



**Watershed-Based
National Pollutant Discharge Elimination System
(NPDES) Permitting Implementation Guidance**

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SECTION ONE: OVERVIEW

The purpose of this guidance is to describe the concept of and the process for watershed-based permitting under the National Pollutant Discharge Elimination System (NPDES) permit program. Watershed-based NPDES permitting is an approach to developing NPDES permits for multiple point sources located within a defined geographic area (i.e., watershed boundaries). This approach, aimed at achieving new efficiencies and environmental results, provides a process for considering all stressors within a hydrologically defined drainage basin or other geographic area, rather than addressing individual pollutant sources on a discharge-by-discharge basis.

For nearly a decade, the U.S. Environmental Protection Agency (EPA) has supported and encouraged a watershed approach to addressing water quality problems. Awareness and understanding of this approach has grown over time, but with demonstrated gaps in implementation. In December 2002 the EPA Office of Water Assistant Administrator issued a policy memo entitled “Committing EPA’s Water Program to Advancing the Watershed Approach.” This policy memo not only reaffirms EPA’s commitment to the watershed approach but also reenergizes efforts to ensure that EPA as a whole fully integrates the approach into program implementation. The memo calls for the creation of a Watershed Management Council (WMC) that will, among other activities, accelerate efforts to develop and issue NPDES permits on a watershed basis.

Following the release of the December 2002 watershed approach policy memo, EPA’s Office of Water released the “Watershed-Based NPDES Permitting Policy Statement, January 7, 2003.” This statement communicates EPA’s policy on implementing NPDES permitting activities on a watershed basis, discusses the benefits of watershed-based permitting, presents an explanation of the process and several mechanisms to implement watershed-based permitting, and outlines how EPA will encourage watershed-based permitting. It serves as both a formal commitment and a strategy for fully integrating the watershed approach into the NPDES permitting program and accelerating these efforts, as called for in the December 2002 watershed approach policy memo. Appendix A contains both the policy memo on advancing the watershed approach and the watershed-based permitting policy statement.

Although the process of watershed-based NPDES permitting involves a number of key players, the information contained in this implementation guidance targets state regulatory agencies and EPA regional offices that serve as NPDES permitting authorities. The NPDES permitting authorities will need to move the process from concept to implementation. The watershed-based NPDES permitting process also requires the support of the regulated community. Point source dischargers within a watershed will play an active role in the process, assisting NPDES permitting authorities with collecting the information needed to calculate effluent limits and to select the appropriate type of watershed-based permit. The data collection that is an integral part of the watershed-based NPDES permitting process may also provide data for other programs (e.g., statewide monitoring and assessment programs). This guidance discusses some of these coordination and integration issues. It will help point source dischargers understand the process and the role that they can play in the permit program and other water quality programs. Other stakeholders, such as watershed organizations, residents of the watershed community, and entities that contribute nonpoint source pollution are important to the success of the watershed-based permitting process and might also find this implementation guidance useful.

What Is Watershed-Based NPDES Permitting?

As stated above, watershed-based NPDES permitting is an approach to developing NPDES permits for multiple point sources located within a defined geographic area (i.e., watershed boundaries). The primary difference between this approach and the current approach to permitting is the consideration of watershed goals and the impact of multiple pollutant sources and stressors, including nonpoint source contributions. Watershed-based permitting may encompass a variety of activities ranging from synchronizing permits within a basin to developing water-quality based effluent limits using a multiple discharger modeling analysis. The type of permitting activity will vary from watershed to watershed, depending on the unique circumstances in the watershed and the sources affecting watershed conditions. The ultimate goal of watershed-based NPDES permitting, however, is to develop and issue NPDES permits that consider the entire watershed, not just an individual point source discharger.

Why Watershed-Based NPDES Permitting?

Although significant water quality improvements have been made during the past three decades, many remaining water quality problems are a complex mixture of sources and impacts that require integrated, holistic solutions. Based on the 2000 Clean Water Act (CWA) Section 305(b) analysis of the nation's waters, 39 percent of assessed rivers and streams, 51 percent of assessed estuarine square miles, and 46 percent of assessed lake, pond, and reservoir acres (not including the Great Lakes) do not fully support water quality standards. This analysis identifies point source discharges as a contributing factor to water quality impairment in many waters.

Over the past decade, the number of sources subject to the NPDES program has increased almost ten-fold. Given this national picture, there is a pressing need for innovative and efficient solutions to permitting these point sources that will result in further water quality gains. As a mechanism to help integrate other water program activities and to target the most pressing environmental issues within a watershed, a watershed-based approach to NPDES permitting may serve as one innovative tool for achieving new efficiencies and environmental progress. Section Four of this guidance discusses some of these potential benefits, as well as the challenges of watershed-based permitting, in greater detail.

EPA's Office of Water has researched and supported development of the watershed-based NPDES permitting approach throughout the past decade. The 1994 NPDES Watershed Strategy reflects EPA's earliest support, with continued backing for the approach through the Watershed Framework (1996), Effluent Trading in Watersheds Policy (1996), Draft Framework for Watershed-Based Trading (1996), and Water Quality Trading Policy (2003). As stated in the 1994 NPDES Watershed Strategy, "The NPDES program occupies a unique position within the overall water program, since it is both a key customer and an essential partner in supporting other Office of Water program activities and achieving many of our broader water quality goals."

In an effort to move from concept to implementation, EPA is undertaking a number of activities related to researching and analyzing past and current watershed-based NPDES permitting efforts. Experience in watershed-based NPDES permitting is growing through the efforts of some NPDES permitting authorities and watershed organizations. Highlights of existing watershed-based NPDES permits and other related activities (e.g., permit synchronization, statewide basin management) appear throughout this

implementation guidance to provide real-world examples of how the watershed-based NPDES permitting concept and process can translate into practice. Appendix B includes case studies of some existing watershed-based permitting activities. These case studies provide an overview of the watershed, including water quality issues and pollutant sources affecting the watershed. They describe the NPDES permitting issues faced by permitting authorities and the point sources within the watershed, as well as the innovative permitting approach taken to achieve greater environmental results with more efficient use of resources. Many of the lessons learned from previous research, past and ongoing projects, and general watershed management activities provide a basis for this guidance.

How Does Watershed-Based NPDES Permitting Relate to Other Watershed Management Activities?

Understanding the concept and process of watershed-based NPDES permitting requires an understanding of the factors that may influence, and even drive, this approach. All watersheds are influenced by a wide array of management activities related to various regulations, plans, and programs. These activities may include local and/or state watershed management planning, Total Maximum Daily Load (TMDL) development and implementation, water quality trading, water quality standards modification through the triennial review process, and source water protection planning. In some cases, a basic interest among point sources in using a more efficient, cost-effective permitting approach will act as a catalyst for watershed-based NPDES permitting.

Ideally, watershed-based NPDES permitting should be integrated with other existing policies, programs, and permitting processes that influence overall watershed conditions. The National Research Council's 1999 report *New Strategies for America's Watersheds* looked at integration among surface, ground, and drinking water programs, as well as the various agencies that administer them. The findings of this report identified integration as a gap in existing watershed management efforts. A truly comprehensive watershed management approach should bring together key programs under the CWA such as the NPDES Program, the TMDL Program, the Section 319 Nonpoint Source Program, and Section 404 Wetlands Permitting, as well as the Source Water Assessment Program under the Safe Drinking Water Act (SDWA). Watershed-based NPDES permitting can be another tool to facilitate comprehensive

Examples of Driving Factors for Watershed-Based NPDES Permitting

Long Island Sound (CT): A watershed-based general permit for 79 publicly owned treatment works (POTWs) resulted from the creation of a Nitrogen Credit Exchange Program established to achieve a total nitrogen reduction goal in the sound's watershed management plan.

Rahr Malting Company (MN): The individual permit contains a water quality based effluent limitation for biochemical oxygen demand (BOD) driven by a TMDL. It includes provisions allowing the point source to trade impacts of an increase in its discharge from plant expansion with reductions in nonpoint sources of pollution upstream.

South Platte River (CO): Potential changes to the state's selenium water quality standard catalyzed affected point sources to initiate a cooperative data collection effort that will result in site-specific selenium criteria. These criteria will influence permit renewals for several dischargers.

Neuse River Compliance Association (NC): Long-term nutrient impacts led to the development of the Neuse River Basin Nutrient Sensitive Waters (NSW) Management Strategy, which establishes specific nutrient control requirements for point source dischargers in the basin. The strategy allows dischargers to form a group compliance association that can work together to meet their combined total nitrogen allocation.

programmatic integration at a watershed level and ensure that permitting activities tie into existing watershed management efforts. Below are brief descriptions of how watershed-based NPDES permitting may link to other programs and activities that influence watershed management.

Statewide Rotating Basin Planning Approach

The desire to better coordinate federally delegated programs under the Clean Water Act has led several states to develop and implement a statewide rotating basin planning approach. Under this approach, the applicable state agency delineates watershed boundaries within the state and groups them into basin management units. After delineating the basin management units, states then implement a watershed management process according to a statewide rotating schedule. The process, which varies in each state, is generally comprised of five activities: 1) data collection and monitoring, 2) assessment, 3) strategy development, 4) basin plan review, and 5) implementation (EPA 2002).

