

# **Framework Description for Watershed Management in Missouri**

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# **MISSOURI DEPARTMENT OF NATURAL RESOURCES**

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## Glossary and List of Acronyms

CWA	Clean Water Act
Department	Missouri Department of Natural Resources
ESP	Environmental Service Program
EPA	U.S. Environmental Protection Agency
GIS	Geographic Information System
HUC	Hydrologic Unit Code
MDC	Missouri Department of Conservation
MoCWIS	Missouri Clean Water Information System
MoDNR	Missouri Department of Natural Resources
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resource Conservation Services
PDWB	Public Drinking Water Branch
PTD	Permit to dispense
SRF	State Revolving Fund
TMDL	Total Maximum Daily Load
USGS	U.S. Geological Survey
WLA	Waste Load Allocations
WMP	Watershed Management Plan
WPP	Water Protection Program
WQAS	Water Quality Assessment System
WQMS	Water Quality Monitoring Section
WQBELs	Water Quality Based Effluent Limitations
WQP	Water Quality Plan

## Acknowledgements

This document is a product of the Watershed-Based Management Team. It was developed, with the assistance from Water Protection Program Personnel, and information gained from other states who have implemented a Watershed-Based Management Framework or other watershed-based management strategies.

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### **State Agencies**

Florida Department of Environmental  
Protection

<http://www.dep.state.fl.us/water/watersheds/index.htm>

Minnesota Pollution Control Agency

<http://www.pca.state.mn.us/index.php/water/types-and-programs/watersheds/map.html>

Mississippi Department of Environmental  
Quality

[http://www.deq.state.ms.us/MDEQ.nsf/page/WMB\\_About\\_BMA?OpenDocument](http://www.deq.state.ms.us/MDEQ.nsf/page/WMB_About_BMA?OpenDocument)

North Carolina Division of Water Quality

<http://portal.ncdenr.org/web/wq/ps/bpu/about>

Tennessee Department of Environment &  
Conservation

<http://www.tn.gov/environment/watersheds/index.shtml>

## Executive Summary

In November 2011, the Missouri Department of Natural Resources (department) announced *Our Missouri Waters* initiative, a new watershed-based approach that will change the way the department conducts aquatic resource management. This initiative will take a coordinated, holistic approach to management of Missouri's diverse aquatic resources. Focusing on watersheds will allow the department to use the interrelationship of water quality with all of the activities that occur in the associated watershed including monitoring, assessment, planning, permitting, modeling, conservation incentives, and other department activities. This document provides a framework for stakeholders to consider when coordinating the aquatic resource activities of the department's various programs, including the Water Protection Program (WPP) and the Soil and Water Conservation Program (SWCP).

The overall goal of this document is to provide a recommendation to department management and other stakeholders for:

- a coordinated approach to evaluate (water quality monitoring and assessment of pollutant sources) each watershed at a defined scale;
- a phased approach to National Pollution Discharge Elimination System (NPDES) site-specific permitting of point sources based on a rotating watershed cycle that focuses on department and stakeholder efforts on prioritizing protection options;
- a schedule to rotate the watersheds through the phases; and
- integration with the department's *Our Missouri Waters* initiative.

The framework provides an overall strategy and opportunity for streamlining and coordinating activities not only within the department's WPP but also within programs and external entities (such as other state agencies, federal agencies, municipalities, private and stakeholder interest groups, etc.). The holistic approach to watershed management will help the department and other stakeholders assess and achieve watershed goals and address aquatic resource issues and concerns more effectively.

The department has identified several main components that constitute a general framework for Missouri's watershed-based management approach. A summary of these components are described below.

- Management Unit Component: Many of the department's WPP management activities will be implemented within a sub-basin or 8-digit Hydrologic Unit Code (HUC).
- Management Unit Cycle Component - The length of the cycle was chosen to coincide with Clean Water Act Section 402 NPDES permitting requirements (five years) and does not necessarily dictate the length of specific activities described in this document. The five-year planning cycle is a framework that provides a systematic approach for planning and assessment, data gathering, data evaluation, plan and strategy development and implementation. Below is a list of suggested phases to be achieved over a five-year timeframe:
  - Phase 1: Planning & Preliminary Assessment
  - Phase 2: Data Gathering
  - Phase 3: Data Analysis and Total Maximum Daily Load (TMDL) Planning
  - Phase 4: Watershed Planning and Permit Renewal Initiation
  - Phase 5: Implementation
- Statewide Management Unit Cycle Schedule Component – This component provides an overview of the management cycles for each of Missouri's 66 management units 8-digit HUC watershed.
- Department Coordinators Component - To coordinate efforts within the department and within the five groups of watersheds, it is important for the department to have dedicated staff assigned and committed to implementing and maintaining the framework into the future.
- Stakeholder Coordination and Involvement Component – This component provides information on how to involve and retain stakeholder participation (via statewide, watershed, or *ad hoc* committees).

- Watershed Planning Component – This component provides guidance regarding the type of information to include in a watershed planning document to be used by local stakeholders, organizations, and other interested parties within the watershed.

In addition, identifying key roles and responsibilities is necessary for any watershed planning effort and is essential for long-term sustainability of the framework. Knowing when an activity is planned and by whom allows stakeholders and partners to become actively involved in the coordination and planning processes during all phases of the framework. In the past, the programs operated somewhat independently of one another. In an effort to streamline and coordinate program efforts, the implementation of the framework will require a change in mindset within the department. While the roles and responsibilities of each program remains the same, the programs will plan and coordinate activities over a management unit cycle.

Assigning priorities can and should be conducted at multiple levels and allow flexibility to meet the needs and goals of a watershed. The WPP and regional offices plan, coordinate, and set workload priorities annually preceding the State of Missouri's fiscal year (July 1 - June 30). This level of planning and coordinating effort will be similar to past years, but will be focused to coordinate and conduct activities to occur within the group of 8-digit HUC watersheds as they rotate through each phase of the management unit cycle (Phases 1-5).

For success of any watershed-based management framework, the framework itself should provide flexibility to adapt to unexpected delays and events. The framework must provide the ability to correct processes and adjust as needed within both a five-year time frame and specific phase. The document provides an overview of challenges and suggestions for success with Missouri's approach based on other state comments and recommendations, and information stated in the 2002 U.S. Environmental Protection Agency's *Review of Statewide Watershed Management Approaches*

([http://water.epa.gov/type/watersheds/upload/2003\\_07\\_03\\_watershed\\_approaches\\_fr.pdf](http://water.epa.gov/type/watersheds/upload/2003_07_03_watershed_approaches_fr.pdf)).

## Chapter 1 - Introduction

In November 2011, the Missouri Department of Natural Resources (department) announced *Our Missouri Waters* initiative, a new watershed-based approach that will change the way the department conducts aquatic resource management. This initiative will take a coordinated, holistic approach to management of Missouri's diverse aquatic resources. Focusing on watersheds will allow the department to use the interrelationship of water quality with all of the activities that occur in the associated watershed including monitoring, assessment, planning, permitting, modeling, conservation incentives, and other department activities. This document provides a draft framework for stakeholders to consider when coordinating the aquatic resource activities of the department's various programs, including the Water Protection Program (WPP) and the Soil and Water Conservation Program (SWCP).

In July 2011, the department formed the Watershed-Based Management Team to draft a watershed-based management framework for the WPP. Rather than create a new planning process from the ground up, the Watershed-Based Management Team has conducted research on watershed planning in other states and the U.S. Environmental Protection Agency (EPA). The team reviewed plans and spoke with other agencies to learn from their experiences to develop a more effective planning framework for watershed management. The team reviewed plans from several agencies and planning groups including Kansas, Kentucky, the City of Los Angeles, Mississippi, Florida, Nebraska, North Carolina, Ohio, and Tennessee.

### What is a Watershed-Based Approach?

Watershed-based management is a process of creating and implementing plans, programs, and projects to sustain and enhance aquatic resources within a watershed. It is a method of more efficiently and effectively managing existing regulatory and non-regulatory programs to protect, preserve, and enhance Missouri's aquatic resources. The department does not intend to create a new regulatory program, rather it intends to streamline and coordinate existing processes among programs. While the roles and responsibilities of each program remain the

same, the implementation of the framework will require a change in mindset within the department for a fully integrated watershed-based approach.

According to the EPA, “[i]ncreasingly, State [*sic*] and Tribal water resource professionals are turning to watershed management as a means for achieving greater results from their programs. Why? Because managing water resource programs on a watershed basis makes good sense -- environmentally, financially, and socially” (U.S. EPA 1996).

### **Why use a Watershed-Based Approach?**

Since watersheds are defined by natural hydrology, they represent a logical basis for managing water resources. The resource becomes the focal point and managers are able to gain a more complete understanding of overall conditions in an area and the stressors that affect those conditions.

Traditionally, water quality improvements have focused on specific sources of pollution such as sewage discharges or specific water resources such as a river segment or wetland. While this approach may be successful for addressing specific problems, it often fails to address the more subtle and chronic problems that contribute to a watershed's decline. Watershed management can offer a stronger foundation for uncovering the many stressors that affect a watershed. The result is the department and WPP will be better equipped to determine what actions are needed to protect or restore the resource.

Besides the environmental benefits, watershed approaches can have the added benefit of saving time and money. Whether the task is monitoring, modeling, issuing permits, or reporting, a watershed approach offers many opportunities to simplify and streamline the workload. For example, synchronizing monitoring schedules so that all monitoring in a given area (e.g., a watershed) occurs within the same timeframe can eliminate duplicative trips and greatly reduce travel costs.

## Goals of a Watershed-Based Approach

The overall goal of this document is to provide a recommendation to department management and other stakeholders for:

- a coordinated approach to evaluate (water quality monitoring and assessment of pollutant sources) each watershed at a defined scale;
- a phased approach to National Pollution Discharge Elimination System (NPDES) permitting of point sources based on a rotating watershed cycle that focuses on department and stakeholder efforts on prioritizing protection options;
- a schedule to rotate the watersheds through the management unit cycle phases; and
- integration with the department's *Our Missouri Waters* initiative.

