water quality trading over treatment upgrades, some permittees determined that treatment upgrades were economically feasible and could be achieved within the permit compliance schedule. Similar statistics on the selected compliance options are not available for TSS; however, permittees were generally able to meet the TSS WQBELs immediately or comply with them through optimization or upgrades also needed to comply with the phosphorus WQBELs.

- Treatment upgrades and optimization to phosphorus limits at end-of-pipe: 19 percent.
- Adaptive management: 11 percent.
- Water quality trading: 14 percent.
- Multi-discharger water quality standard variance for phosphorus: 11 percent.
- Individual water quality standard variance: 3 percent.
- In planning phase to select the most appropriate compliance strategy: 13 percent.
- Discontinued direct discharges of phosphorus, no limits: 16 percent.
- Meeting limits already: 14 percent.

### Wisconsin's Phosphorus Rule and Statewide Phosphorus Multi-Discharger Variance

In 2010, Wisconsin adopted revisions to its Phosphorus Water Quality Standards. The revisions created maximum phosphorus thresholds for surface waters ([Wisconsin Administrative Code Chapter NR 102](#)), set procedures for implementing the new standards in WPDES permits ([Chapter NR 217](#)), and tightened agricultural performance standards ([Chapter NR 151](#)).

Wisconsin's multi-discharger variance for phosphorus extends the time frame for WPDES permittees to comply with the final effluent limits resulting from the Phosphorus Rule and contributes funds to nonpoint pollution control projects to reduce phosphorus. The variance can cover multiple point sources. Existing facilities that require a major upgrade to comply with their phosphorus limits, and that would be substantially impacted by complying with the standards, are eligible to request a variance. In exchange for the extension, facilities under a multi-discharger variance must comply with interim limits that reduce their phosphorus load each permit term and implement a watershed project to help reduce nonpoint phosphorus sources. The watershed project can be implemented directly by the permittee, through an agreement with a third party, or by making payments to the County Land and Water Conservation Department. The payment amount is based on the difference in phosphorus load between the permittee's monitored discharge and a specified target value. The target value is either the wasteload allocation in an approved TMDL or 0.2 milligrams per liter (mg/L).

## Permit Strategy

The Rock River basin watershed-based permitting approach includes municipal and industrial wastewater treatment facilities with individual WPDES permits. Each permittee covered under this approach receives an individual permit that includes effluent limitations and conditions to control all pollutants of concern in the discharge. These limitations include WQBELs and technology-based effluent limitations (TBELs) based on all applicable requirements and standards. The limits and the permitting process are applied the same as without the watershed-based permitting approach. However, WDNR reissues the permits so that all permittees are on a similar timeline to achieve compliance with TSS and phosphorus limits.

To implement the TMDL, WDNR assembled various sector teams to address different aspects of implementation. The wastewater sector team, including several WDNR engineers, specialists, and permit writers, was responsible for implementing the synchronized permitting project. Rather than attempting to reissue all the permits with the same effective date, the team established a phased approach to synchronizing compliance dates for the TSS and phosphorus limits. This approach helps distribute the workload associated with permitting and public outreach for the 83 industries and municipalities with individual permits. The wastewater sector team grouped permittees in the basin by geographic location within the basin, which was divided into 10 "reach-sheds" containing five to 12 facilities per group. The team planned to synchronize permits for one group each calendar quarter, working from north to south across the basin. The team successfully synchronized all permits by 2017.

Within a group, WDNR reissued each expired permit with a similar set of conditions related to the Rock River TMDL-based wasteload allocations for phosphorus and TSS. The permits included compliance schedules for TMDL-related effluent limits to synchronize compliance time frames among

permittees to the extent possible, given that compliance schedules must be tailored to each permittee. WDNR synchronized the compliance schedules to facilitate coordination within each reach-shed among permittees that wished to use the adaptive management or water quality trading compliance options. WDNR encouraged collaboration among permittees in each group to pool resources and explore joint adaptive management or water quality trading opportunities.

### **Adaptive Management vs. Water Quality Trading**

Adaptive management in Wisconsin is similar to trading in that both involve permittees cooperating with one another or with nonpoint source dischargers to reduce pollutant discharges to the receiving water. However, the two approaches differ in their water quality goals. Adaptive management is focused on achieving water quality criteria, whereas the goal of water quality trading is achieving permit compliance.