States stagger this process on a rotating basis, usually on a five-year cycle. During the first year, step one will take place in a particular basin management unit. In the second year, step two will take place in the initial basin and step one will take place in another basin. This statewide rotating basin planning approach could generate the data required to feed the watershed-based NPDES permitting approach. States that use this approach are more likely to have stakeholders that are aware of watershed concepts and feel comfortable with the idea of developing and implementing a permitting approach for their basin management unit. A statewide rotating basin planning approach can serve as a strong foundation for watershed-based permitting activities.

Permitting According to the 5-Year Plan: State Examples of Permit Synchronization

Michigan - Michigan's NPDES permit backlog elimination plan includes basinwide permit reissuance as a key element. Established in 1983, this five-year approach allows the state to reissue approximately 20 percent of NPDES permits each year. Benefits of this approach include coordination with NPDES support activities such as monitoring and inspections. While this approach works well for reissuing individual permits, the rotating basin approach is challenging for the reissuance of general permits (MDEQ 2002).

North Carolina - Established a statewide watershed management approach as a way to streamline NPDES permitting and integrate permit reissuance with water quality modeling at a watershed level. By 1998, the 17 river basins within the state had basin plans in place using a five-year development process. During the five-year period the state coordinates activities such as monitoring, modeling, TMDL development, nonpoint source planning, and NPDES permit limit development (EPA 2002).

Ohio- Permitting was originally based on priority, until 1990 when this activity became a part of the five-year rotating basin plan. In doing so, the state synchronized permitting with basin monitoring activities. This allowed the state to use basin monitoring data and comprehensive water quality reports when developing new permits. Basinwide synchronization is now carrying over to TMDL development; the state is attempting to develop TMDLs for all listed segments within a watershed at the same time (EPA 2002).

Washington - Recommendations of a Washington State legislature "efficiency commission" contributed to the development of Washington's statewide watershed framework. The state stresses that statewide coverage is ensured by scheduling water quality management areas, not prioritizing them. Permitting occurs during the implementation phase in the last year of the five-year process. One of the lessons learned through this approach is "targeting issues for treatment each cycle provides focus" (Ecology 2003).

Permit Synchronization

States have recognized the benefits of administering programs using a systematic approach based on defined basin management units, as described under the statewide basin planning approach, and have applied this approach to synchronize the issuance of NPDES permits. Synchronized permit issuance can lead to improved technical analysis, and therefore, more equitable NPDES permits. In addition, permit synchronization can result in administrative efficiencies, such as less travel time for monitoring and inspections (EPA 2002). Although permit synchronization on a basinwide basis does not ensure that permit limits will take watershed conditions into consideration, it is a significant watershed-based NPDES permitting activity that many states currently implement. With this activity in place, states have a strong foundation for moving to watershed-based NPDES permit limits and other watershed-based permitting efforts.

Watershed Management Planning

Watershed management planning is an iterative process of goal-setting, data collection and analysis, problem identification, strategy development and implementation, and evaluation. This process, with meaningful stakeholder participation, is often the overarching management tool for achieving watershed goals. The watershed-based NPDES permitting approach can advance the goals established within a watershed management plan by providing a mechanism for coordinating control activities and data collection activities. In addition, it can provide a vehicle for public participation, or for communicating the goals of the watershed management plan.

Not every watershed has a management plan that coordinates existing activities and information. In the absence of an existing watershed management plan, the watershed-based NPDES permitting process can initiate a broader dialogue about watershed goals, data needs, and possible pollutant control strategies. Developing permits provides a single mechanism for gathering much of the data necessary for watershed plans. As stakeholders gather and analyze data necessary to develop the watershed-based NPDES permit, portions of the watershed management plan will begin to take shape and additional stakeholders may join the process.

Total Maximum Daily Load Development and Implementation

There is a strong link between watershed-based NPDES permitting, TMDL development and implementation, and watershed management planning. Water quality impairments leading to 303(d) listings

The 303(d) List and TMDLs

It Starts with Standards . . .

Every waterbody has a set of water quality goals known as water quality standards. These standards, developed by states, identify the uses for each waterbody and the scientific criteria to protect that use.

Impairment Leads to Listing . . .

Waters that do not meet water quality standards are considered impaired. Section 303 of the CWA requires states to include impaired waters on a list referred to as the 303(d) list. States must develop TMDLs for impaired waters on the 303(d) list.

Meeting Allocations to Attain Standards . . .

A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. Once the state calculates that maximum amount, smaller pieces of the TMDL pie (i.e., allocations) are made to pollutant sources. Both regulatory and voluntary actions by point and nonpoint sources are necessary to successfully implement a TMDL and achieve water quality standards.

and TMDL development often drive watershed management planning. Many of the actions necessary for a successful TMDL are also needed for a successful watershed approach. Therefore, common data needs between the TMDL approach and watershed approach should be considered in watershed plans and reflected in NPDES permits developed on a watershed level.

Section 319 Nonpoint Source Management Program

One of the most challenging aspects of watershed management is effectively reducing nonpoint sources of pollution. Nonpoint source pollution is runoff from diffuse sources such as agricultural, construction, forestry and urban areas that are not required to obtain NPDES permit coverage. Point sources within a watershed have NPDES permits to regulate effluent discharges. This type of regulatory mechanism does not exist for nonpoint sources. Instead, nonpoint sources participate in watershed management efforts on a voluntary basis. Funding for best management practices to control nonpoint source runoff often provides an incentive for nonpoint sources to actively engage in watershed management. Given the impact nonpoint sources may have on a watershed, and the voluntary nature of nonpoint source controls, it is imperative that stakeholders representing nonpoint source issues and interests actively participate in watershed management activities from the outset.

Each year, EPA allocates funds to states with approved Nonpoint Source Assessment Reports and Nonpoint Source Management Programs under section 319(h) of the Clean Water Act. States can use these funds to implement programs and projects designed to reduce nonpoint source runoff, including nonpoint source TMDLs, ground water protection activities and abandoned mine land reclamation projects. EPA's recent supplemental guidelines for section 319 grant funds require that watershed-based plans for impaired waters developed using these funds address nine critical elements. One of these critical elements is to provide an estimate of load reductions expected from best management practices to achieve goals in the watershed-based plan (EPA 2002).

The goals and requirements of the section 319 grant program can play a key role in watershed-based permitting. No matter how stringent permit requirements are for point sources, conditions in some watersheds will simply not improve without reductions in nonpoint source pollutant contributions. Without a regulatory mechanism, the funding provided through the section 319 grant program may play a significant role in achieving necessary nonpoint source pollutant reductions. The analysis of pollutant sources and loadings conducted through watershed-based permitting may aid nonpoint sources in developing watershed-based plans that include the necessary loading reduction information, ultimately easing the burden on nonpoint sources to obtain grant funding under the new supplemental section 319 grant requirements. Where watershed-based plans with expected load reductions exist, these plans could have an important impact on aspects of watershed-based permitting, such as development of new permit limits for point source dischargers in the watershed.

Water Quality Trading

Water quality trading and watershed-based NPDES permitting also have close connections. To facilitate water quality trading, it is necessary to quantify tradable units such as pollutant loads and load reductions. States can then develop procedures for using tradable credits in NPDES permits.

The permits and effluent limits developed to facilitate a water quality trading program might form the basis for watershed-based NPDES permitting. In some cases, watershed-based NPDES permit development might lead to the creation of a water quality trading program.

Source Water Protection Planning

Through the Source Water Assessment and Protection (SWAP) Program under the SDWA, states are conducting assessments of the existing and potential threats to public water supplies by delineating source water protection areas (also referred to as protection zones), conducting contaminant source inventories, and determining the susceptibility of the public water supply from the inventoried sources. Operators of public water systems can then take this information and develop source water protection strategies, in which watershed-based NPDES permitting may play a role. NPDES permitting authorities consider the proximity of point sources to surface water intake structures when developing permit limits. For example, to decrease risk, permit writers might generate more stringent permit limits for all point sources located in the source water protection zone closest to surface water intake structures than for those located in the protection zone farthest from the intake structures.

What Does This Implementation Guidance Contain?

This guidance focuses on defining both the general approach and the process for watershed-based NPDES permitting. The guidance addresses issues related to program implementation, but it does not provide detailed technical information or address procedural and administrative actions related to permit issuance. Those will be covered in future guidance documents. An overview of each section is provided below.

- ◆ Section Two describes EPA's recommended process for watershed-based NPDES permitting. This process is presented in six steps.
- ◆ Section Three describes the anticipated benefits and challenges associated with taking a watershed-based approach to NPDES permitting. Where related case study information is available, EPA has included it to illustrate the potential benefits and challenges of watershed-based NPDES permitting.
- ◆ Section Four looks ahead to the future of watershed-based permitting and provides a series of resources and references.

SECTION TWO: DEVELOPING AND IMPLEMENTING A WATERSHED-BASED NPDES PERMITTING APPROACH

This document serves as an initial road map for those interested in taking a watershed-based approach to NPDES permitting. The basic components of a watershed-based permit and many of the key steps in developing a watershed-based permit are similar to those for individual NPDES permits, but are developed for the entire watershed and all of its sources rather than individual point sources. Much of the process is similar to what is involved in developing a TMDL for a waterbody.

Because the term *watershed approach* refers to a process that is unique and site-specific, NPDES permits developed using a watershed approach will not look the same in any two watersheds. Given the need for customization at the watershed level, this section presents a general process for developing NPDES permits that permitting authorities, point source dischargers, and other key stakeholders can use as a starting point. EPA intends for stakeholders to tailor this process as appropriate to fit the needs and circumstances within a specific watershed.