The department is moving toward adopting a watershed-based management approach to protect and preserve Missouri's aquatic resources through improved integration and coordination of existing programs. Some of the benefits of a watershed-based management approach include:

- more streamlined and equitable permitting programs,
- an increase in the quality and quantity of monitoring data,
- better focused water quality assessments and planning,
- improved coordination and integration of state water program functions and goals,
- greater public involvement in state water quality program decision-making,
- collaboration with all stakeholders to promote innovation and integration of state agency programs,
- integration of economic, environmental, and community objectives.

The benefits of the watershed-based management approach will be realized over time; as such many of the benefits of the approach have become our goals. The generalized goals of the watershed-based management approach are:

### *Goal 1 – Improve Department/Program Efficiency*

Efficiency is increased once all agencies with responsibilities for natural resources begin to work together to improve conditions in a watershed. In its truest sense, watershed protection engages all partners within a watershed, including federal, state, and local agencies and community leaders. By coordinating their efforts, these agencies can complement and reinforce each other's activities, avoid duplication, and leverage resources to achieve greater results than can be accomplished individually.

### *Goal 2 – Improve Effectiveness and Streamlining of Water Protection Program*

This goal will involve streamlining the activities of the WPP. The watershed approach provides structure for integrating and streamlining decision making that are currently made within separate units or sections, which follow specific responsibilities that would not normally be interconnected with parallel work from other units or sections simply because a coordination framework has not been previously expected or mandated. For instance, the rotating basin planning process will provide a process of data collection, planning, and implementation that will cross program boundaries and allow leveraging of program funding to achieve collective watershed-specific goals. In addition, efficiencies in process of NPDES permitting may be found in synchronizing permit renewals. Having synchronized permit renewals will allow planning and implementation of Total Maximum Daily Loads (TMDLs) where needed. If Missouri adopts a pollutant water quality trading system, a watershed-based framework will be essential to effective implementation.

### *Goal 3 – Improve Management Prioritization*

Once the statewide rotating basin planning approach is established, a detailed schedule of management activities will help prioritize activities and target resources. The schedule specifies when particular activities will occur during the five-year cycle, thus providing a long-term reference for all stakeholders and management.

Watershed conditions, management priorities and goals, and management capabilities all change with time and managers must respond accordingly. Management will have the ability to target resources by using a watershed analytical approach.

*Goal 4 – Coordinate Water Quality Monitoring and Assessment at a Defined Watershed Scale*

Many statewide rotating watershed approaches divide their watershed management units into smaller units using the U.S. Geological Survey's (USGS) Hydrologic Unit Code (HUC) system (8-, 12-digit HUCs), with units becoming smaller as the number of digits increases (see Page 16, Management Unit Component, for more information). Having management units within a range of geographic scale provides a means of focusing down to specific needs within a local area, or aggregating up to a larger watershed level to address wider-scale issues. Together, these nested units provide the spatial basis for coordinating efforts within a statewide framework.

*Goal 5 – Coordinate a phased approach to National Pollution Discharge Elimination System permitting of point sources and better implementation of Total Maximum Daily Loads*

A five-year, phased approach for a watershed-based monitoring and reporting follows the Clean Water Act (CWA) Section 402 permitting cycle. The department proposes to have five phases within the watershed-based management cycle. These phases will, in general, involve scoping, data collection, assessment and evaluation. Stakeholders first identify what they know about conditions in the watershed, along with the most important issues to follow up on for this management cycle iteration. Next, data and information are collected strategically to fill information gaps and support further assessment and management strategy development. Assessment and targeting phases can produce a clearer picture of relative risks of identified problems and can help stakeholders prioritize areas where joint management actions are most needed and feasible. For targeted areas within the watershed, stakeholders use their forums at the local or watershed scale to develop plans and implement these plans in other phases.

*Goal 6 – Gain greater public involvement in state water quality decision making process*

Watershed partners will deliver enhanced technical assistance to the local watershed groups that the department relies upon to address nonpoint source pollution. That technical assistance may include monitoring, quality control, data management, watershed assessment, modeling and securing funds. In addition, the increase in partnership capacity and decision-making can improve public perception, lead to acceptance of important decisions and ultimately lead to improved regulatory compliance.

### *Goal 7 – Improve consistency of Management Decisions*

A watershed-based management framework will improve information gathering that will provide department management with better guidance on risks to the environment and public health, thus increasing their capacity to make informed decisions about statewide priorities and program implementation.

### **Department’s Plan to Develop a Framework for Missouri**

After review of other states’ watershed-based frameworks and EPA’s guidance document, the Watershed-Based Management Team developed this framework document for department review. EPA has nine-key elements that are recommended when developing a watershed framework. EPA does not direct states in the development of watershed approaches, rather it encourages them to develop approaches that are unique to their circumstances. Among the primary framework components, early involvement of stakeholders is a key component to successful implementation of a framework. The department has and will continue to recruit partners and establish common purposes among partners. A framework will be implemented after it has been tailored to the department circumstances. The subsequent chapters will discuss the 8-digit HUC management units, stakeholder involvement, program roles and responsibilities, statewide schedules and challenges to implementation. The Watershed-Based Management Team believes that a strong outreach and training program and development of guidance documents and policies will aide in the transition to a working framework. Finally, a program of self-assessment and adaptive management will help maintain and operate the framework once it is implemented statewide.

## Chapter 2 – Missouri’s Framework

### Framework Overview

The framework provides an overall strategy and opportunity for streamlining and coordinating activities not only within the department’s WPP, but also with programs and external entities (e.g. other state agencies, federal agencies, municipalities, private and stakeholder interest groups, etc.). The benefits of this effort will help the department and other stakeholders assess and achieve watershed goals and address aquatic resource issues and concerns more effectively, following a holistic approach to watershed management.

The Watershed-Based Management Team has identified several main components that constitute a general framework for Missouri’s watershed-based management approach. A summary of these components are described below. This framework is consistent with guidance provided by the EPA and several other states that have adopted a statewide watershed-based management approach.

### Components of Missouri's Framework

#### *Management Unit Component*

Management Unit: Although the term “watershed” is used commonly in discussions to describe various sized and geographic drainage areas, it is a specific term that describes a 10-digit HUC scale, according to the Federal Standards and Procedures for the National Watershed Boundary Dataset. The 8-digit HUC is considered a sub-basin according to this standard. Many of the department’s WPP management activities will be implemented within a sub-basin or hereafter referenced as an “8-digit HUC” watershed level.

A variety of watershed scales were considered (e.g. Ecological Drainage Units, Ecoregions, 14-digit HUCs, and 12-digit HUCs). Due to geographical size, resources, and the availability of information, the department recommends a planning level to be no greater than an 8-digit HUC. The advantages to the 8-digit HUC are that: 1) many federal and state agencies already manage resources at this scale; 2) public recognition of watersheds or whole intact basins exist; and 3) it works best for the National Pollutant Discharge Elimination System

(NPDES) site-specific permitting process and provides a balanced workload among the regional offices. Therefore it is recommended activities within the watershed-based management approach be coordinated on a statewide rotation basis at the 8-digit HUC level.

The 8-digit HUCs were established by the U.S. Geological Survey (USGS). It is a national system of hydrologic units, used for cataloging watersheds to provide a common national framework for delineating watersheds and their boundaries. The USGS 8-digit HUCs are the geographic units that the department will implement its watershed-based management approach. Missouri is made up of 66, 8-digit HUCs (Figure 1 and Appendix A) that provide a geographical boundary in which many of the department's WPP management activities will be coordinated. These activities include, but are not limited to NPDES site-specific permit synchronization; watershed assessments; water quality monitoring; and implementation. Other activities may be incorporated as opportunities arise or as the framework matures over time.



Figure 1: Map of Missouri's Watersheds (delineated by 8-digit Hydrologic Unit Code)

The 8-digit HUCs can be broken down into smaller units or sub-watersheds, such as 12-digit HUCs. Missouri contains 1981, 12-digit HUCs (USDA, n.d.). When appropriate or practical, management activities may be focused on a 12-digit HUC level to concentrate planning and implementation activities to achieve greatest impact or benefits. To address specific stakeholder concerns, the framework must be flexible to allow for planning and implementation activities to be focused on a smaller geographical region, such as the 12-digit HUC.

### *Management Unit Cycle Component*

Management Unit Cycle Component: A specific timeframe and schedule of activities are necessary to effectively manage, coordinate, and focus many WPP activities with other

agencies and interested parties within a management unit. The length of the cycle was chosen to coincide with NPDES permitting requirements and does not necessarily dictate the length of specific activities described in this document.

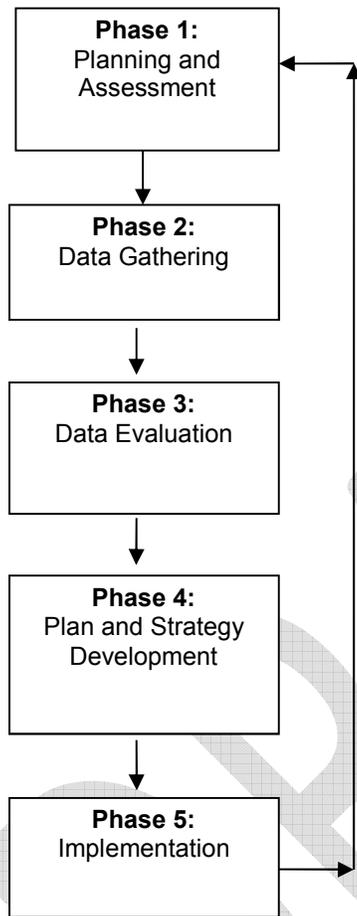


Figure 2. Phases of the Management Unit Cycle

Below is a summary of the benefits for implementing a management unit cycle:

- The approach provides the basis for coordinating other WPP activities over a five-year timeframe and provides a long-term management tool that builds upon past activities and efforts.
- The phased rotational approach allows local stakeholders within the management units to know in advance when certain coordination activities will occur.
- The approach provides an opportunity for local stakeholders and the department to share and leverage resources toward accomplishing watershed goals.
- Coordinating efforts on a scheduled and rotational basis provides opportunities to utilize various resources to effectively and efficiently coordinate watershed activities.