#### **Adaptive Management to Achieve Phosphorus and TSS Criteria**

WPDES permittees may participate in an adaptive management strategy to help achieve water quality standards for phosphorus or TSS while minimizing fiscal outlays for in-plant treatment upgrades. The adaptive management approach is available to facilities that 1) discharge to a phosphorus- or sediment-impaired receiving water, 2) must implement filtration or equivalent technology to meet a new phosphorus or TSS limit, and 3) discharge to a receiving water that receives at least 50 percent of phosphorus or TSS contributions from nonpoint sources.

A permittee selecting the adaptive management compliance option must develop and implement an adaptive management plan that identifies actions that will achieve compliance with in-stream water quality criteria for phosphorus or TSS. Permittees may develop the plan on their own or with other partners, such as other WPDES permitted facilities, county conservation agencies, and agricultural and urban nonpoint sources. The plan must establish load reduction goals, specific management measures to achieve the load reductions, metrics for success, and an implementation schedule.

A permittee implementing an adaptive management approach receives less restrictive interim effluent limitations for up to 20 years while optimizing on-site treatment and working with other dischargers to collectively achieve water quality standards.

#### **Water Quality Trading**

Dischargers in Wisconsin may choose to participate in water quality trading to comply with WQBELs in their WPDES permits. WDNR's Water Quality Trading Guidance recommends that WQBELs be developed and provided to permittees up to three years before they become effective to allow permittees to evaluate trading as a compliance option, either through a compliance schedule in the permit or through separate communication with the permittee. Permittees who select trading as their preferred compliance option must establish trade agreements with credit generators or a credit exchange and submit a trading plan to WDNR. The trading plan must quantify the number of credits that will be available from each trading partner. In most cases, the plan must identify where the credits will be generated, the method or practice that will be used to generate credits at each location, a schedule for practice installation or construction, and other information on procedures for quantifying and verifying credits. WDNR reviews the plan to ensure the proposed trading is consistent with applicable requirements and will result in compliance with the permittee's WQBELs, and then issues a permit that includes terms and conditions for trading.

## **Permit Highlights**

WDNR invested significant effort in stakeholder outreach in the early stages of implementation to promote understanding and acceptance of the watershed-based approach among permittees and the public. Over a two-year period, WDNR staff conducted basin-wide meetings and meetings with permittees, both individually and within "reach-shed" groups. Basin-wide meetings included an overview of the TMDL and permits in the watershed. Permittee group meetings included information specific to the reach-shed, with more specific information on individual permits covered in one-on-one permittee meetings. WDNR's goals were to present consistent messages in multiple forums to help permittees and stakeholders understand the approach.

## Permit Components

### Effluent Limitations

The permits included in the watershed-based approach synchronize compliance timelines for TSS and phosphorus effluent limitations. The permits generally include TBELs based on standards established in the state administrative code and WQBELs for TSS and phosphorus based on state standards and Rock River TMDL wasteload allocations. Initial permits under the watershed-based approach have schedules that allow permittees to evaluate and select compliance options and undergo the necessary planning, design, and implementation to achieve compliance with the final effluent limits.

In some cases, the limits established pursuant to the state's administrative rules for phosphorus discharges ([NR 102.06](#) and [ch. NR 217](#), Subchapter III, Wisconsin Administrative Code) are more stringent than those based on the TMDL wasteload allocations. For those permits, the TMDL-based limits might function as interim limits with compliance schedules established to meet the more stringent WQBELs based on state requirements.

Permits for facilities implementing adaptive management must include adaptive management interim limits that are achievable through facility optimization or modest treatment technology upgrades. Adaptive management interim limits may extend through up to four permit cycles, after which a final WQBEL will apply. The final WQBEL may be set equal to the adaptive management interim limit if the receiving water has achieved the applicable water quality criterion.

Permits for facilities implementing water quality trading include language specifically authorizing the use of trading to demonstrate compliance; these permits establish a minimum control level and a compliance schedule. The minimum control level (established to prevent backsliding) could be a TBEL, a limit based on current discharges, or, for phosphorus, an interim WQBEL developed in accordance with state standards. Permits that incorporate water quality trading also include "computed compliance limits" that establish the maximum allowable difference between the amount of phosphorus discharged and the number of credits used.