The remainder of this document makes the assumption that watershed-based permitting is happening throughout a state on a select case-by-case basis, rather than on a statewide level, either in state-defined basin management units or in locally-defined watersheds. EPA’s suggested process for developing and implementing a watershed-based NPDES permitting approach consists of the following six steps:

- Step One** – Select a Watershed and Determine Boundaries
- Step Two** – Identify Stakeholders and Facilitate Their Participation
- Step Three** – Assess Water Quality Conditions of the Watershed; Collect and Analyze Data for Permit Development
- Step Four** – Develop Watershed-based Permit Conditions and Documentation
- Step Five** – Issue Watershed-based NPDES Permits
- Step Six** – Measure and Report Progress

Each step is discussed in more detail below. As mentioned earlier, NPDES permitting authorities will likely initiate and facilitate this process; therefore, the watershed-based permitting process primarily addresses this audience. However, highlighted text entitled “Where Do I Fit In?” appears throughout the process description, providing specific information to other stakeholders (e.g., permittees and watershed organizations) about the role they can play at certain points in the process.

Step One: Select a Watershed and Determine Boundaries

Selecting geographic boundaries of the watershed is an important first step. The

What Is a Watershed?

A watershed is an area of land where all of the water that is under it or drains off of it goes into a common waterway, such as a stream, river, lake, estuary, or ocean. Watershed boundaries can transcend local, state, and national political boundaries.

The U.S. Geological Survey (USGS) delineates watersheds in the United States using a nationwide system based on surface hydrologic features. This system divides the country into 21 regions, 222 subregions, 352 accounting units, and 2,262 cataloging units. These hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). The USGS identifies each hydrologic unit by a unique HUC consisting of 2 to 8 digits based on the four levels of classification in the hydrologic unit system.

Regions contain either the drainage area of a major river, such as the Missouri region, or the combined drainage areas of a series of rivers, such as the Texas-Gulf region, which includes a number of rivers draining into the Gulf of Mexico. The Missouri region (2-digit HUC 10) covers more than 500,000 square miles and all or parts of 10 states and numerous tribal reservations. An example of a subbasin within the Missouri region is the Lower Yellowstone River subbasin in Montana and North Dakota (8-digit HUC 10100004). This subbasin covers 5,416.8 square miles.

process for watershed-based NPDES permitting can draw upon the experience of other programs and activities, such as TMDL development or other activities described in Section One of this document (see “How Does Watershed-based NPDES Permitting Relate to Other Watershed Management Activities?”). If NPDES permitting authorities are looking for an appropriate watershed in which to start the watershed-

**When Considering Watershed-Based NPDES Permitting,
Consider This . . .**

- ◆ Does the state regulatory agency manage water resources on a watershed basis?
- ◆ Are data available to characterize the pollutant sources and overall condition of the watershed?
- ◆ Are point source dischargers located within the watershed interested in or currently seeking innovative approaches to pollution control?
- ◆ Is there a desire to pursue a watershed approach to achieving watershed goals by major stakeholders?
- ◆ Is there a watershed management plan in place or under development for the watershed?
- ◆ Do watershed stakeholders have local goals set for the watershed?
- ◆ Does the watershed contain a local watershed organization? If so, does the organization perform key functions such as stakeholder education and outreach, monitoring, data management, or water quality modeling? Do watershed stakeholders have local goals set for the watershed?
- ◆ Is there a single entity that controls multiple point sources within the watershed?
- ◆ Are any of the waters within the watershed impaired and listed on the state’s 303(d) list? (Do they require TMDL development?)
- ◆ Is there an approved TMDL?
- ◆ Are NPDES permits within the watershed scheduled for reissuance in the near future? Do any of the expiration dates fall closely together?
- ◆ Does nonpoint source pollution impact watershed conditions as well as point source discharges?
- ◆ Are there sources of drinking water located within the watershed that have, or will have, a source water protection plan?

based permitting process, watersheds with these activities and programs in place may make good candidates. The list of questions contained in the box below may also help NPDES permitting authorities determine if a particular watershed is appropriate for this approach. Watershed boundaries will influence the scale and scope of every aspect of the process, particularly activities related to stakeholder involvement and data collection. The physical characteristics of the area and the jurisdictional limits affect the process for defining the boundaries of a watershed. As watershed boundaries expand, the scope of complexities such as multijurisdictional issues, data collection and management, stakeholder involvement, and funding will expand as well. Those initiating the process for watershed-based NPDES permitting should keep these factors in mind when defining watershed boundaries. The watershed should be of a manageable size to allow for integration and coordination of water quality program activities with the permitting process.

Appropriate boundaries for watershed projects often depend on site-specific circumstances and the overall goals of the project. For example,

- ◆ States that use a watershed management approach for conducting assessments and prioritizing actions typically delineate water resources using hydrologic unit codes or HUCs (see text box, “What is a Watershed?”). The term *basin* typically refers to watersheds that have 6-digit HUCs and *subbasin* to watersheds that have 8-digit HUCs. These smaller watersheds may be well suited for activities such as synchronizing permitting, coordinating permitting with other activities such as monitoring, or developing a permit that covers multiple sources within the basin or subbasin.
- ◆ Some metropolitan sewer districts have organized according to watershed boundaries, but these boundaries may include only portions of HUCs that fall within the district’s service area boundary. This type of watershed delineation, driven by a combination of natural and jurisdictional boundaries, reflects how project goals can determine the appropriate scope of a project.
- ◆ Through the source water protection program, states have created rules for delineating protection zones for surface water and ground water sources. These rules incorporate a prioritization scheme based on potential for source water contamination within natural watershed boundaries. As a result,

**WHERE DO I FIT IN?
Selecting and Determining
Watershed Boundaries**

If you are the NPDES Permitting Authority, you can

- ◆ Identify watersheds with existing watershed-based programs and efforts to build upon.
- ◆ Provide information to other stakeholders on the watershed delineations that the state uses to manage water resources.
- ◆ Present other watershed delineation options to participating stakeholders for consideration.

If you are a point source, you can

- ◆ Develop options for delineating watershed boundaries.
- ◆ Provide information on how the local community views the watershed.
- ◆ Comment on watershed boundary options presented by the permitting authority.

If you are a non-NPDES stakeholder, you can

- ◆ Suggest watershed delineation options.
 - ◆ Share information about existing watershed efforts and the boundaries in which they operate.
-

management approaches become more intensive zone by zone based on proximity to drinking water sources within the overall watershed boundary.

As in the examples above, the drivers for watershed-based NPDES permitting may help to establish watershed boundaries. In some watersheds, TMDL development may serve as the impetus for watershed-based permitting. In others, comprehensive watershed management planning may emphasize the necessity for a watershed approach to permitting. The watershed boundaries established through these projects may serve as a good starting point for determining the most appropriate boundaries for watershed-based NPDES permitting. As the permitting process moves forward, permitting authorities may adjust watershed boundaries to reflect the concerns of other stakeholders in the process or a desire to narrow or broaden the scope of watershed-based permitting activities.

Step Two: Identify Stakeholders and Facilitate Their Participation

Successful watershed management efforts require identifying and involving the key players, or stakeholders, that should participate in the process from the outset because they influence and are affected by watershed decisions. Early and continuous stakeholder involvement can garner stakeholder participation and support on potentially contentious decisions. Meaningful stakeholder involvement can produce stakeholders that have ownership over the process and feel empowered. This is important, to guarantee implementation of the outcomes of this potentially resource-intensive stakeholder negotiation process. Stakeholder involvement is particularly important in watershed-based permitting where sustained voluntary participation of nonpoint sources may be the key to meeting water quality goals, regardless of the watershed-based permit limits reflected in NPDES permits for point sources.

Identifying Stakeholders

For watershed-based NPDES permitting, there are two categories of stakeholders to consider: NPDES stakeholders and non-NPDES stakeholders. The category referred to as NPDES stakeholders includes those directly involved in the NPDES permitting process, which in most cases are the NPDES permitting authority (i.e., NPDES program managers and permit writers from the state environmental regulatory agency or EPA regional office) and NPDES permittees. Other NPDES stakeholders might include other state agency and EPA regional staff who are working directly in the watershed and have access to important data and information (e.g., watershed coordinators, TMDL program staff, source water protection program staff).

The category referred to as non-NPDES stakeholders includes other key watershed stakeholders that are not directly involved in the NPDES permitting process but that affect, or are affected by, the overall condition of the watershed. Stakeholders within this category may include active local watershed organizations, entities that contribute nonpoint source pollution, and residents. The NPDES permitting authority and a few of the point source dischargers most likely will initiate and facilitate the watershed-based permitting process.

The list of stakeholders that should participate in a watershed-based permitting process will vary from watershed to watershed. Identifying and involving stakeholders is an iterative process. Initially, the list of both categories of stakeholders should be comprehensive, representing all interests at the federal, state, and local levels. As an understanding of the watershed, the water quality conditions, and the sources

affecting water quality develops, permitting authorities will gain a better understanding of who is interested in actively participating. As a result, the list of participating stakeholders might shrink or expand as the process moves forward.

As with all watershed projects, this approach will prove most successful if key stakeholders at the local level (i.e., NPDES permittees) are involved in initiating the process and providing leadership throughout. Point sources who disengage from, or never become engaged in the watershed-based permitting process, will still be permitted, but their lack of participation has consequences. These permittees may still have watershed-based permit limits and conditions, but their negotiation power through the watershed-based permitting process will be significantly limited. For example, point sources not involved in the process will be on their own to appeal to the permitting authority if they are concerned about how permit limits are calculated or what type(s) of permit is issued to cover their discharges. Also, their lack of participation will limit the effectiveness of any group effort within the watershed, such as a trading program or monitoring consortium. It is also essential, of course, that the NPDES permitting authority (both permit writers and managers) provide early buy-in to ensure that the watershed-based permitting approach is feasible and will produce the desired outcomes—effective watershed-based permits.