The five-year planning cycle is a framework that provides a systematic approach for planning and assessment, data gathering, data evaluation, plan and strategy development and implementation (Figure 2). This is a holistic approach that includes building partnerships, assessing and documenting concerns, setting watershed goals, identifying solutions, and developing an implementation plan for completing activities. However, a one-size-fits-all approach is not appropriate for all 66, 8-digit HUC watersheds. Watersheds are unique and can vary greatly depending on population, land use, issues or concerns, and stakeholder buy-in. Allowing flexibility to address watershed management needs and activities is a must and

should be considered. Establishing a mechanism for evaluating both the framework and watershed conditions over time is also essential for the success of the watershed-based management approach.

Below is a list of suggested activities or phases to be achieved over a five-year timeframe and a suggested list of responsible entities who should be involved in the planning efforts. The specific roles and responsibilities of each entity are discussed in greater detail in Chapter 3 – Roles and Responsibilities. Each phase can be utilized to contribute to the overall management of the watershed to develop strategies for improved water quality through focused efforts, tailored to the identified issues or threats at varying levels within the 8-digit HUC or smaller units. Through a phased cycle approach, each phase builds upon the other. However, there may be some cases in which overlap of work activities may occur between phases or where some activities have to be postponed. This is acceptable as long as subsequent dependent phases are not adversely affected and the activities are retained to be completed and tracked within the overall WQP and/or WMP. The information obtained during the five-year process is coordinated and tracked through the use of a Water Quality Plan (WQP) and Watershed Management Plans (WMP), both of which are discussed in greater detail later in this document.

Many of the department's internal operations, workloads, projects, and water quality monitoring events are planned, scheduled and budgeted annually based on the State's fiscal year, which runs from July 1 through June 30. For greater ease of planning with department activities, Phase 1 and subsequent phases should begin at the beginning of the fiscal year.

***Phase 1 – Planning & Preliminary Assessment***

**Responsible Entities:** Regional Watershed Coordinators, Regional Water Pollution Liaison, Regional Staff, Water Protection Program (Permits, Engineering, and Watershed & Assessment Units), Environmental Service Program, Soil and Water Conservation Program Coordinators, Partner Agencies, and Stakeholders

This first cycle (Phase 1) provides several opportunities to identify partnerships with other agencies, form stakeholder or watershed groups, coordinate with other entities to share or collect additional data, and refine previously established watershed priorities, goals, strategies, and implementation schedules. The purpose of this phase is to gain an understanding of the watershed, determine or inventory the type of available data and information, identify data gaps and needs, and determine the extent of aquatic resource issues and concerns. Once this information has been compiled, it can be summarized into a WQP (Appendix F) and presented to interested parties to gather additional input and concerns, begin an educational campaign involving watershed stakeholders groups, and build partnerships. Where there is sufficient local stakeholder involvement and a prioritization of the 12-digit HUCs has been completed, ideally a WMP will be developed. This will incorporate new and existing water quality information including point and nonpoint source information.

Data planning information should be developed based upon the needs of each of the 12-digit watersheds within each Management Unit. WPP, Regional Watershed Coordinators, and the Regional Water Protection Liaison, in conjunction with other stakeholders, will need to determine which of the 12-digit HUCs are priority watersheds and may only need to recommend a continuation of stakeholder development or water quality maintenance in selected/priority watersheds.

The WQP is a five-year action plan for the all 66, 8-digit HUC watersheds entering into Phase 1 of the framework cycle. The plan provides general information on WPP activities based upon available information and future needs. At minimum, a WQP should specify the following:

- Watershed conditions, trends or improvements,
- Water quality trends, threats, or impairments,
- Monitoring and assessment efforts, data gaps, and environmental data needs,
- Watershed goals or strategies
- Available resources (technical and financial),

- Opportunities to coordinate with local stakeholders and other state, federal, or local agencies and neighboring states to leverage and share information, and fill data gaps to properly assess watershed conditions.

The type of data, methods, and reporting units that are needed by each watershed to ensure data gathered during Phase 2 are consistent and of the quality and quantity required by the department to meet EPA regulatory requirements and to make scientific-based decisions as it relates to watershed conditions (Appendix F). The availability or formation of a Stream Team may be an important aspect to consider. For example, Stream Team water quality collection efforts may be used to document long-term baseline conditions and to determine when or whether higher quality level data collections efforts are warranted. Where possible, it will also be important to coordinate and incorporate any other department initiatives or strategies (e.g., Missouri River Basin Initiatives, Missouri Nutrient Reduction Strategy, etc.) into the WQP (reference Appendix C for other department initiatives).

During this phase the permit and regional office staff will begin gathering NPDES permit information for each management unit group entering into Phase 1. Planning and coordination between regional office and central office staff will occur to obtain information and data needs prior to the issuing or renewing of permits in Phase 5.

### ***Phase 2 – Data Gathering***

**Responsible Entities:** Regional Watershed Coordinators, Regional Water Pollution Liaison, Water Protection Program (WQ Monitoring & Assessment, Permits, TMDL, and 319 Units), Soil and Water Conservation Program and Partner Agencies

During this phase, data collection efforts are performed to address the needs identified during Phase 1, and WPP activities (including NPDES permitting requirements). Activities can include the collection of field data, facility data, and other types of data collection to fulfill the monitoring objectives for WPP that support and supplement the following: Ambient monitoring network, TMDL development, Clean Water Act Sections' 305(b) and 319

purposes, Waste Load Allocations (WLA) studies, Water Quality Assessment, and NPDES permit compliance as schedules and priorities allow. Additional information on WPP data collection efforts are explained in Chapter 3 – Roles and Responsibilities. For watershed assessment purposes, data gathering efforts should also include Geographic Information Systems (GIS) data sets, land use inventories, Soil and Water Conservation Districts' Needs Assessments, tracking source water and nine-element WMPs, land management implementation tracking, and the collection of other information to aid in WPP program activities.

### ***Phase 3 – Data Analysis and TMDL Planning***

**Responsible Entities:** Regional Watershed Coordinators, Regional Water Pollution Liaison, Water Protection Program (WQ Monitoring & Assessment, TMDL, Modeling, and Permit Units), Soil and Water Conservation Program and Partner Agencies

Based upon available data gathered and collected in Phase 1 and 2, qualitative and quantitative analyses are performed to evaluate and document the severity, extent/causes, and sources of stress to watershed resources. This should also include documenting pollutant loads for the entire watershed or priority watersheds (e.g., 303(d) impaired streams) and, support the TMDL processes, and other department regulatory requirements. In addition, NPDES facility information along with in-stream data should be reviewed to determine permit adequacy.

Ideally, WPP staff, local stakeholders, and interested entities (local governments, other agencies) could be assigned assessment responsibilities according to expertise, and available resources. Coordinating and sharing assessment data gathered by various entities is important for long-term sustainability of a watershed-based approach. Summarizing the information into a WQP is recommended to establish management priorities and allocate resources to address water resource issues and concerns. Over time, the watershed conditions or assessment reports could be used to evaluate and track improvements or changes as a result of implementing a watershed-based approach. Data evaluation also provides the basis for appraising the success of past management activities and targeting future management efforts.

Data evaluation and tracking is also part of the watershed management planning process and the nine-element WMP. WMP are discussed later in this chapter under Watershed Management Component.

NPDES site-specific permit data collection and assessment efforts (e.g., facility monitoring and inspections) will continue as needed to provide sufficient information in advance of the permit issuance/renewal (Phase 5).

#### ***Phase 4 – Watershed Planning and Permit Renewal Initiation***

**Responsible Entities:** Regional Watershed Coordinators, Regional Water Pollution Liaison, Water Protection Program (Permits, Engineering, WQ Monitoring & Assessment, TMDL, and Modeling), Water Resources Center, Source Water Protection Program, State Revolving Fund Program, Stakeholders, and Partner Agencies

To better manage aquatic resources for each management unit, targeted objectives and strategies need to be established. This can be accomplished through a watershed planning process and development of two items: a WQP (an internally developed WPP watershed activity planning document at the 8-digit HUC level developed in Phase 1 and 2), and a WMP (a detailed holistic, watershed stakeholder driven process at the 12-digit HUC or smaller level).

The planning process should involve a variety of stakeholder interest groups and expertise. For a successful watershed management approach, it is important that local stakeholders are involved in establishing the goals, objectives, and strategies at the 12-digit HUC or smaller level into a nine-element WMP. WMPs are to be developed where appropriate and based on water quality priorities (e.g., local concerns, 303(d), TMDL, etc.). Stakeholder involvement will be critical in carrying out many components of the watershed planning process through completion and into implementation (Phase 5).

The WMP documents should be based upon sound science and stakeholder consensus to establish cost-effective solutions that are accepted by those who will be responsible for

implementing all or portions of the plan. Planning strategies may include, but are not limited to:

- General discussion of management actions to apply throughout the watershed that specifically address water quality concerns and impairment
- TMDLs/Waste Load Allocations/Load Allocations summaries, including existing allocations and remaining loads for future allocations
- TMDL implementation plans
- Pollution prevention plans
- Suggested strategies for:
  - waters in need of special protection
  - protecting wetlands
  - protecting groundwater
  - future water quality monitoring needs
  - education and outreach
  - water quality trading
  - point source management updates
  - nonpoint source management
- General discussion of the viability/feasibility of NPDES site-specific watershed permitting

The nine-element WMP to be written at the sub-watershed level (no larger than 12-digit HUC scale) is a holistic approach to stating and solving water quality issues. A WMP describes strategies and provides a work plan specific to a geographically defined watershed area. The watershed planning process characterization of existing condition, identification and prioritization of threats to water quality, defined objectives to address the identified issues, and related remedial and protective strategies. Department and stakeholder-determined priorities should provide a sensible approach and based upon available resources, level of water quality concern, and local buy-in. The WMP sub-watershed priorities should be based on available data, resources, and level of environmental interest and concerns. All watershed planning activities should be prioritized to meet short-, mid-, and long-term watershed

objectives. The WMPs as well as the overall WQP should be reviewed and revised following the five-year schedule.