The following sections describe the effluent limitations in a selection of the permits included in the approach to illustrate the range of possible combinations of applicable requirements and selected compliance options.

### TSS Effluent Limitations

- **Valero Renewable Fuels Company, LLC (WPDES Permit No. WI-0002038-09-0).** WQBELs based on the TMDL wasteload allocation were included in a previous permit. However, TBELs calculated based on current production rates resulted in a more stringent effluent limit, so the TBELs replaced the TMDL-based limits in the current permit.
- **Sharon Wastewater Treatment Facility (WPDES Permit No. WI-0022608-10-1).** The permit includes TBELs established in state regulations and WQBELs based on the TMDL wasteload allocations. The WQBELs are expressed as weekly and monthly averages and the limits vary by month.
- **Lebanon Sanitary District #1 (WPDES Permit No. WI-0031364-08-0).** Like the Sharon permit, Lebanon's permit contains TBELs established in state regulations and weekly and monthly average WQBELs, variable by month, based on the TMDL wasteload allocations. Lebanon's permit, issued March 1, 2020, includes a schedule to construct wastewater treatment system upgrades to achieve compliance with the WQBELs by July 1, 2021.
- **Delafield-Hartland Water Pollution Control Commission (WPDES Permit No. WI-0032026-09-0).** The permit includes seasonal weekly and monthly average concentration-based limits, as

well as load-based weekly and monthly average WQBELs, based on the TMDL wasteload allocations, that vary by month. The seasonal concentration-based limits and the monthly load-based limits apply concurrently.

- **Dane County Regional Airport (WPDES Permit No. WI-0048747-05-0).** The permit includes a TBEL for TSS and a compliance schedule requiring the permittee to implement the Rock River basin TMDL by amending its stormwater pollution prevention plan to address the airport's TSS contribution. The schedule notes that the TMDL specifies percent reduction goals for TSS, but the airport isn't a good fit into any of the source categories identified in the TMDL. Instead, WDNR used state performance standards for stormwater runoff from transportation facilities to establish a goal for a 40 percent reduction in TSS.

## Phosphorus Effluent Limitations

- **Valero Renewable Fuels Company, LLC (WPDES Permit No. WI-0002038-09-0).** The permit includes a TBEL, based on state performance standards, of 1.0 mg/L as a rolling 12-month average. In addition, a compliance schedule provides five months from the permit effective date for compliance with WQBELs, which are expressed as variable monthly average loading limits based on the TMDL wasteload allocations.
- **Sharon Wastewater Treatment Facility (WPDES Permit No. WI-0022608-10-1).** The permit previously included interim limits based on the TMDL wasteload allocation and final limits based on a multi-discharger variance. WDNR modified the permit in 2021 to replace WQBELs based on the variance with final WQBELs based on state standards. The final WQBELs, 0.075 mg/L and 0.161 pounds per day (lbs/day) as a six-month average, become effective in December 2024. The permit modification included a compliance schedule for treatment plant upgrades to meet the interim (TMDL-based) WQBELs by April 2022 and the final WQBELs (based on state standards) by December 2024.
- **Lebanon Sanitary District #1 (WPDES Permit No. WI-0031364-08-0).** The permit includes two sets of WQBELs: monthly loading limits based on the TMDL wasteload allocation and interim limits based on a multi-discharger variance. The permit includes compliance schedules for treatment system upgrades to meet the TMDL-based limits by July 2021. The interim limits based on the variance are effective until July 2023.
- **Delafield-Hartland Water Pollution Control Commission (WPDES Permit No. WI-0032026-09-0).** The permit includes an interim, concentration-based TBEL of 1.0 mg/L as a monthly average based on state standards. The permit also establishes a compliance schedule to complete treatment system upgrades to meet the WQBELs based on TMDL wasteload allocations within three years of permit issuance (by September 2023). The WQBELs are expressed as variable monthly averages and range from 3.22 lbs/day (in October) to 8.58 lbs/day (in April).
- **Madison Metropolitan Sewerage District (WPDES Permit No. WI-0024597-09-0).** The permit includes a TBEL based on state treatment standards of 1.0 mg/L as a monthly average. The permit also establishes an adaptive management interim limit of 0.6 mg/L as a six-month average. The adaptive management plan describes actions that must be implemented, in cooperation with other signatories to the plan, to achieve a 40 percent phosphorus load reduction during the permit term. The permit lists the mass-based WQBELs, based on the Rock River TMDL wasteload allocations, that will become effective after four permit terms. See this [case study](#) for additional information on Madison Metropolitan Sewerage District's adaptive management approach to compliance with the Rock River TMDL wasteload allocations.
- **Slinger Wastewater Treatment Facility (WPDES Permit No. WI-0020290-10-0).** The permit includes WQBELs based on TMDL wasteload allocations, as well as limits that accommodate water quality trading to achieve compliance with a reduced WQBEL based on state standards. The permit establishes a total phosphorus minimum control level of 0.6 mg/L as a monthly average, and "computed compliance" limits for the amount of phosphorus that may be discharged when the