Other important stakeholders can also affect the NPDES permitting process. Nongovernmental organizations, such as watershed groups and other environmental nonprofit groups, often get involved in NPDES permitting activities by providing comment on draft permits, conducting water quality monitoring activities, and educating the public on water quality and wastewater issues. Federal agencies active in watersheds, such as the National Park Service and the USGS, are important partners to invite into the

Types of Stakeholder Involvement In Watershed-Based NPDES Permitting

NPDES Stakeholders

Who Are They?

- ◆ NPDES permitting authority
- ◆ EPA
- ◆ Municipalities
- ◆ POTWs
- ◆ Industrial facilities
- ◆ Developers
- ◆ Concentrated Animal Feeding Operations (CAFOs)
- ◆ Other watershed-related staff (e.g., EPA, state, or tribal TMDL program staff, state and tribal water quality standards staff, state or tribal watershed coordinators)

What Role Do They Play?

- ◆ Initiate the process
- ◆ Facilitate the process.
- ◆ Identify other stakeholders
- ◆ Provide technical direction for the process
- ◆ Educate non-NPDES stakeholders on NPDES issues
- ◆ Contribute data and information
- ◆ Provide input on the technical process

Non-NPDES Stakeholders

Who Are They?

- ◆ Agricultural interests
- ◆ Local watershed organizations
- ◆ Residents
- ◆ Businesses
- ◆ Universities
- ◆ Federal agency partners
- ◆ State agency partners
- ◆ Local planning organizations
- ◆ Local health departments

What Role Do They Play?

- ◆ Contribute data and information
- ◆ Provide input on the technical process
- ◆ Educate other watershed stakeholders
- ◆ Implement additional solutions to control other watershed stressors

process. Even if these agencies are not NPDES permittees within the watershed, they may conduct activities important to the overall process, such as data collection, public education, or land management.

Although not directly affected by the NPDES program, stakeholders contributing nonpoint source pollution to the watershed should receive an invitation to participate in the watershed-based permitting process. This group may include local farmers, municipalities, residents, businesses, schools, universities, and developers. As stated above, the types of nonpoint sources affecting the watershed will become more clear with additional data and information. If new information reveals that other stakeholders impact, or are impacted by, watershed conditions, they should also be invited to participate in the process. Stakeholders contributing nonpoint source pollution to the watershed may play a critical role in achieving overall loading reductions of pollutants of concern. As stakeholders in the watershed-based permitting process, they will learn about the watershed and their impact on water quality and be able to provide their input on watershed goals. Their involvement increases the chances for successful voluntary measures for nonpoint source pollutant reductions and for participation in any trading program within the watershed.

Throughout the process of watershed-based NPDES permitting, each type of stakeholder will play a specific role and have certain responsibilities. Many of these roles and responsibilities are not dictated by whether the stakeholder falls into a specific category, but rather by each stakeholder's area of expertise, available resources, and jurisdictional authorities. Roles and responsibilities of significant stakeholders are defined below.

U.S. Environmental Protection Agency

While EPA is an important stakeholder in the permit development process, it will not initiate the process unless it is the NPDES permitting authority (see below). EPA's role will include providing technical assistance to the permitting authority, providing educational background on the permitting process to all stakeholders, providing direction regarding compliance with CWA and other regulatory requirements, and serving as a facilitator for the stakeholder group as needed and requested. EPA also plays an important oversight role where the state agency is the NPDES permitting authority.

NPDES Permitting Authorities

The NPDES permitting authority plays the central role in watershed-based permit development. It ultimately has the responsibility for leading permit negotiations, including determining the appropriate type of permit to develop and issue; identifying eligible sources; and setting appropriate permit limits, monitoring requirements, and other permit conditions. The permitting authority may initiate the watershed-based permitting process within a particular watershed or may respond to the initiative of one or more point sources or other stakeholders. In either case, support from the permitting authority for both the concept of watershed-based permitting and the specific process used to develop the permit is essential.

The permitting authority will need to work closely with EPA to identify and address potential regulatory challenges and technical issues associated with developing an NPDES permit on a watershed basis. It will also play the important role of identifying and involving both categories of stakeholders, including those that contribute nonpoint source pollution, and working with those stakeholders to customize the permit development process to the specific watershed. Finally, the permitting authority will have the primary role in defining and measuring success of the watershed-based permitting effort.

Point Sources

As the other major player in all permit negotiations, point sources must support the watershed-based permitting concept and process for it to be successful. Point sources will work with the NPDES permitting authority to customize the permitting process for the watershed, calculate appropriate permit limits, and develop other suitable permit requirements (e.g., comprehensive, integrated reporting and monitoring). In addition, point sources should be encouraged to assist the permitting authority in identifying other key stakeholders, as well as engaging other point source dischargers within the watershed who initially elect not to participate.

Point sources play an important role in collecting and managing facility-specific and watershed-level data. They should also help the permitting authority define measures of success for the watershed-based permit. Monitoring conducted by point sources will help track progress toward these goals.

Other Watershed Stakeholders

Other watershed stakeholders, such as active local watershed organizations, nonpoint sources, state and local agencies, universities and residents, will have a role in educating the permitting authority, EPA, and point sources about specific local watershed issues and concerns. They may also help set goals for the permitting process and provide input on how the process should be tailored to the specific watershed.

As the permit is developed, these stakeholders may be a source of important watershed-level data or may engage in data collection to help fill any gaps. They may also be called upon to serve as a facilitator, provide technical expertise (such as modeling), or identify and implement additional non-NPDES solutions to help achieve water quality goals.

Facilitating Participation

Although stakeholder participation is listed here as one of the early steps in this overall process, it is not a discrete step. Early and continuous stakeholder involvement is essential to the success of any watershed

WHERE DO I FIT IN? Identifying Stakeholders and Facilitating Their Participation

If you are the NPDES Permitting Authority, you can

- ◆ Generate a list of potential stakeholders within the watershed and convene a new group.
- ◆ Identify existing watershed organizations and ask to attend their meetings to recruit stakeholders or educate stakeholders on watershed-based permitting.
- ◆ Identify representatives from stakeholder groups and request assistance in identifying other stakeholders.

If you are a point source, you can

- ◆ Identify other stakeholders that may have an interest in participating in watershed-based permitting.
- ◆ Lead the effort to initiate a group of stakeholders and approach the permitting authority with a proposal.
- ◆ Learn about the approach and present information to local groups that have potential stakeholders as members.

If you are a non-NPDES stakeholder, you can

- ◆ Invite the permitting authority to speak at a meeting attended by possible stakeholders to the process.
 - ◆ Share information with the permitting authority about other possible stakeholders.
 - ◆ Develop and present information on watershed-based permitting to other potential stakeholders to gauge interest in the approach.
-

approach. EPA envisions that stakeholders' actions will fuel the entire process and that every step will include some aspect of stakeholder involvement.

To help guide the stakeholder group throughout this process, identifying a facilitator may prove advantageous. A facilitator can develop and enforce guidelines for participation in any stakeholder meetings, ensure that all interests are heard, assess stakeholders' degree of understanding of the process and technical details of watershed permitting, and identify points of contention that impede the process and help the group to work through them.

After identifying the initial stakeholder group and the appropriate facilitator, it is essential to conduct a few very basic activities: (1) educate stakeholders on the concept of watershed-based NPDES permitting and obtain their support for this approach, (2) provide stakeholders with background information and known data on the condition of the watershed, and (3) obtain input from stakeholders on both the concept of watershed-based permitting and the factors impacting implementation in their watershed.

The stakeholder group could serve as the collective decision-making body for some aspects of the watershed-based NPDES permitting effort (e.g., goal setting) or as a group that simply provides advice and guidance to the permitting authority. Given the various backgrounds, interests, and areas of expertise that will exist among the group, it is important that everyone has a general understanding of the NPDES program and the watershed-based NPDES permitting concept. The NPDES permitting authority or a representative from EPA should provide the group with this information. In addition, the permitting authority may want to compile readily available information about the health of the watershed (e.g., existing watershed management plans, state 305(b) reports, volunteer monitoring information) to provide stakeholders with an introduction to the water quality issues in the watershed.

Watershed Stakeholders Planning for Action

It took nearly three years and consensus from a 120-member Watershed Action Team to develop a watershed action plan to restore the Elizabeth River watershed in Virginia. The plan, sponsored by the Elizabeth River Project, identifies 18 action items that reflect the concerns and priorities of the local watershed stakeholders.

Action items that could influence a watershed-based permitting effort include reducing toxics and nutrients in storm water runoff, establishing a monitoring program and data bank, and supporting efforts to implement a load allocation approach as a voluntary approach to watershed management (Elizabeth River Project 2002).

Once the members of the stakeholder group have reviewed basic information about the watershed and the concept of watershed-based NPDES permitting, they can then begin to examine the approach and consider ways to customize this approach for their watershed.