Both the WQP and nine-element WMP documents, are dynamic and should be allowed to mature over time as new information, data, and resources become available, incorporating opportunities when they are available and developing areas that need to be, based on the status of relevant components and prioritization of each 12-digit HUC. Additional details regarding the watershed planning process and contents of a nine-element WMP are discussed later in this chapter.

The site-specific NPDES permit renewal writing will begin during this phase. In addition, public notice of site-specific NPDES permits will be posted and public meetings scheduled to allow sufficient time for NPDES site-specific permits to be issued/renewed during Phase 5.

During this phase, it will also be critical to start researching available funding opportunities within the department (Source Water Protection, State Revolving Fund, Section 319 Nonpoint Source, Soil and Water) and externally (EPA, Natural Resources Conservation Service (NRCS), local/state initiatives) to determine the timing of funding availability, to allow a reasonable planning and implementation.

### ***Phase 5 - Implementation***

**Responsible entities:** Regional Watershed Coordinators, Regional Water Pollution Liaison, Stakeholders, Partner Agencies, Water Protection Program (State Revolving Fund, 319 NPS Program, and Permits Units), Source Water Protection, Soil and Water Districts, and Other Local Governmental Entities

Upon completion and local acceptance of a nine-element WMP, the plan is then to be implemented. During this phase multiple actions may begin in coordination with partner agencies, local support, and relevant stakeholders, within the priority watersheds. In cases where the development of a nine-element WMP could not be completed, activities to move toward that goal should be included under the WQP by 12-digit HUC level section.

Implementation activities should be based upon the goals and objectives stated within the WMP. Ideally, the first focus will be on the short-term goals, and then will move forward to achieve the long-term goals for the watershed. The schedule of activities should be flexible, allowing work at both the 8-digit HUC scale (e.g., NPDES permit synchronization, ordinance development, education and outreach) and within a sub-watershed or critical area(s).

Activities may include:

- Conducting education and outreach to promote broad public understanding and participation
- Reissuance or denying regulatory permits such as site-specific NPDES permits for wastewater discharges
- Awarding grants to facilitate implementation of best management practices
- Funding and constructing pollution control abatement facilities
- Implementing pollution prevention plans – stormwater plans
- Developing and implementing provisions of source water protection plans
- Assisting with revising regulation, statutes, and ordinances as needed
- Sharing information among partners and stakeholders regarding activities
- Addressing compliance issues or concerns
- Providing technical assistance to stakeholders, including environmental information to the economic development community
- Coordinating with the Soil and Water Conservation Districts regarding conservation and environmental needs

#### *Statewide Management Activities Component*

Statewide Management Cycle Schedule Component: This component provides an overview of the management cycles for each of Missouri's 66 management units. A general schedule will be developed to provide an outline of recommended activities over the five-year management cycle to balance WPP workloads from year to year (Appendix D). In addition, the WPP and other water programs will also be charged with developing program-specific schedules for each group of watersheds entering into Phase I.

In order to move toward NPDES site-specific permit synchronization, which is a key element that opens additional opportunities in the watershed-based permitting approach, the department needs a mechanism to manage the added workload of permit renewal that some states have found impeded initial efforts moving toward permit synchronization. The department's approach to managing the workload will be to group watersheds into five groups, managed at the 8-digit HUC scale. Each of these groups will begin to move successively through a five-year cycle, with a new group beginning the cycle each year. By distributing the 13, 8-digit HUC watershed groups throughout each of the department's five regions, the permit synchronization framework allows the workload for inspections, which correlate to the permitting effort to be evenly distributed and manageable. The details of this approach is outlined in Appendix E, which provides a process for initiating the five-year phased rotation for NPDES site-specific permit inspections and water quality monitoring, public notice, and permit renewal/issuance.

The department recommends a five-year framework to coincide with the NPDES permitting requirement schedule as discussed early when defining a management unit cycle. As stated previously, the five groups of watersheds were chosen to accommodate department workloads (e.g., NPDES permit inspection, water quality and compliance monitoring), providing a relatively even distribution across each of the five regional office boundaries (Table 1 and Figure 3).

**Table 1: List of Hydrologic Unit Codes within the each of the Watershed Groups and Responsible Region**

<b>Group 1</b>				<b>Group 2</b>			
<b>HUC-8</b>	<b>HUC-8 Name</b>	<b>Square Miles</b>	<b>Region</b>	<b>HUC-8</b>	<b>HUC-8 Name</b>	<b>Square Miles</b>	<b>Region</b>
07140104	Big (OMW)	970.4	SERO	10300101	Lower Missouri-Crooked	2697.6	KCRO
10280103	Lower Grand (OMW)	2358.8	NERO	10270104	Lower Kansas, Kansas*	1655.6	KCRO
11070207	Spring (OMW)	2588.8	SWRO	07110008	Cuivre	1261.5	SLRO
07140102	Meramec	2149.6	SERO	10290106	Sac	1969.3	SWRO
10240011	Independence-Sugar	1042.1	KCRO	07110004	The Sny	1986.8	NERO
07110001	Wyaconda - Fox Rivers	1725.5	NERO	07140105	Upper Mississippi-Cape Girardeau	1729.3	SERO
07140107	Whitewater	1193.5	SERO	08020203	Lower St. Francis*	3581.3	SERO
11010010	Spring	1214.5	SERO	10290203	Lower Gasconade	1032.5	SERO
07110005	North Fork Salt	893	NERO	11010008	Current	2618.3	SERO
07110003	South Fabius	619.4	NERO	11010009	Lower Black*	818.5	SERO
10290102	Lower Marais Des Cygnes	1575.9	KCRO	10280102	Thompson	2199.6	NERO
10290103	Little Osage	580.7	SWRO	10290110	Niangua	1028.5	SWRO
10240013	One Hundred and two	776.4	KCRO	11010001	Beaver Reservoir	2552.8	SWRO
<b>Group 3</b>				<b>Group 4</b>			
<b>HUC-8</b>	<b>HUC-8 Name</b>	<b>Square Miles</b>	<b>Region</b>	<b>HUC-8</b>	<b>HUC-8 Name</b>	<b>Square Miles</b>	<b>Region</b>
10300102	Lower Missouri-Moreau	3398.3	NERO	10300200	Lower Missouri	1590.4	SLRO
07140103	Bourbeuse	843.4	SLRO	08020204	Little River Ditches	2608.1	SERO
07110009	Peruque-Piasa	669.2	SLRO	10290108	South Grand	2046	KCRO
10240012	Platte	1663.6	KCRO	07110007	Salt	793.7	NERO
11010007	Upper Black	1925	SERO	10280203	Little Chariton	698	NERO
10290107	Pomme De Terre	845.2	SWRO	11010002	James	1455.5	SWRO
10290201	Upper Gasconade	1786.4	SWRO	10300103	Lamine	1110.9	KCRO
11010003	Bull Shoals Lake	2604.5	SWRO	10290111	Lower Osage**	1077	SERO
11010011	Eleven Point	1202.3	SERO	10280201	Upper Chariton	1351.1	NERO
08020302	Cache*	2007.5	SERO	11070206	Lake O Cherokees*	909.2	SWRO
8010100	Lower Mississippi-Memphis*	1098.9	SERO				
10240010	Nowaway	999.2	KCRO				
10240005	Tarkio-Wolf	1701.1	KCRO				
10240004	Nishnabotna*	175.1	KCRO				
10240001	Keg-Weeping Water*	838.5	KCRO				
07100009	Lower Des Moines*	2140.1	NERO				
11070208	Elk	1025	SWRO				
<b>Group 5</b>							
<b>HUC-8</b>	<b>HUC-8 Name</b>	<b>Square Miles</b>	<b>Region</b>				
07140101	Cahokia-Joachim	1647	SLRO				
10290109	Lake of the Ozarks	1385.5	SERO				
10280101	Upper Grand	3324.1	KCRO				
10300104	Blackwater	1543.1	KCRO				
07110006	South Fork Salt	1213	NERO				
10280202	Lower Chariton	1018.7	NERO				
08020201	New Madrid-St. Johns	689.5	SERO				
08020202	Upper St. Francis	1298.5	SERO				
11010006	North Fork White	1830.1	SWRO				
10290104	Marmaton	1140.9	SWRO				
10290202	Big Piney	754.7	SERO				
07110002	North Fabius	915.2	NERO				
10290105	Harry S	1202.8	SWRO				

\* Small portions of these watersheds are in Missouri.

\*\* The Regional Office with the majority of land mass needs further examination.