facility uses water quality trading in accordance with its approved trading plan. Those limits are 0.225 mg/L as a monthly average and 0.075 mg/L and 0.94 lbs/day as a six-month average. The permit includes a compliance schedule with milestones for installing nonpoint source management practices (e.g., streambank stabilization) to achieve compliance with the minimum control level and computed compliance limits in the permit.

- **Dane County Regional Airport (WPDES Permit No. WI-0048747-04-0).** Similar to the TSS requirements described above, the permit includes a compliance schedule to amend the permittee's stormwater pollution prevention plan to address phosphorus contributions and establishes a 27 percent phosphorus reduction goal (the calculated phosphorus reduction associated with the 40 percent TSS reduction goal).

## Monitoring and Reporting Requirements

Permits generally require effluent monitoring for TSS and total phosphorus to evaluate compliance with interim and final limits. Permits that incorporate adaptive management require permittees to annually report the results of additional in-stream and effluent sampling and biomonitoring outlined in their adaptive management plan.

Permits that incorporate water quality trading require the permittee to verify proper installation of nonpoint source credit-generating practices by submitting a management practice registration form. Permittees are required to keep records of the credits used each month. Permittees participating in trading must also submit an annual report that includes a confirmation and summary of site inspections to verify implementation of credit-generating practices, changes in management practices and trade agreements, the number and sources of credits used each month, and identification of noncompliance with the permit or approved trading plan. In the fourth year of the permit, the permittee must also submit a revised water quality trading plan if they wish to continue using trading to comply with phosphorus limits in the next permit term. The revised plan must demonstrate that the permittee still needs credits, include a record of compliance with the existing plan, and identify any additional practices needed to maintain compliance.

## Special Conditions

Compliance schedules are used to synchronize the compliance time frames for the TMDL-based TSS and phosphorus effluent limitations. WDNR establishes time frames and compliance milestones to accommodate each permittee's preferred compliance option. For example, a compliance schedule might include milestones for design, construction, and final compliance with the WQBEL for facilities that choose to install treatment upgrades. Compliance schedules for facilities that participate in water quality trading accommodate implementation of the required trading plan, including establishment of nonpoint source management practices that will generate credits.

Permittees who choose the adaptive management option must agree to meet specific permitting requirements to maintain accountability and demonstrate progress toward water quality improvement. These requirements include implementing the adaptive management plan, conducting in-stream and effluent monitoring, complying with adaptive management interim limits, and submitting annual progress reports to WDNR.

Some Rock River permittees are covered under the statewide multi-discharger variance. Those permits require continued performance optimization and implementation of watershed measures to reduce the amount of phosphorus entering the receiving water. The Lebanon Sanitary District #1 (WPDES Permit No. WI-0031364-08-0), for example, elected payment to the county as its approved watershed measure. The permit requires Lebanon Sanitary District #1 to pay the county an amount equal to

\$53.01 per pound times the number of pounds by which the effluent discharged during the previous year exceeded the permittee's target phosphorus value of 0.2 mg/L, or \$640,000, whichever is less.