Step Three: Collect and Analyze Data for Permit Development

As with development of any NPDES permit, the permitting authority developing a watershed-based permit needs to collect and analyze data on receiving water standards and goals, receiving water characteristics, and sources of pollutants to the waterbody. These data will be used as inputs for water

quality models that will assist the permitting authority in establishing appropriate requirements in the watershed-based permit. Because a watershed-based permit addresses multiple sources within the watershed, this data collection and analysis process will be similar to that used in developing TMDLs for impaired waterbodies. Data collection and analysis for watershed-based permitting, however, is further complicated by the fact that the analysis may not only address multiple sources, but also multiple pollutants. This section lists questions that stakeholders should consider when conducting initial data collection and analysis, and lists potential sources for those data.

Receiving Water Standards and Goals

- ◆ What are the applicable water quality standards?
 - Designated uses
 - Numeric criteria (including magnitude, duration, and frequency) and narrative criteria
 - Antidegradation policy and implementation procedure
- ◆ Are water quality standards scheduled for review or have changes to water quality standards been proposed?
- ◆ Is there a variance to existing water quality standards?
- ◆ What are the critical conditions under which the water quality standards apply (e.g., low flow)?
- ◆ Are there different water quality standards provisions that apply under different critical conditions (e.g., low flow vs. peak flow conditions)?
- ◆ What is the state or tribal mixing zone policy?
- ◆ Is there a TMDL or watershed plan?
- ◆ What other goals, in addition to water quality standards, have stakeholders identified?
 - Water quantity
 - Endangered species habitat protection
 - Drinking water source protection
 - Green space protection
 - Recreation

Identifying Pollutant Hot Spots: Selenium Stakeholders Case Study

Members of the Selenium Stakeholder group in Colorado work together to collect information on the sources of selenium in the South Platte River watershed. Through their monitoring efforts, the Selenium Stakeholder group has identified “hot spots” of selenium and traced these elevated concentrations upstream to nonpoint sources within the watershed. By collaboratively monitoring, the Selenium Stakeholders group revealed important information about upstream selenium concentrations that the state would use as background concentrations in calculating permit limits. The comprehensive data set generated by the group will contribute to the development of a site-specific selenium criterion that will impact future permit limits.

Working as a consortium of watershed point source dischargers allowed members of the Selenium Stakeholder group to generate a significant amount of data while leveraging their resources. The result was a larger data set to support the goals of all point source dischargers at a lower cost to each member (Congram et al. 2002).

- ◆ Have the stakeholders identified any water quality goals that should be modified (e.g., through a use-attainability analysis)?

Sources:

- ◆ State or tribal water quality standards.
- ◆ Use attainability analyses for water quality standards.
- ◆ Approved TMDLs.
- ◆ State, tribal, or local watershed plans.
- ◆ State, regional, tribal, or local ordinances, authorities or initiatives.
- ◆ Stakeholder meeting decisions or other input about water quality goals (e.g., meeting minutes, watershed group planning documents).

Receiving Water Data

- ◆ Is the receiving water meeting water quality standards?
- ◆ What are the characteristics of the receiving water under critical conditions (e.g., low or high flow, temperature, pH, hardness)?
- ◆ What unique issues related to overall water quality should be considered in the permitting process (e.g., endangered species, historic preservation)?

Sources:

- ◆ CWA 305(b) reports.
- ◆ CWA 303(d) listings of impaired waters.
- ◆ TMDL analyses.
- ◆ State, tribal, or local watershed plans.
- ◆ USGS stream data (flow, water quality).
- ◆ EPA, state, or tribal monitoring data (e.g., STORET).
- ◆ Discharge Monitoring Reports.
- ◆ Environmental Impact Statements.

WHERE DO I FIT IN? Collecting and Analyzing Data for Permit Development

If you are the NPDES Permitting Authority, you can

- ◆ Collect all relevant data available at the state level and identify data gaps.
- ◆ Initiate process for assessing data availability among watershed stakeholders.
- ◆ Identify strategy for addressing existing data gaps and present strategy to stakeholder group.

If you are a point source, you can

- ◆ Share existing data from ongoing monitoring efforts.
- ◆ Initiate a monitoring consortium with other point and nonpoint sources.
- ◆ Contribute resources to fill data gaps.

If you are non-NPDES stakeholder, you can

- ◆ Organize a volunteer monitoring program with input from the permitting authority to collect data.
 - ◆ Share existing data from ongoing monitoring efforts.
 - ◆ Write a grant proposal to obtain funds for a watershed monitoring program.
-

- ◆ Federal and state endangered species and historic preservation laws.
- ◆ Special studies by regulatory authorities, point sources, or other agencies (e.g., U.S. Fish and Wildlife Service).

Pollutant Source Data

- ◆ What point sources are located within the watershed and where are they?
- ◆ What nonpoint sources are located within the watershed and where are they?
- ◆ Are there major pollutant sources originating outside the watershed (e.g., upstream sources, air deposition)?
- ◆ What loading of each pollutant of concern is contributed by each source?
- ◆ How are loadings transported to and within the watershed?

Sources:

- ◆ Federal, state, or local geographic information system layers (e.g., point source layer, land use layer).
- ◆ Permit applications.
- ◆ Discharge Monitoring Reports.
- ◆ Special studies conducted by the discharger (e.g., mixing studies).
- ◆ Nonpoint source loading estimates from modeling.

Some or all of these data would be used to establish NPDES permit conditions for point sources in the watershed. At this stage of the process, the NPDES stakeholders initiating the process may decide it is appropriate to change the scope of the watershed-based permitting effort. For example, based upon an analysis of existing water quality, the watershed-based permit might be tailored to focus on a single pollutant or a few critical pollutants of concern for which there are a number of sources in the watershed. Or, stakeholders might analyze data on sources and determine that the watershed permit should address multiple pollutants for only one category of sources (e.g., municipal discharges). Stakeholders might choose to limit or enlarge the geographic scope of the watershed-based permit to reduce complexity, or to reduce or expand the number of sources and pollutants considered by the permit.

In the course of completing this step, stakeholders might also identify a need to generate additional data to support the watershed-based permitting process. Additional data and information could come from the following sources:

- ◆ Requests under the authority of CWA Section 308 for point sources to provide additional information needed to develop their NPDES permits (e.g., effluent data, mixing studies).

- ◆ Voluntary monitoring or other studies by permittees participating in the watershed-based permitting process, perhaps through a monitoring consortium.
- ◆ Additional monitoring studies conducted by EPA, the state, a tribe, or a local government.

Step Four: Develop Watershed-Based Permit Conditions and Documentation

An NPDES permit has five major components: (1) a cover page, (2) effluent limitations, (3) monitoring and reporting requirements, (4) special conditions, and (5) standard conditions. In addition, each permit has an administrative record that documents the basis for permit conditions. This section summarizes the content of and process for developing each of these major permit components and the appropriate documentation for a watershed-based permit.

Cover Page

Though only a small portion of any NPDES permit, the cover page has a critical administrative function. It typically includes the name and location of the permittee[s], a statement authorizing each discharge, a list of locations of authorized discharges, and the effective period of the permit (not to exceed 5 years).

Effluent Limitations

Effluent limitations are requirements that restrict pollutant discharges from point sources. Permitting authorities spend a large portion of the time for permit development determining appropriate effluent limitations. Effluent limitations are developed by considering the technology available to treat pollutants (technology-based limits) and protection of the designated uses of the receiving water (water quality-based limits). The most protective limitation (either water quality- or technology-based) is included in the permit.

Technology-Based Limitations

For many point sources, technology-based effluent limitations are based on national standards. Municipal (POTW) discharges must meet secondary treatment standards and many nonmunicipal (industrial) discharges must meet national effluent limitations guidelines promulgated by EPA. Where national requirements are not available for industrial discharges, the permitting authority may have to establish technology-based limitations for each discharger based on best professional judgment.

Technology-based requirements in watershed-based permits are developed in the same manner as technology-based requirements for traditional individual permits. The applicable national standards apply regardless of geographic location and are based on performance capability of the specific industry. Similarly, technology-based limits developed by best professional judgement, although calculated for a specific discharger, are also based on performance capabilities. Technology-based effluent limits do not depend on the specific watershed or on site-specific environmental factors such as stream flow or existing ambient water quality. Where a watershed-based permit covers more than one category of discharges, there may be some technology-based requirements in the permit that apply to only a subset of all the discharges covered by the permit.

If technology-based effluent limitations are not sufficient to attain and maintain the applicable water quality standards, permitting authorities must develop water quality-based effluent limitations. Developing water quality-based effluent limitations presents the best opportunity to consider permit conditions based on overall watershed conditions, interaction among sources in the watershed, and watershed goals.

Water Quality-Based Limitations

EPA has issued detailed guidance on developing water quality-based effluent limitations in its *Technical Support Document for Water Quality-based Toxics Control* (1991) (TSD). Traditionally, water quality-based effluent limitations developed using the TSD approach reflect only the impact of the discharge from the facility, combined with upstream background concentrations or loadings of the pollutant of concern, where such data are available. Water quality-based effluent limitations developed for watershed-based permits, however, should consider multiple sources within the watershed. The permitting authority may have to use water quality models to determine the allowable pollutant load from all sources based on the applicable water quality standards or goals.

The key task in developing water quality-based effluent limits in a watershed-based permitting approach is determining the appropriate wasteload allocations for each of the point sources. Again, this process should have already been completed if there is a TMDL or watershed plan. These allocations may be expressed through multiple, coordinated permits, or a single permit that applies to multiple sources.