## Missouri Eight-Digit HUC Groups and Permits to Synchronize

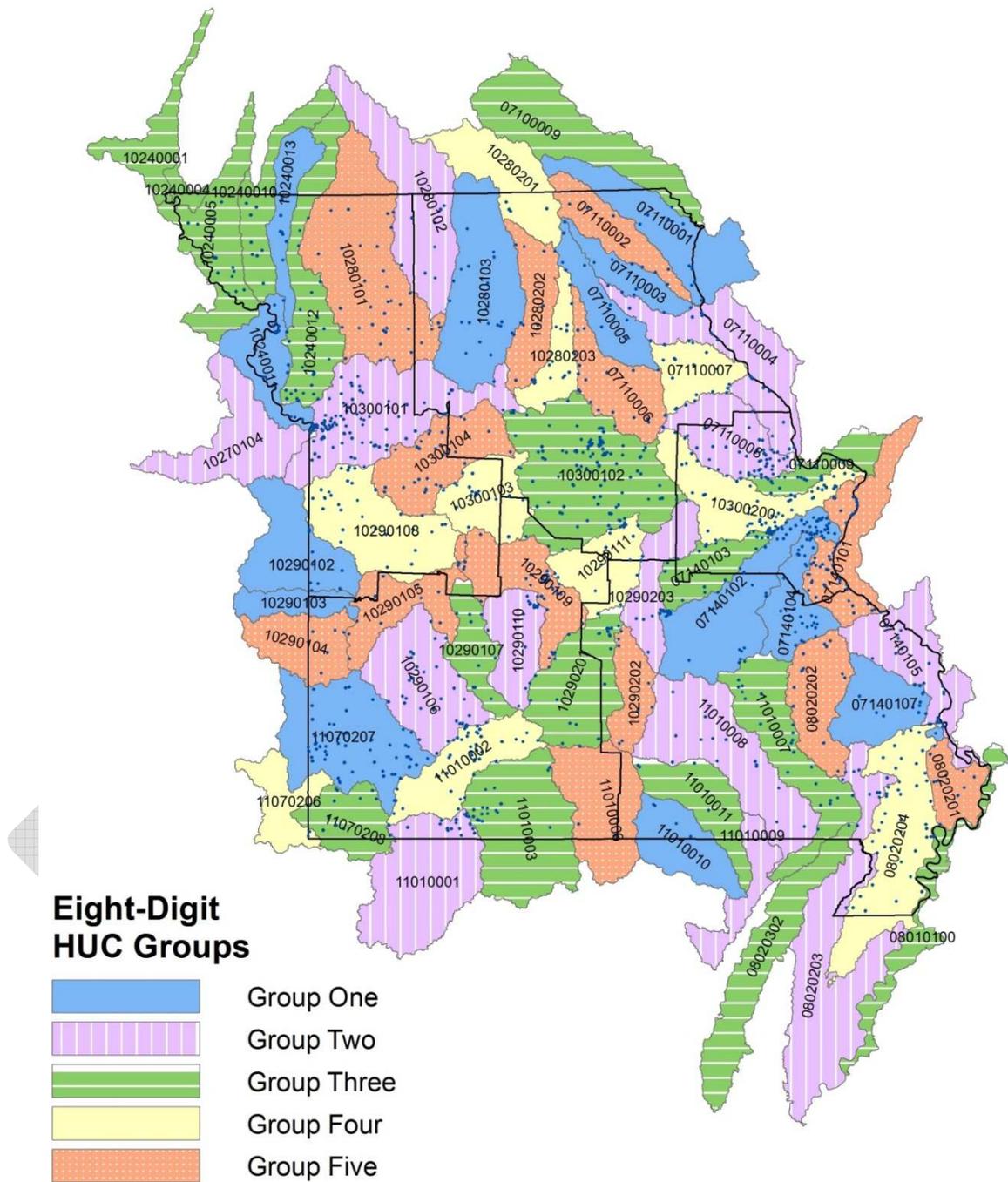


Figure 3. Distribution of Watershed Groups across the State

A schedule provides guidelines for timing of efforts or coordination by the department and WPP, but should also provide flexibility to meet the goals and strategies of the watershed. Initially, the framework will primarily focus on NPDES permit synchronization. As the watershed-based management framework matures over time other WPP and water program activities will be incorporated into the five-year schedule (Table 2). A schedule of planning activities also allows interested entities and partners to coordinate their activities with those of the department. For example, Phase 5 focuses on implementation of on-the-ground management practices which depend upon the availability and timing of funding, and partner participation. Therefore, implementation should be an on-going process, whereas, the framework itself allows for discussion and coordination every five years.

#### *Department Coordinators Component*

To coordinate efforts within the department and within the five watersheds groups, it is important for the department to have dedicated staff assigned and committed to implementing and maintaining the framework into the future. Currently, the department is developing a framework for regional water pollution liaison and regional watershed coordinators. More information will be forthcoming as that framework matures and develops. Below is a brief description of the department's coordinator positions. Additional information is provided in Chapter 3 - Roles and Responsibilities.

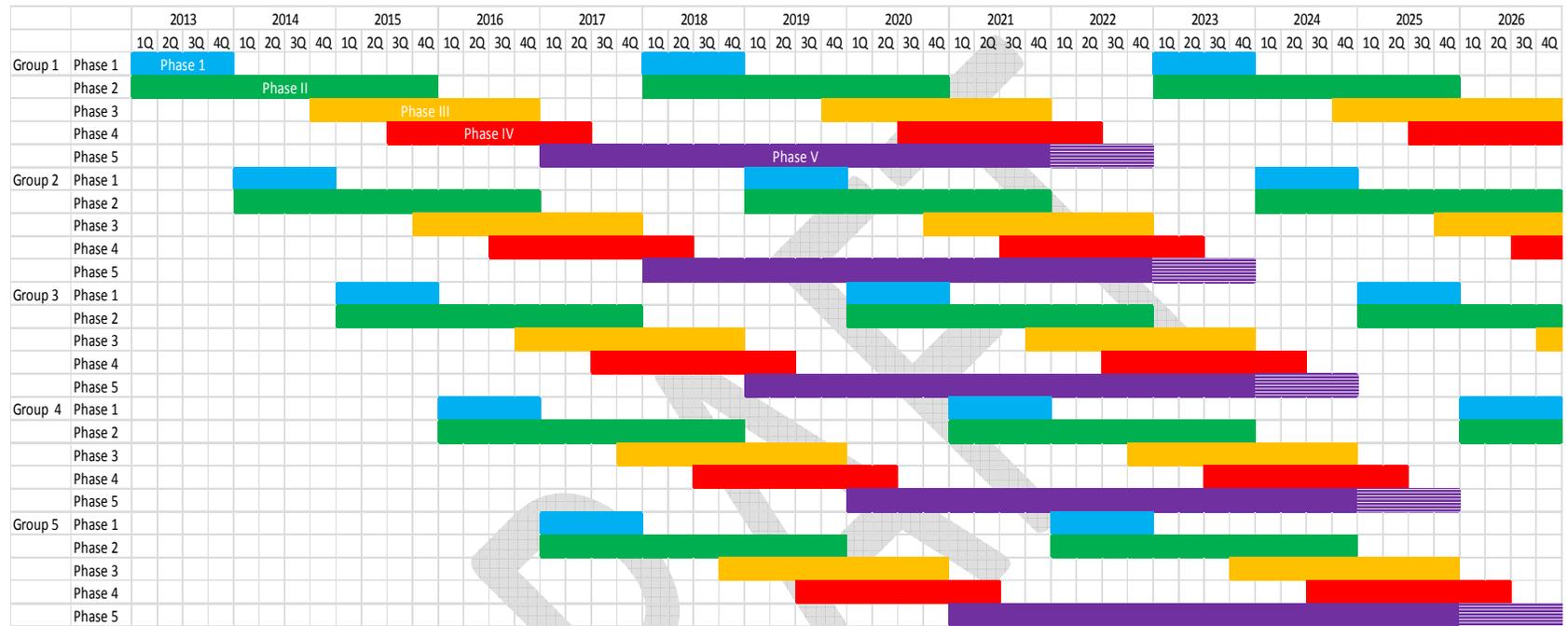
Regional Water Pollution Liaison: Staff will work with WPP, other water programs, and the regional offices to coordinate internal efforts during each phase of the framework and obtain information for the development of the WQP and communicate and coordinate activities among the Regional Watershed Coordinators.

Regional Watershed Coordinators: A regional office staff person has been designated within each of the department's five regional field offices (<http://dnr.mo.gov/regions/regions.htm>), to assist in planning, coordinating, and developing various watershed management activities within their region and in conjunction with WPP and local stakeholders. They will be the first point of contact

for the department, will provide education and outreach activities, attend meetings, and provide support to the local communities within their assigned watersheds.

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**Table 2: Proposed Five-Year Schedule for Water Protection Program Planning Activities**



NOTE: Once a schedule has been developed it will replace the example currently attached as Appendix D.

### *Stakeholder Coordination and Involvement Component*

Establishing watershed stakeholder groups and their involvement is essential to achieving consistent public participation, coordination of resources, sharing of information, streamlining activities, and providing cost-effective solutions. For the success of any framework, WPP, regional offices and stakeholder coordination involvement is important. The department may consider maintaining both a statewide and watershed committee to continuously provide guidance for improving and maintaining the framework and watershed activities (respectively) over time. The establishment of these committees will be necessary to coordinate and streamline activities, and to share information, reduce redundancies and improve leveraging opportunities between agencies or other interested entities. In addition, stakeholders and partners may also help communicate and educate citizens regarding the watershed-based approach and framework.

Formation of external committees should be considered based upon resources and level of effort to maintain interest:

- Statewide committee
- Watershed committees or basin teams
- *Ad hoc* committees or other public forums

### *Watershed Management Unit Plan Component*

Although the watersheds and the permitting effort are cycled utilizing the 8-digit HUC level, this is actually too large an area to develop a nine-element WMP. The three *Our Missouri Waters* initiative pilot watersheds are 8-digit HUCs (as shown in Appendix B including the names of the 12-digit HUCs within each HUC boundary), encompass several 12-digit HUCs. It is not practical to develop detailed nine-element watershed management plans for each of these 12-digit HUCs. Therefore, prioritization at the 12-digit HUC level will be essential. Therefore, a set of criteria will need to be developed for prioritizing watersheds (e.g. watershed is impaired, a TMDL has been developed, there is existing watershed group, etc.). This will provide a water quality basis that will prompt watershed management plan development. For instance, prioritization may be based on existing data, such as the 303(d) or TMDL listed segments.

As the watershed-based management strategy includes stakeholder involvement, local interests and resources in addition to the water quality information available or obtained during the 5-year cycle will also help determine which 12-digit HUCs are prioritized for development of a WMP.