## Permit Effectiveness

### Environmental Benefits

WDNR anticipates that coordinated permit compliance activities could result in earlier achievement of measurable water quality improvements. Although the rate of water quality improvements varies by reach, WDNR has observed that total phosphorus concentrations have been decreasing at all of the long-term monitoring sites in the watershed.

### Benefits to the Permittee

Synchronizing compliance time frames for permittees in the watershed facilitates partnerships with counties and others and makes it easier for permittees and their partners to target available funding and other resources for shared projects. In addition, permit synchronization in the Rock River basin facilitates the use of adaptive management and water quality trading, which can be more economical compliance options for some permittees. Aligning compliance time frames enables partners in an adaptive management or trading agreement to more easily coordinate the timing of treatment upgrades, nonpoint source investments, and other strategies to reduce pollutant load reductions. According to WDNR's Watershed Permitting Guidance, staff observed that joint permittee meetings and other interactions have encouraged permittees to communicate about sharing limited resources to achieve mutually beneficial compliance projects.

### Benefits to the Permitting Authority

WDNR noted in the Watershed Permitting Guidance that coordination on the Rock River watershed approach led to greater cooperation among its staff. In addition, tools such as permit language and WQBEL templates developed as part of the approach helped streamline permitting activities being done by various staff members.

## Lessons Learned

According to WDNR's Watershed Permitting Guidance, the Rock River watershed-based approach had a negative short-term impact on the permit backlog because some permit reissuances had to be delayed to facilitate synchronization with reach-sheds. WDNR and EPA anticipated and accepted that the backlog would increase in the short term to allow this option to move forward. WDNR had to adjust work planning to support this effort; staff needed additional time to simultaneously conduct compliance inspections, complete WQBEL memos, and conduct public outreach. To compensate for the additional workload, the effort was distributed across central office staff and regional staff. Although WDNR is no longer actively synchronizing permit reissuances by reach-shed, most permits continue to be reissued on a similar schedule since they have similar expiration dates. Some permit reissuances are synchronized as necessary to implement adaptive management, such as for the Yahara Watershed Improvement Network, an adaptive management project led by the Madison Metropolitan Sewerage District. Others may now be on different reissuance schedules because permittees in the reach-shed selected different compliance options or other issues caused delays.



WDNR did not complete a TMDL implementation plan before implementing the watershed-based permitting approach. The agency observed that completing a TMDL implementation plan in advance might have streamlined the permitting process by addressing key permitting decisions, such as how to convert wasteload allocations into permit limits, reallocate wasteload allocations, or implement adaptive management and water quality trading. Further, WDNR suggested that drafting an implementation plan prior to TMDL approval may provide opportunities to adjust the TMDL to facilitate implementation, thereby avoiding increases to the permit backlog upon TMDL approval.

WDNR recommends securing supervisor support for a watershed permitting project during the planning stages of TMDL development to help facilitate consistent communication between wastewater staff, TMDL development staff, and supervisors.

WDNR experienced another challenge in trying to synchronize WPDES permits: some permits needed to be delayed for reasons unrelated to TMDL implementation. For example, some permits were delayed because of the need for water quality standards variances for pollutants not addressed by the TMDL. Other permits were delayed while collecting more accurate information, such as updated stream flow information. In its *Watershed Permitting Guidance*, WDNR recommends that agencies seeking to implement a synchronized permitting approach account for these types of potential delays when developing a watershed permitting plan and that staff work proactively with permittees to resolve these issues. Knowing ahead of time whether these sorts of delays could be significant might help agencies select the appropriate type of watershed permitting approach.

Similarly, WDNR identified the need for a strategy for handling WPDES permits that are not yet expired. In the Rock River basin, WDNR did not revoke and reissue or modify permits to synchronize compliance activities. Instead, compliance schedules would account for the amount of time that had elapsed since adoption of the TMDL. WDNR grouped permits and phased the reissuance of permits within groups to help minimize this issue.

Based on its experience with implementing a watershed permitting approach over a large geographic area and the associated workload challenges, WDNR suggests other approaches may be more appropriate for larger watersheds, such as implementing a group permit (i.e., a multisource watershed-based permit) in lieu of permit synchronization or focusing on a smaller geographic area.

## Resources

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### Pollutants of Concern in Watershed:

TSS and phosphorus leading to algae blooms and habitat degradation