It is possible that some point sources included in a watershed-based permitting process will not have water quality-based effluent limitations for all pollutants of concern. The CWA and implementing regulations for the NPDES program require water quality-based effluent limits where necessary to achieve water quality standards. Where a facility does not have the “reasonable potential” to cause or contribute to an ambient excursion of water quality standards for a particular pollutant, a water quality-based effluent limitation for that pollutant at that facility may not be necessary (40 CFR 122.44(d)). Thus, it is possible that even a single watershed-based permit that applies to multiple sources could have a common set of water quality-based effluent limits for all point sources covered by the permit, and some water quality-based effluent limits that apply to a limited subset of dischargers. The more diversity in applicable effluent limitations across the set of point sources considered in the watershed-based permitting process, the more complex the watershed permit or permits will be. After assessing the need for water quality-based limits for all of the point sources in the watershed, stakeholders may determine that it is desirable to narrow the scope of the watershed permitting effort to a limited set of discharges or pollutants within the watershed (see Step Five: Issue Watershed-Based NPDES Permit).

Monitoring and Reporting Requirements

Monitoring and reporting requirements in a permit are used to characterize effluent and receiving water quality, evaluate wastewater treatment efficiency, and determine compliance with other permit conditions. Monitoring and reporting requirements in a watershed-based NPDES permit are likely to be a combination of individual discharges and watershed-wide requirements. Monitoring and reporting requirements included in the permit must provide the necessary data for the permittee to demonstrate compliance with the permit conditions. They should also support other watershed management activities. The monitoring should be part of the overall monitoring and assessment plan for the watershed, and provide data needed to determine progress toward watershed goals.

Individual Requirements

In a watershed-based permit, dischargers with individual technology-based or water quality-based effluent limitations or other individual permit conditions (e.g., ambient monitoring) will continue to have individual monitoring and reporting requirements reflecting those permit conditions. The *U.S. EPA NPDES Permit Writers' Manual* provides guidance on establishing individual monitoring and reporting requirements.

Watershed-Wide Requirements

In addition to individual monitoring and reporting requirements, watershed-based NPDES permits may contain watershed-wide requirements that could be applied to multiple dischargers within the watershed. For example, permittees may form a monitoring consortium that is collectively held responsible for demonstrating that ambient water quality standards are met as specified in the watershed-based permit. Depending on the structure of the watershed-based permit[s], watershed-wide requirements may be coordinated across several individual permits, or found in a single permit that applies to multiple sources. EPA has developed guidance on monitoring consortiums that may be helpful to permitting authorities in developing watershed-wide monitoring and reporting requirements (EPA 1997).

Special Conditions

Special conditions in watershed-based permits may include best management practices, compliance schedules, administrative and reporting requirements associated with a trading program, or special studies (e.g., mixing zone analyses, site specific criteria studies, studies to support analyses of attainability of designated uses, bioaccumulation studies). Special conditions may be applied to individual dischargers, to a group of dischargers, or watershed-wide. Incorporating requirements for special studies into a watershed-based permit presents an excellent opportunity for maximizing efficient use of stakeholder resources. For example, a group of dischargers collectively held responsible for a special study on sediment contamination might be able to complete the study more quickly and using less resources than if the permitting authority had to include requirements in individual permits to try to obtain the desired information.

Standard Conditions

Standard conditions are pre-established conditions that must be included in every NPDES permit, including watershed-based permits. Standard conditions describe the legal, administrative, and procedural requirements of the permit. Certain standard conditions are required by federal regulation (see 40 CFR

Useful Monitoring and Reporting Resources

U.S. EPA NPDES Permit Writers' Manual. EPA-833-B-96-003, Office of Water (4203) U.S. EPA, Washington, DC. U.S. EPA. 1996.
www.epa.gov/npdes/pubs/chapt_07.pdf

Monitoring Consortiums: A Cost-Effective Means to Enhancing Watershed Data Collection and Analysis. EPA-841-R-97-006, Office of Water (4503F) U.S. EPA, Washington, DC. U.S. EPA. 1997.
www.epa.gov/owow/watershed/wacademy/its03/

Elements of a State Water Monitoring and Assessment Program. EPA-841-B-03-003, Assessment and Watershed Protection Division, Office of Wetlands, Oceans, and Watersheds, U.S. EPA, Washington, DC. U.S. EPA. 2003.
www.epa.gov/owow/monitoring/elements/elements03_14_03.pdf

WHERE DO I FIT IN?
Developing Watershed-Based Permit Limits and Documentation

If you are the NPDES Permitting Authority, you can

- ◆ Develop the appropriate permit limits and, where necessary, allocate the wasteload.
- ◆ Provide stakeholders the opportunity to comment on permit limits prior to finalizing the permit.
- ◆ Identify opportunities for stakeholders to provide technical input into the process (e.g., conduct computer modeling, conduct special studies).

If you are a point source, you can

- ◆ Offer to contribute to the technical analysis required for developing water-quality based permit limits.
- ◆ Propose a special study to conduct as part of the permit.
- ◆ Provide comment on proposed permit limits during public hearings.
- ◆ Provide materials to include in the administrative record.
- ◆ Consider water quality trading opportunities to meet permit limits and water quality goals efficiently.

If you are a non-NPDES stakeholder, you can

- ◆ Offer to contribute to the technical analysis required for developing water-quality based permit limits.
- ◆ Propose a special study to conduct as part of the permit.
- ◆ Provide comment on proposed permit limits during public hearings.
- ◆ Host or facilitate a public meeting.
- ◆ Provide materials to include in the administrative record.

accordance with 40 CFR Part 124). Administrative requirements address public notice and comment; public hearings; EPA and state or tribal permit review; actions required for final permit issuance (e.g., approval of state environmental board); and requirements for modification or for permit appeal after final permit issuance. These requirements vary by jurisdiction.

Another major factor affecting the permit issuance process is the type or structure of the watershed-based permit. Watershed-based NPDES permitting approaches will vary from watershed to watershed.

122.41 and 122.42), but state permitting authorities may have additional standard conditions adopted in their state regulations.

Administrative Record

The administrative record forms the foundation for issuing a permit. Where EPA is the permitting authority, the contents of the administrative record are prescribed by regulation (40 CFR 124.9 and 124.18). In addition to the supporting documentation that would be in the record for any NPDES permit, the record for a watershed-based permit may include reports from facilitated stakeholder meetings, local watershed plans, nonpoint source loading or load reduction estimates, and any other documentation that explains or supports watershed-based requirements in the permit. Stakeholders interested in the success of a watershed-based permit should help to make sure that the permitting authority has the information it needs to develop a complete and orderly administrative record that is easy to access and understand.

Step Five: Issue Watershed-Based NPDES Permit

The most important factors affecting the process for issuing a watershed-based permit will be the administrative requirements and the type or structure of the permit.

Permitting authorities, permittees, and other stakeholders need to be familiar with the specific administrative requirements for permit issuance in their jurisdiction (in

As a result, the types of permits developed through a watershed-based permitting process will vary. There is no one single model or example of what an NPDES permit developed through watershed-based permitting should look like. Possible watershed-based permitting mechanisms are variations of general and individual point source NPDES permitting approaches. Examples of possible approaches are described below in more detail.

Integrated Municipal NPDES Permit

Coverage This permitting approach bundles all point source requirements for a municipality (i.e., POTWs, combined sewer overflows [CSOs], storm water [including municipal owned industrial activities such as public works and utility yards], biosolids, and pretreatment) into a single permit.

Rationale Many municipalities have multiple wastewater treatment plants, with each plant receiving a separate permit. In cases where the treatment plants; storm water; CSOs, if applicable; and other municipal-controlled point source activities are all under single ownership and within the same watershed boundaries, the permitting authority could consider one permit that covers and integrates all NPDES requirements.

Benefits This approach will reduce administrative burden for both the permittee and permitting authority (e.g., one application, one public notice and public hearing, one compliance report) and will allow the permitting authority to develop permit conditions (limits and monitoring requirements) that specifically address existing watershed goals and watershed management plans.

WHERE DO I FIT IN? Issuing Watershed-Based NPDES Permits

If you are the NPDES Permitting Authority, you can

- ◆ Research which permitting options are feasible given state-specific regulations and other regional or local considerations.
- ◆ Educate stakeholders on the pros and cons of each permitting option.
- ◆ Craft a preliminary draft of the permit and ask stakeholders for informal feedback.

If you are a point source, you can

- ◆ Conduct an analysis of which permit option would best suit your situation.
- ◆ Review and provide comments on the draft permit developed by the permitting authority.
- ◆ Comply with permit requirements while maintaining a log of challenges, benefits, and other recommendations for reissuance of the permit.
- ◆ Craft a preliminary draft of the permit and request permitting authority action.

If you are a non-NPDES stakeholder, you can

- ◆ Define the role you would like to play in the context of the permit.
- ◆ Serve as a liaison between permittees and non point source dischargers within the watershed that may affect the success of the permit and attainment of water quality goals.
- ◆ Provide comment on the draft permit developed by the permitting authority.
- ◆ Assist with an aspect of permit implementation, such as monitoring and reporting, as a way to gauge permit effectiveness.

Watershed-based Individual Permit—Multiple Permittees

Coverage This type of permitting approach is also a single permit and would cover multiple sources included in the same watershed, watershed plan, or TMDL. It would allow several point sources within a watershed to apply for and obtain permit coverage under the same permit.