**Water Quality Plan:** An 8-digit HUC watershed management unit planning document coordinates sub-watershed activities at the 12-digit HUC level. The document would be part of the rotating cycle, coordinated by a central coordinator in conjunction with regional water pollution liaison, regional watershed coordinators, and the WPP. Many states developed watershed planning documents to provide an overall management plan that coincides with workload management. As the WPP workload is being managed at the 8-digit HUC level, it also makes sense to manage the various 12-digit HUCs within that 8-digit HUC together. This would be consistent with larger basin plans such as utilized by the State of North Carolina (North Carolina 2012). Water quality analysis and references to developed watershed management plans could be maintained for each priority 12-digit HUC, while an overall plan for the 8-digit HUC could be maintained for purposes of WPP planning activities and departmental coordination.

The information is available for internal and external use in a web-based format and would provide opportunities for stakeholder development through communication links to regional watershed coordinators. WQPs are to be developed as a way to report on activities related to water quality protection and provide status updates on each of the 12-digit HUCs as needed. The WQP should include information on water quality improvements and problems, management strategies, activities accomplished by other federal, state and local governments, research, local watershed activities and permitting, monitoring, nonpoint assessment, planning and other activities. Extensive use of maps and graphics allows for presentation of the information compiled in a user-friendly manner. The purpose of WQPs are used by a wide variety of stakeholders from federal agencies for directing funding to local watershed groups developing WMPs or implementing best management practices or strategies. Refer to Appendix F for an example WQP table of contents page copied from the State of North Carolina called the Broad River Basin-wide Water Quality Plan. North Carolina develops a Water Quality Plan for each of

the 17 basins; however, more detailed WMP's are written for 8-digit HUC or smaller HUCs within the larger basin.

**Watershed Management Plans:** The development of a WMP is a stakeholder driven process and crucial aspect to 12-digit HUC watershed planning. A WMP describes watershed conditions, priorities, specific goals and strategies, and includes a schedule for implementing management practices for the protection or improvement of aquatic resource conditions. It will also be used as a guide for future WPP management activities. When available, the 12-digit HUC WMPs will be referenced in the WQP.



Graphic: U.S. EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters

A WMP describes strategies and provides a work plan specific to a geographically defined watershed area. The watershed planning process includes characterization of existing conditions, identification and prioritization of threats to water quality, defined objectives to address the identified issues, and related remedial and protective strategies. Clean Water Act Section 319 funding requires watershed management plans to have addressed the EPA's nine critical elements. Below are the nine-elements that must be included in a quality WMP and a brief description of the goal of each element:

- Causes and Sources of Pollution – What are the specific causes of pollution or threats to water quality in the watershed?
- Non-point Management Measures – What steps will be taken and where will the focus of those efforts be done?
- Water Quality-based Goals – What are you hoping to achieve?
- Technical and Financial Assistance – How will you fund the implementation of the plan?
- Information and Education –How will you gain support for the plan and its implementation?
- Schedule – How long will it take?

- Milestones – What interim steps will you take toward achieving goals?
- Criteria – How will you know if you are successful?
- Monitoring – What methods of measurement will you use to determine success?

The EPA prepared a report on reviews of the nation’s best watershed management plans titled *Watershed Based Plan Review, Final Report*, July 2011. From the review, EPA provided more educational documents and examples that can be utilized to ensure plans contained adequate discussions on each of the nine-elements. Refer to Appendix G for EPA’s review of the “best” watershed plans from each state.

As the permits and the phases will generally be on a five-year cycle, this period of time is well-correlated to the steps that each group of watersheds must move through in the five years to contribute needed information for the preparation of the watershed management plans. As previously stated, the development of a WMP is a stakeholder driven process. The process allows watershed organizations, governments (local, state, and federal), and interested parties to work together in a coordinated effort to manage water quality issues at the watershed level. The WMP planning process includes activities conducted during Phase 1 through 3, where the WQP details activities and tracks other information collected during each of the phases that can be used to develop a WMP. A WMP documents the expected outcomes resulting from the planning process (Phase 1 through 3) and serves as the action plan for managing aquatic resources. The plan provides an overview of watershed conditions, concerns and issues, strategies for restoring or preserving aquatic resources and outlines a schedule of activities along with potential funding sources. It is recommended that a WMP be developed for each priority 12-digit HUC. However, flexibility for the development of a WMP at a smaller sub-watershed level should be considered based upon resources, available data, priorities, concerns, etc.

Many guidance documents are available to assist with the development of WMPs. Once developed, grant funds or other sources of funding may be available if the plan contains certain elements. For example, if a plan contains nine key essential elements developed by the EPA, the watershed may become eligible for Section 319 Nonpoint Source grant funds to implement the management practices outlined within the plan. Table 3 provides an example of how to

incorporate the EPA’s nine key elements into the watershed planning and implementation process. This is an example of a process that can be followed to aid in the development of a WMP.

**Table 3: Incorporating the *Nine Key Elements* into a Watershed Management Plan**

<p><b>1. Build Partnerships</b></p>	<ul style="list-style-type: none"> <li>◦ Identify key stakeholders</li> <li>◦ Identify issues of concern</li> <li>◦ Set preliminary goals</li> <li>◦ Develop indicators</li> <li>◦ Conduct public outreach</li> </ul>
<p><b>2. Characterize the Watershed</b></p>	<ul style="list-style-type: none"> <li>◦ Gather existing data and create a watershed inventory</li> <li>◦ <i>Identify data gaps and collect additional data if needed</i></li> <li>◦ Analyze data</li> <li>◦ Identify causes and sources of pollution that need to be controlled</li> <li>◦ Estimate pollutant loads</li> </ul>
<p><b>3. Finalize Goals and Identify Solutions</b></p>	<ul style="list-style-type: none"> <li>◦ Set overall goals and management activities</li> <li>◦ Develop indicators/targets</li> <li>◦ <i>Determine load reductions needed</i></li> <li>◦ Identify critical areas</li> <li>◦ <i>Develop management measures to achieve goals</i></li> </ul>
<p><b>4. Design and Implementation Program</b></p>	<ul style="list-style-type: none"> <li>◦ <i>Develop implementation schedule</i></li> <li>◦ <i>Develop interim milestones to track implementation of management measures</i></li> <li>◦ <i>Develop criteria to measure progress toward meeting watershed goals</i></li> <li>◦ <i>Develop monitoring component</i></li> <li>◦ <i>Develop information/education component</i></li> <li>◦ Develop evaluation process</li> <li>◦ <i>Identify technical and financial assistance needed to implement plan</i></li> <li>◦ During the WMP revision stage, assign responsibility to revise the plan</li> </ul>
<p><b>5. Implement Watershed Plan</b></p>	<ul style="list-style-type: none"> <li>◦ Implement management strategies</li> <li>◦ Conduct monitoring</li> <li>◦ Conduct information/education activities</li> </ul>
<p><b>6. Measure Progress and Make Adjustments</b></p>	<ul style="list-style-type: none"> <li>◦ Review and evaluate information</li> <li>◦ Share results</li> <li>◦ Prepare annual work plans</li> <li>◦ Report back to stakeholders and others</li> <li>◦ Make adjustments to program</li> </ul>

The formation of a diverse watershed planning committee is recommended. This committee should also include a technical team who can provide assistance and guidance in evaluating and assessing information, identifying critical areas, documenting water quality conditions, and helping facilitate or coordinate action strategies to improve or protect resource concerns.

Table 4 provides an example of a WMP table of contents borrowed from the department's Section 319 Nonpoint Source Watershed Planning Draft Guidance Template. This template can be used as a starting point for future WMPs to be developed as part of Missouri's watershed-based approach.

**Table 4: Example Watershed Management Plan Chapter Outline**

<p><b>ACKNOWLEDGEMENTS</b></p> <p><b>EXECUTIVE SUMMARY</b></p> <p><b>CHAPTER 1: INTRODUCTION</b></p> <ul style="list-style-type: none"> <li>• PROJECT OVERVIEW</li> <li>• BUILDING THE PARTNERSHIPS</li> <li>• DESCRIBING THE WATERSHED</li> </ul> <p><b>CHAPTER 2: ELEMENT A. - IDENTIFYING IMPAIRMENT</b></p> <ul style="list-style-type: none"> <li>• WATERSHED INVENTORY</li> <li>• IDENTIFYING NONPOINT SOURCE STRESSORS</li> <li>• IDENTIFYING POINT SOURCE STRESSORS</li> <li>• IDENTIFYING CRITICAL AREAS</li> </ul> <p><b>CHAPTER 3: ELEMENT B. - ESTIMATING LOAD REDUCTIONS</b></p> <ul style="list-style-type: none"> <li>• CALCULATING LOAD REDUCTIONS</li> </ul> <p><b>CHAPTER 4: ELEMENT C. - MANAGEMENT MEASURES</b></p> <ul style="list-style-type: none"> <li>• CHOOSING MEASURES TO APPLY</li> </ul> <p><b>CHAPTER 5: ELEMENT D. - TECHNICAL &amp; FINANCIAL ASSISTANCE</b></p> <ul style="list-style-type: none"> <li>• IMPLEMENTING THE MEASURES</li> </ul> <p><b>CHAPTER 6: ELEMENT E. - PUBLIC INFORMATION &amp; EDUCATION</b></p> <ul style="list-style-type: none"> <li>• DETERMINING THE I/E GOALS AND OBJECTIVES</li> <li>• TARGETING THE AUDIENCE</li> <li>• CREATING A MESSAGE</li> <li>• PACKAGING AND DISTRIBUTING THE MESSAGE FOR VARIOUS AUDIENCES</li> <li>• EVALUATING THE I/E PROGRAM</li> </ul> <p><b>CHAPTER 7: ELEMENT F. - SCHEDULE</b></p> <p><b>CHAPTER 8: ELEMENT G. - MILESTONES</b></p> <ul style="list-style-type: none"> <li>• SETTING GOALS &amp; SELECTING INDICATORS</li> </ul> <p><b>CHAPTER 9: ELEMENT H. - PERFORMANCE</b></p> <ul style="list-style-type: none"> <li>• ENVIRONMENTAL INDICATORS</li> <li>• SOCIAL INDICATORS</li> <li>• PROGRAMMATIC INDICATORS</li> </ul> <p><b>CHAPTER 10: ELEMENT I. - MONITORING</b></p> <ul style="list-style-type: none"> <li>• MONITORING INDICATORS</li> </ul>
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• EVALUATING & ADAPTING THE PLAN  
**APPENDIX**

The WPP, Section 319 Nonpoint Source grant program has developed a template of a WMP along with other guidance documents to assist stakeholders and watershed groups through the watershed planning process. Again, this information can be used as a starting point for watershed management planning.