Rationale This type of permit may be used in situations where a watershed plan or TMDL identifies the need to address a specific pollutant. A watershed plan or TMDL implementation plan may include agreed upon controls necessary to achieve watershed goals. Stakeholders could then identify point sources that would be logical to include in the same permit. A single permit would identify all point sources that have agreed to the controls and the individual requirements for each point source. An example is a permit that includes control requirements for nutrients issued to all POTWs in the watershed and requires specific nutrient reduction requirements that reflect agreed upon goals and trades. This type of watershed-based permit may be issued in addition to the existing individual permits and would include the necessary controls to address only the specific problem pollutant or pollutants. This approach is similar to the approach used for wastewater treatment plant discharges in North Carolina contributing nutrients to the Neuse River watershed (NCDENR 2002).

Another type of multiple source permit would address all pollutants of concern in the watershed. For example, a single permit could be used to implement a comprehensive watershed plan. The watershed plan would have to include procedures for addressing a number of stressors to a watershed and identify specific point sources. The permit would reflect controls for the point sources and include all requirements that would otherwise be found in separate individual permits for the point sources.

Benefits This approach allows for trades, if used, to be carried out, and includes any cooperative efforts (such as watershed-wide monitoring) necessary for meeting watershed goals. This approach also focuses public participation on a single permit.

Watershed General Permits

Coverage This approach relies on general permitting. These permits would be similar to many existing general permits, except that the watershed boundary (and not type of discharge) is the primary criterion defining eligibility for coverage or the applicability of certain conditions in the permit. The permit would include requirements that reflect watershed-specific goals (e.g., comprehensive watershed monitoring, nutrient reduction, management of biosolids or manure).

Rationale The general permit model is very similar to the multiple source permitting approach described above, however, the general permit would require point sources to request coverage through a notice of intent once the permit is issued rather than through the application process used for individual permits.

Benefits This general permitting approach could be further refined based on the category or source of discharger. The model would allow coverage of common sources (e.g., all POTWs, CAFOs), **or** storm water) within the watershed. The limitations and requirements within a category or subcategory of sources would largely be the same, but may differ among categories or subcategories.

In cases where a permit addresses multiple dischargers, it is important to consider how liability for any violations will be assessed. Options include, but are not limited to, specifying apportioned, joint, or joint and several liability. Under joint and several liability, where multiple actors cause or contribute to a violation, any one, combination, or all of the members of that group may be held fully liable for the violation. In contrast, joint liability provides for liability to be shared, whereas, apportioned liability assigns liability based on relative fault. When considering these options, the permitting authority should balance the need for efficient enforcement, clarity of permittee responsibility, and fairness among dischargers. Note that any such liability provisions must be consistent with applicable state law in NPDES-authorized states.

There are several factors to consider when determining what type of watershed-based permitting approach, such as the three described above, is right for a particular watershed. These factors include the types of sources participating in the process and requiring permit coverage, the availability of a watershed plan or TMDL, and the need to address multiple pollutants. The text box entitled “When Considering Watershed-Based NPDES Permitting, Consider This ...” on page 9 provides some helpful questions to ask when determining what type of watershed-based permit would be most appropriate in a particular watershed.

Step Six: Measuring and Reporting Progress

The ultimate goal of watershed-based permitting is to ensure that receiving water quality is protected through the implementation of an integrated, holistic approach. Progress toward attaining this overall goal can be measured at both the watershed and permit levels.

Watershed-Level Performance Measures

Watershed-level performance measures consist of water quality standards and other watershed goals developed by stakeholders. States, tribes, and territories generally track attainment of water quality standards through CWA 305(b) and 303(d) reporting. Other watershed goals developed by stakeholders should also be measurable to allow assessment of trends over time, much like water quality goals. Some of these measures may directly reflect environmental benefit (e.g., number of stream miles restored for aquatic life habitat). Others may reflect an intermediate step toward the ultimate environmental goal (e.g., number of storm drains labeled in a stenciling program, reduction in pounds per year of nitrogen loadings within the watershed).

Permit-Level Performance Measures

A properly developed watershed-based permit will be designed to achieve specific water quality standards and other goals through effluent limitations and other permit conditions, such as best management practices. These permit requirements are, in effect, the performance measures for the watershed-based permit. Some of these measures may directly incorporate watershed-level measures.

For example, the storm drain stenciling goal cited above could be directly incorporated as a BMP requirement in a watershed permit for a municipality or group of municipalities.

Monitoring and Reporting: Watershed-Based Permits as a Tool for Measuring Progress

As described in Step Four: “Develop Watershed-Based Permit Conditions and Documentation,” the permitting authority will develop monitoring and reporting requirements to ensure compliance with watershed-based permit effluent

limitations and other permit conditions. Thus, implementation of the permit assures performance measurement at the permit level (i.e., point sources in compliance with effluent limitations and other permit conditions). With careful planning, however, the monitoring and reporting requirements in the permit can also provide valuable data used to measure progress toward attainment of watershed-level performance measures. For example, ambient receiving water monitoring requirements may be included in the permit in order to evaluate the impact of the point source discharges on receiving waters and to measure progress toward attaining water quality standards. Data collected as part of the watershed-based permit can be combined with data and information generated by other related watershed protection

activities outside of the watershed-based permit (e.g., habitat restoration programs) to assess the overall condition of the watershed. Collectively, these measures would provide all stakeholders with an indication of progress against watershed-level performance measures.

When Developing Monitoring and Reporting Requirements for Performance Measurement, Consider Whether They Are ...

- ◆ Consistent with the effluent limitations and conditions (i.e., permit-level performance measures) contained in the watershed-based permit.
 - ◆ Consistent with measuring attainment of water quality standards and watershed management and protection goals (i.e., watershed-level performance measures).
 - ◆ Quantifiable so as to allow comparison over time.
 - ◆ Specific in terms of roles and responsibilities for data generation and reporting.
 - ◆ Understandable to all stakeholders.
 - ◆ Reflective of appropriate data collection and reporting methods.
 - ◆ Distinguishable between the various point and nonpoint sources contributing pollutants to the watershed.
 - ◆ Reported in a format that allows for efficient review by the permitting authority as well as all stakeholders.
 - ◆ Not overly burdensome in light of other monitoring and reporting requirements.
-

SECTION THREE: POTENTIAL BENEFITS AND CHALLENGES OF WATERSHED-BASED NPDES PERMITTING

Achieving water quality goals in a cost effective and efficient manner is one of the many potential benefits EPA anticipates that stakeholders such as permittees and permitting authorities may realize through watershed-based NPDES permitting. Although there is limited empirical information on the benefits of watershed-based NPDES permitting, EPA expects that ongoing pilot projects and other efforts will demonstrate a mix of both administrative and environmental benefits. As with any change EPA

anticipates that there will be several challenges in moving watershed-based permitting from concept to implementation. Overall, EPA believes that the benefits will overshadow the challenges.

Benefits of Watershed-Based Permitting

EPA anticipates a number of benefits from watershed-based permitting. Although the specific benefits will be unique to each project, they will likely include a mix of environmental and administrative benefits such as those described below.

Enhanced Opportunity for Environmental Results

Watershed-based permitting can help to expand the focus of the NPDES program beyond the “end-of-the-pipe” by promoting more ambient monitoring, permit conditions that consider upstream and downstream impacts, and consideration of all stressors. This approach provides the foundation for thinking more broadly about potential solutions to environmental problems or ways to attain watershed goals. Also, the additional information about the watershed gained from this approach to permitting will help the permitting authority develop more effective permits—even for point sources within the watershed that are not participating in the process.

Integration of Water-related Programs

Developing watershed-based permits requires much of the same data and information used in developing TMDLs, source water assessment plans under the SDWA and watershed management plans. Given the similarities in both process and required inputs, watershed-based permitting may serve as yet another driver facilitating integration of water resource protection programs under the CWA and the SDWA.

Targeted and Maximized Use of Resources to Achieve Greatest Environmental Results

Through the analysis to support the development of watershed-based permits, stakeholders may gain a better understanding of the stressors impacting watershed health. With better data, NPDES permitting authorities can develop targeted permit limits that tie to watershed data and goals, and target monitoring and inspections. Targeted permit limits will also reassure point sources that their efforts (e.g., investment in new technologies) will achieve the desired water quality results. In addition, more comprehensive watershed data may help stakeholders prioritize solutions (e.g., determine which pollutants and which sources to focus on first to achieve the greatest water quality improvements).

Administrative Efficiencies

Many states implementing the NPDES program using a basin-wide approach claim that such an approach results in a more streamlined permitting process (EPA 2002). For example, one large public meeting for a watershed might be more efficient than numerous smaller public meetings for each individual permit. Administrative efficiencies in the permitting process might enable permitting authorities to more effectively target valuable resources to the highest priorities and eventually help to alleviate permitting backlogs.

Local Cooperative Efforts

Watershed-based permitting can promote cooperation and collaboration among point source dischargers responsible for successfully complying with permit conditions and achieving environmental results. North Carolina has demonstrated this benefit through the formation of NPDES discharger coalitions that work together to determine the most equitable approach to reducing loadings (EPA 2002).

Watershed-wide Monitoring Plans

Watershed-based permits can be useful as a catalyst for designing watershed-monitoring plans and also as a key data source for these plans. Sharing responsibility for monitoring and data collection may result in cooperative efforts that reduce duplication of work and take full advantage of opportunities for sharing monitoring responsibilities and results, as well as helping ensure data are of the necessary quality. With a coordinated and integrated watershed monitoring plan, there will be one agreed upon set of data quality objectives and quality assurance/quality control protocols to follow.