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## Chapter 3 – Roles and Responsibilities

### Overview of Roles and Responsibilities

Identifying key roles and responsibilities is necessary for any watershed planning effort and is essential for long-term sustainability of the framework. Knowing when an activity is planned and by whom allows stakeholders and partners to become actively involved in the coordination and planning processes during all phases of the framework.

The information presented within this chapter will outline several activities focusing on those that are associated with the site-specific NPDES permit renewal/issuance schedule. The information will not dictate WPP responsibilities, but provides an overview of current activities and where opportunities for coordination exist in an effort to enhance watershed improvement activities. Much of the information provided within this chapter was obtained from staff located within the water programs, sections, and units. Other program roles and responsibilities will be included and the information refined as the framework matures over time. It is recommended the water programs develop specific planning schedules for each of the watershed groups entering into Phase 1 of the watershed management cycle these schedules could be incorporated in WQP's.

As discussed previously, the implementation of the framework will require a change in mindset within the department. While the roles and responsibilities of each program remain the same, the framework allows the opportunities for open communication and coordination as each group of watersheds rotate through the five-year cycle described in Chapter 2. WPP staff and other related programs should meet at least annually to discuss and develop five-year planning objectives for each watershed and to develop work plans to meet the objectives. Planning across a designated time span (e.g., three to five years) allows for the flexibility to conduct activities over multiple years when conditions are favorable (e.g., low flow surveys) while also allowing sufficient time for permit staff to conduct data assessment/reviews prior to NPDES permit renewal/issuance. This structure provides a five-year outlook to view and assess the overall health of a watershed and to address those issues on a watershed basis when possible. General watershed information for each of the 66, 8-digit HUC watersheds will be required to fully

initiate and implement the framework and to begin the development of WQPs. For example, WPP data may include but are not limited to land use conditions, water quality monitoring type and site locations, biocriteria monitoring site locations, NPDES site specific permits, 305(b) assessment information, location of 303(d) water body impairments, TMDL information, management practice implementation locations and tracking, watersheds with nine-element watershed management and source water protection plans, and identification of department priorities and initiatives. In addition, having this information available in an easily accessible form (e.g., GIS interactive mapping system) and location (e.g., web-based) will ensure staff have the tools and the resources to determine watershed needs, and will allow for more effective communication, coordination, and data sharing both internally and externally of the department.

Information in the following sections was provided by various programs within the department. A watershed-based management framework cannot be developed without input from key department programs involved in monitoring and assessment, planning, and permitting. Therefore, the programs were introduced to the general concept of the watershed-based management framework and were asked to provide input on how their current program activities could be incorporated into a five-year rotating watershed cycle. The information provided by the water programs is preliminary at this time and is expected to be refined in the future. Each of the department's major water program's general roles and activities are summarized below, describing how their current activities fit the five-year cycle. It will be the responsibility of the programs themselves to plan, coordinate, and conduct specific activities within each of the watershed groups entering into Phase 1 of the framework (see Table 2 in Chapter 2).

### *Roles of Water Protection Program*

Grouping of watersheds in a five-year rotating cycle will enable permit synchronization and the coordination of other WPP activities (such as watershed planning, assessment, TMDLs, water quality monitoring, and funding opportunities) as needed to address the water quality concerns and issues of the watershed. To reach the long-term goal of watershed-based management, the WPP will be required to coordinate all statewide watershed activities over a five-year timeframe where detailed work plans and quality assurance project plans (QAPPs) are developed annually to meet the five-year planning objective. It is essential that there is annual coordination between

permitting, water quality monitoring and assessment, TMDL development, and other WPP activities to develop five-year watershed planning strategies for inclusion into the WQP for all Phase 1 watershed groups. Five-year planning activities include, but are not limited to assessment and data analysis, permitting, WPP and watershed planning, water quality monitoring, and management practice implementation. Continuous coordination of all these activities, the central office staff that conduct them, and the activities of regional office staff will be an intricate and complex undertaking. The Watershed-Based Management Team suggests a central office position be created with this as their primary job duty. A statewide watershed coordinator will bring focus, direction, drive, and consistency to the watershed coordination efforts at all steps of the process.

### ***Assessment and Data Analysis***

Assessment activities may focus on a variety of issues such as identification and level of impairment, evaluation of water quality improvement due to project implementation efforts, and long-term monitoring to track watershed health and trends. These are generally conducted by the Water Quality Monitoring and Assessment unit. Existing watershed and water quality data for the 8-digit HUCs will be evaluated every five years (during Phase 1) to determine the overall watershed health as new data is received and/or as best management practices are implemented. Currently, several internal processes can be used to provide assessment data information on watershed health. The Water Quality Monitoring Assessment Unit along with other key water program staff will evaluate data gaps and the WPP's data needs will be identified. Phase 2, will allow the WPP and related programs to plan and conduct data collection activities to meet the needs of the watershed. Due to the department resources and the size of 8-digit HUCs, sub-watersheds may be selected and prioritized to evaluate impaired waters on a five-year cycle. These sub-watersheds will be selected by the WPP and other programs based on data needs, concerns or issues, impairment, water quality standards, opportunities for improvements based on support by watershed groups and local government, and other criteria determined by WPP and stakeholder input.

## ***Water Quality Monitoring***

### **Water Protection Monitoring Strategy**

Monitoring needs are largely dependent on and driven by data needs for decision making, assessments, and baseline data to meet federal requirements. Data may be collected for multiple purposes that may include: permit and compliance decision making, characterization of background or reference water quality conditions, evaluation of seasonal variations, assessment of water quality trends, Impaired Waters 303(d) and TMDL assessment, development of, refinement of, and compliance with water quality standards, watershed monitoring, and assessment of watersheds to evaluate management practices implemented over a specific timeframe.

Some monitoring components may be used for multiple purposes such as impaired waters evaluation and watershed monitoring. The level and type of data is generally determined by the needs of the WPP during Phase 1 of the framework. For the purpose of this document, monitoring shall be divided into permit and compliance monitoring, impaired waters, and watershed monitoring, which are discussed in greater detail below. It will be the responsibility of the WPP staff and Environmental Services Program (ESP) Water Quality Monitoring Section (WQMS) staff to coordinate data and monitoring activities over the five-year rotation and develop annual work plans and QAPPs as needed with other programs and regional offices to meet the data needs.

### **Permit and Compliance Monitoring**

#### **Compliance Monitoring**

Compliance monitoring may be conducted on a rotating 8-digit HUC approach. Since data will be needed prior to decision making for permitting, this monitoring should be conducted one to two years before permit expiration. This will require coordination from permitting, water quality monitoring and assessment, and regional office staff.

#### **Waste Load Allocations**

Waste load allocations (WLA) may be conducted on a rotating 8-digit HUC approach to support NPDES site-specific permitting. WLA studies are conducted to determine a stream's

assimilation of treatment plant loading and should be done two to three years prior to permit expiration. They may also be used to conduct pre- and post-upgrade to a wastewater treatment facility to determine load reductions. These studies may require multiple years of data collection due to flow and weather impediments during the monitoring season, and time required to calibrate and verify a mathematical model of the stream based upon data needs.

### Low Flow Stream Surveys

The data generated from low flow stream surveys may be used as a screen to conduct rapid assessments on streams and to assess the effective treatment of some wastewater treatment plants. These surveys will be very useful to permitting activities. In some cases, there are very little data available for evaluation of permit limits on small facilities.

### Impaired Waters Sampling

Sampling of impaired waters for the 303(d) list, TMDLs and waters suspected of being impaired, but not listed as impaired due to insufficient data may follow the date of the most current assessment listing by one year. Depending on the study and data needs, more than one year of data collection and interpretation may be required for these assessments. Due to dry or wet years that may not be representative of long-term conditions, or other assessment needs, the WPP staff may require more than one year of data collection. This may include biological assessment, criteria monitoring, chemical monitoring, stressor studies, and other special projects.

### Wadeable Streams

A portion of wadeable streams monitoring may be conducted on a rotating 8-digit HUC approach. These data are primarily used to support a variety of data needs including development of nutrient standards, ambient and baseline data, and long term impairment evaluation. A portion of the wadeable streams data may be collected to support a specific focus in a watershed, or pending data needs. This data may follow a rotating HUC basis to support watershed focus on priority watersheds such as those identified in the *Our Missouri Waters Initiative*.

### Biological Assessments

One of the beneficial use designations specified in Missouri's Water Quality Standards is "protection of aquatic life." In the standards, this designation is specific to warm water biota including, but not limited to, recreationally important fish species. The department currently uses only the *Semi-quantitative Macroinvertebrate Stream Bioassessment Project Procedure* to determine whether a water body is in compliance with this portion of the water quality standards. These biological assessments, therefore, are an important component in determining the overall health of Missouri streams. A portion of these data are used to assess streams for TMDLs, 303(d) listing, and other impairments. A number of these basic biological assessments could be integrated into a rotating basin plan. Due to variability of weather and flow conditions, multiple years of data may be needed for assessment. Biological assessments, including stressor studies or stream studies, are generally multi-year projects and will not necessarily be included in the five-year rotating basin plan.