Trading and Other Market-based Strategies

EPA believes that market-based approaches such as water quality trading may provide greater flexibility and have potential to achieve greater water quality and environmental benefits than current practices and policies. Watershed-based permits could be useful in facilitating trading. As discussed earlier, the process for developing watershed-based permits may include collecting loading data, which are necessary for making decisions related to trading. The watershed-based permitting process is also likely to include extensive stakeholder participation, which is also a necessary component for a successful trading program. Stakeholder participation and data exchange within the context of the larger watershed management planning process could facilitate use of market-based approaches among sources in a watershed.

Public Involvement

Permits contain many common elements that provide a good starting point for opening a dialogue with the point sources in the watershed community. Generally, as data are gathered and analyzed and the watershed plan is developed, the process for bringing in more stakeholders becomes clearer and easier. The permits provide a single location for gathering a lot of the data necessary for watershed plans.

Potential Challenges

As with the benefits of watershed-based permitting, the challenges of implementing this approach will be somewhat unique to each watershed and each permit. Challenges that stakeholders might encounter throughout the process are described below.

Expanded Stakeholder Involvement

As the scope of technical analysis and decision making in the permitting process expands from a single point source to a watershed, the number of parties with an interest in the outcome of the process will expand too. An expansion in stakeholders presents a challenge to and a new role for the permitting authority (i.e., facilitator). Engaging a wider variety of stakeholders means that the permitting authority and the permit writer will have to consider a broader range of interests and watershed goals when developing the permit—potentially adding both technical complexity and time to the permit development process. An expansion in stakeholder involvement will also challenge the other stakeholders as they take the time to understand one another's goals for and concerns about the watershed, and determine how to best structure the watershed-based permitting process to meet those goals.

Those involved in watershed-based permitting can address this potential challenge by developing a strategy for stakeholder involvement. Part of this strategy can include identifying a trained facilitator, or training the permitting authority to serve as a facilitator, to ensure the process is effective and stays on track. Another potential solution is to tap into existing watershed stakeholder groups and activities, rather

than establishing a new process. For example, in a watershed where a TMDL is under development there is likely to be a stakeholder group in place. Watershed-based permitting activities can piggy-back onto existing stakeholder meetings to present information and have decisions made.

Integrating Nonpoint Sources

As noted above, entities that contribute nonpoint source pollution play an important part in watershed-based permitting, both in achieving overall loading reductions of pollutants of concern and providing their input on watershed goals. It may be challenging, however, to integrate nonpoint sources into the watershed-based permitting process. Participation by nonpoint sources in most efforts will be voluntary, but some nonpoint sources might fear that getting involved in a watershed-based permitting process will lead to direct regulation of their activities. Other stakeholders will need to understand these concerns and structure the permitting process in such a way that it provides incentives for nonpoint source participation while addressing nonpoint source concerns about being involved in implementation of a point source regulatory program.

Many watershed-related activities garner the support and participation of nonpoint sources using mechanisms and incentives that may also work for watershed-based permitting. One effective mechanism for obtaining nonpoint source involvement is outreach, particularly peer-to-peer outreach. Technical and financial assistance often serve as incentives for participating in watershed management efforts. To overcome the potential challenge of integrating nonpoint sources, watershed-based permitting should tap into existing programs that currently involve nonpoint sources in the watershed – or provide an incentive for their involvement. Using a facilitator that has the trust of nonpoint sources within the watershed may also increase the potential for their participation.

Need for More Flexible Program Infrastructure

Watershed-based NPDES permitting will likely be very different from the process for developing more traditional NPDES permits. Permitting authorities and EPA have infrastructure in place to analyze data, develop permit conditions, track compliance, and conduct enforcement activities for traditional NPDES permits. Watershed-based permitting may require flexibility in this infrastructure. As previously discussed, more parties within and outside the permitting agency may be involved in the process and it may take longer than developing a traditional permit. Increased stakeholder involvement and addressing watershed-wide issues may require changes to the public notification and participation process for the NPDES program as well as other water programs (e.g., water quality standards, TMDLs). Permit conditions (e.g., trading arrangements, permit conditions that apply to multiple point sources) may require permitting authorities to think creatively about how to track compliance.

Overcoming this potential challenge requires a commitment from NPDES permitting authorities to identify program infrastructure “hurdles” and take steps to address them. Permitting authorities may not want to wait for hurdles to surface and take a pro-active approach by analyzing existing program processes and systems to identify possible changes that will support watershed-based permitting approaches.

Conflicting Jurisdictional Requirements

Developing permits watershed-wide may require permitting authorities and other stakeholders to overcome overlapping or conflicting jurisdictional requirements at the state or local level (e.g., differences in water quality standards, differences in local ordinances, differences in planning cycles). Permitting

authorities may also have to address differences in permit requirements or timing of actions required by existing permits. For example, combining municipal permitting requirements into a single watershed-based municipal permit may require reconciling schedules for storm water or CSO controls that differ under existing permits for each system.

An analysis of requirements at the federal, state, tribal, and local level is the first step to identifying potential conflicts and overcoming them to facilitate watershed-based permitting. The analysis should include program schedules, agency authority, jurisdictional boundaries, funding cycles, and public participation requirements. Through this analysis, identify points of conflict and opportunities for coordination. In addition to conducting this type of analysis, watersheds could also exchange strategies and effective actions for overcoming jurisdictional conflicts. This type of information exchange could happen in the form of watershed-based permitting case studies, presentations, and/or forums such as conferences and other types of meetings.

Regulatory Structure

As the watershed-based permitting process develops within a particular watershed, stakeholders may come up against a number of challenges related to the existing regulatory structure. For example, permitting authorities may face the challenge of structuring permit requirements that depend on nonpoint source reductions or point-nonpoint source trades in such a way that they are legally enforceable, but do not encroach upon the voluntary nature of nonpoint source participation in the process. As stakeholders identify such challenges, it will be important for them to work closely with both the permitting authority and EPA to determine how to address them. EPA, in particular, might be able to apply its experience in other jurisdictions to help resolve these issues.

EPA and many jurisdictions embarking on a watershed-based permitting approach are examining regulatory issues and identifying potential challenges. EPA is encouraging stakeholders to exchange research and analysis conducted on regulatory issues to avoid duplication of efforts and promote the sharing of ideas and strategies. Identification of challenges related to regulatory structure will enable EPA to find solutions that work within the existing regulatory structure, or take steps to make the necessary changes.

Making an Initial Investment

As with any changes in ways of doing business, moving to a watershed-based permitting process requires an initial investment of time and resources. Permitting authorities in particular may, understandably, be reluctant to make this initial investment in light of their responsibility for timely permit issuance—often in times of decreasing budgets. Where point sources or other stakeholders are initiating the watershed-based permitting process, it is critical that they be able to clearly explain why making an investment in watershed-based permitting will pay off in both environmental benefits and administrative benefits for the stakeholders involved.

Measuring and reporting successes – both environmental and administrative – linked to watershed-based permitting activities may encourage permitting authorities, point sources, and other stakeholders to make the initial investment in this approach. This requires stakeholders making the initial investment to think about how they will measure and track success, as well as how they can share successes. Some stakeholders have shared their process and preliminary results through conferences, case studies, and

articles. Dissemination of success stories could expand to include formats such as web sites and annual reports. It is likely the learning curve associated with watershed-based permitting will become shorter as more and more watersheds gain experience in this process, reducing the time and resources other watersheds will invest when taking this approach.

SECTION FOUR: MOVING AHEAD IN WATERSHED-BASED PERMITTING

Watershed-based NPDES permitting is gaining momentum as an innovative approach to addressing the nation's remaining water quality issues. EPA is committed to accelerating watershed-based permitting efforts through a variety of actions focused on education and technical assistance. Next steps related to promoting watershed-based permitting include the following:

- ◆ **Preparing additional guidance documents.** In addition to this implementation guidance document, EPA will develop follow-on guidance documents that address the technical and procedural aspects of the watershed-based NPDES permitting approach.
- ◆ **Providing technical education.** As mentioned in the previous sections, it is imperative to have the support of the NPDES permitting authority—both program managers and permit writers—to successfully implement watershed-based permitting. By providing the necessary tools for implementation, EPA will increase the likelihood that NPDES permitting authorities will buy in to the approach. EPA intends to develop educational resources, such as a module on watershed-based permitting in the NPDES Permit Writer's Training Course, to ensure that NPDES permitting authorities (and other key stakeholders) have the appropriate resources and training to undertake this approach.
- ◆ **Developing and reporting on case studies and pilot projects.** EPA is working with each regional office to identify examples of watershed-based permitting. If no examples exist, EPA will encourage the development of pilot projects to generate real-world experience and lessons. By tracking ongoing permitting efforts and pilot projects, EPA intends to generate and disseminate educational information (e.g., lessons learned for overcoming procedural challenges) that will benefit other watershed-based permitting efforts. As projects are completed, the lessons learned from the project will be added to a compendium of case studies that will be periodically updated.
- ◆ **Supporting efforts by state NPDES permitting authorities.** EPA is committed to providing technical support and other resources to state NPDES permitting authorities interested in initiating watershed-based permitting activities.

With this initial guidance, EPA has renewed its commitment and reenergized its efforts to fully incorporate the watershed approach into the implementation of the NPDES Permitting Program and create a comprehensive suite of resources to achieve that goal.

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Appendix A
MEMO AND POLICY

<http://cfpub.epa.gov/npdes/wqbasedpermitting/wspermitting.cfm>

Appendix B

WATERSHED-BASED NPDES PERMITTING CASE STUDIES

<http://cfpub.epa.gov/npdes/wqbasedpermitting/wspermitting.cfm>