### Watershed Improvement Monitoring

A portion of this monitoring may be scheduled on a watershed basis to measure a variety of parameters to assess improvements, water chemistry relative to water quality standards, biological supportability, and to collect baseline data. This monitoring may include assessment of management practices implemented through programs such as Section 319 Nonpoint Source grant projects and Soil and Water Program Watershed incentives; or water quality monitoring may be used to generally assess watershed and stream health. The data may be focused on smaller watersheds or on stream segments within priority watersheds (such as the *Our Missouri Waters* initiative). This data is collected by the ESP/WQMS. Biological assessments may be an important component in determining the overall health of Missouri streams and assessment of small watersheds, however, because biological assessments are multi-year, seasonal (fall/spring), assessments are conducted on a stream reach, and the assessment need is driven by the necessity to develop criteria; this type of assessment is not well suited for the watershed-based rotational framework. These projects will be prioritized by the WPP based on department data needs.

### ***Regional Office/Watershed Coordinators***

#### Regional Office Staff

Water quality data may be collected by qualified regional office staff to support the priority watershed focus and to support increased assessment efficiencies. Data may be collected for a variety of projects to support examination of impairment and improvements in watersheds that have been prioritized for resources. Data collection will be prioritized based on data needs by the WPP. Some of the methods and projects that maybe useful are chemical monitoring, compliance monitoring, wadeable streams monitoring, and low flow monitoring. A modified low-flow monitoring methodology for regional office field personal for the collection of macroinvertebrates should be developed to include a standard number of net sets per habitat. For data collection projects that involve the ESP's Standard Operating Procedures, regional staff should be trained and Quality Assurance oversight should be provided by the ESP WQMS staff. Regional staff should report to WQMS on data collection projects to ensure consistency with methods and techniques.

#### Regional Watershed Coordinators

The Regional Watershed Coordinators will engage and coordinate watershed activities at the 8-digit HUC level. Their overarching role will be to provide a personal resource connection between the local communities and the department. They will focus on coordination of activities within the watershed while looking for opportunities to leverage and target resources to improve aquatic resource management. The regional watershed coordinators can assist in tracking and/or coordinating watershed activities during each phase of the framework (Tables 1 and 2) as well as updating the 8-digit HUC WQP in coordination with stakeholders, the Regional Water Pollution Liaison, and the WPP staff, but may provide support for WPP field monitoring and data collection efforts, or organize volunteer groups to collect baseline water quality monitoring.

### ***Volunteer Water Quality Monitoring***

The department may utilize the Stream Team Volunteer Water Quality Monitoring program for statewide data to collect baseline information from key watersheds and/or locations and collect water quality trend data to document gross changes in water quality or fill data gaps. The program gives volunteers the opportunity to progress through four voluntary levels of training. In

addition, the program trains select, willing, and qualified volunteers to collect a higher level of data through the Cooperative Stream Investigation (commonly referenced as CSI) Program. The use of higher level volunteer data collection efforts through the CSI could provide valuable information for the rotational data collection efforts since this program trains volunteers to collect samples according to agency protocols.

### ***Total Maximum Daily Loads (TMDLs)***

Some aspects of the TMDL process may fit within a rotating schedule more easily than others; therefore, the process was separated into four general categories of planning, development, implementation, and evaluation.

#### **TMDL Planning**

TMDL planning would likely occur throughout all phases of the five-year cycle, but annual planning is expected to be focused on goals for developing TMDLs in Phase 4. TMDL planning includes scheduling of water body/pollutant pairs as described on the approved 303(d) list for TMDL development with the goal of having the TMDL developed within 8-13 years of first listing per EPA guidance. The schedule is not static and may be revised annually based on department priorities, data availability, public concern or support, modeling needs, Water Quality Standards revisions, pollutant risk to human health or the environment, and staff workload. The schedule is also adjusted following the approval of revised 303(d) listings, which occurs every two years per federal requirements. Water bodies within the same watershed and with similar pollutants are scheduled for TMDL development concurrently to better expedite TMDL development and to facilitate implementation activities.

The five-year planning schedule can easily be incorporated as an additional factor in planning the TMDL development schedule and would be a significant factor for determining prioritization, but would not be the sole determining factor in scheduling. Should there be adequate data for modeling, priority for TMDL development would likely be given to impairments caused primarily by point sources to facilitate

implementation through the synchronized permitting schedule. Likewise, priority may be given in the case of impairments primarily caused by nonpoint sources, where active watershed plan development or implementation may be occurring. The current 2012 TMDL schedule was developed with considerations given to prioritize impairments within the three *Our Missouri Waters* initiative watersheds.

Because TMDL planning needs are dependent upon available data, as the program's monitoring strategy becomes more aligned with the five-year cycle over a number of years, the TMDL scheduling would naturally fall in line with the cycle as well. Likewise, TMDL planning would also help direct monitoring needs and further direct the scheduling path to a five-year cycle. However, flexibility in planning will still be needed to meet federal expectations or shifting priorities of the department and public.

#### **TMDL Development**

TMDL development is conducted in accordance with the TMDL schedule, but does not follow a set timeline. The time required for TMDL development varies and is dependent upon several factors such as model complexity, staff workload, availability for management review, EPA review, and public involvement. For these reasons, actual development of the TMDL from a draft to a final, approved product may span multiple phases of the five-year cycle; however, only 1 or 2 phases would likely be typical. Regardless, draft TMDLs may still provide some direction and guidance for implementation activities occurring or being planned in Phase 4 or for overall planning in Phase 1.

#### **TMDL Implementation**

The TMDL unit is currently drafting TMDL implementation plans that will follow the approval of a TMDL. These plans will outline the needed reductions and potential strategies necessary to meet the TMDL targets. However, because TMDL development follows a dynamic timeline, so will the implementation plans. Once developed, these

plans would naturally fit as part of the planning process of Phase 1 as well as provide for specific implementation activities to be used in Phase 5.

Actual implementation activities for TMDLs occur mainly through NPDES permitting for point sources and through the Section 319 Nonpoint Source Program or Soil and Water Conservation Program activities for nonpoint sources. Actual TMDL implementation would likely be aligned with the schedules of these types of activities.

### **TMDL Evaluation**

Data collection and evaluation in phases 2 and 3 can be used to determine if implementation efforts are meeting TMDL goals. In many cases where implementation activities are occurring, monitoring will be incorporated into permit requirements for point sources or watershed plans for nonpoint sources. Therefore, TMDL evaluations would follow the schedules of those activities.

### **Permitting**

Permitting will follow a five-year rotation based on the Group Watershed schedule (Appendix E, Draft Permit Synchronization). The transition process is described in more detail in Chapter 4. During the permit cycle, certain activities are required to occur in a sequential order leading up to permit issuance or renewal (e.g., review facility and in-stream data, draft permit, public notice draft permit, and finalize and issue permit). Other activities also have to be conducted in close coordination with the permit section. These activities include, but are not limited to WLA, facility inspections, and TMDL assessment/development where these activities require their own timeline to be coordinated and conducted. These activities should be coordinated during Phase 1 while the actual field activities will be conducted as needed prior to permit issuance or renewal. The field efforts will be coordinated annually and placed in fiscal year work plans and QAPPs.

Permit staff will be required to coordinate with the necessary water programs located within the central and regional offices to conduct water quality monitoring and facility inspections as needed to fulfill information needed for NPDES permit renewal requirements. An annual plan

will be developed for inspection priorities. It is anticipated that priority watersheds will have all permitted facilities inspected two years previous to Phase 5, when permits are reissued.

Overall, it is important to keep in mind that some of the WPP activities will support the framework cycle for decision making such as monitoring, compliance inspections, permit renewal and permit related TMDLs. However, other activities (e.g., NPS TMDLs, 303(d), 305(b)) will be considered and incorporated in the future if and when regulatory requirements or timelines are adjusted.

### ***WPP and Watershed Planning***

As previously stated, many of the WPP planning activities are dictated by federal requirements and schedules such as NPDES site-specific permitting, facility inspections, 303(d), 305(b), TMDLs, and other activities. While some of these activities may fit the five-year watershed-based management cycle, others do not. However, regardless of individual program schedules, planning activities should be conducted during Phase 1 and should focus on watershed management in an effort to make coordinated watershed management decisions, share resources, reduce duplication of efforts, and streamline data collection. This information would be incorporated into the WQP for each watershed entering into Phase 1. A majority of the WPP planning activities should be determined based upon the available data, data needs, the level of issues or concerns, and local stakeholders buy-in. Specific activities should occur based upon the phase of the watershed and in accordance with the permit issuance schedule.

During Phase 4, of the watershed management planning phase, the department, along with key partners (e.g., MDC, NRCS, etc.), shall coordinate and disseminate information in a logical and accessible manner; allowing interested stakeholders to understand, gain information, and become interested in the watershed planning processes. State and other government entities generate technical data as it relates to water quality and watershed health. As part of developing a watershed management plan, agency data and information (water quality assessment data, TMDL, Section 319 Nonpoint Source nine-element watershed management plans, source water plans, MDC watershed inventory and assessments, NRCS Watershed Conservation Plans) can be

used to provide general watershed characteristics (soil types, geology), water quality health, aquatic life conditions, impairments, potential sources of impairments, pollutant load estimates, and pollutant load reductions goals. With this information watershed stakeholders can formulate a planning document to communicate watershed issues, the extent of the concern(s), the goal for the watershed, and what can be done and implemented to address watershed concerns. The planning document would suggest funding sources and timelines, and types of education and outreach programs that can be conducted throughout the watershed to obtain local interest and buy-in. Through the watershed management planning process the watershed may then be eligible to apply for various funding opportunities and cost-share programs (Section 319 Nonpoint Source Grant, Source Water Protection, Soil and Water Conservation, and State Revolving Fund Programs) to implement management practices to improve the overall health of the watershed.

#### *WPP Funding Sources to Implement Management Practices*

As stated previously, various state funding sources are available through the Section 319 Nonpoint Source Grants, Soil and Water Conservation, State Revolving Fund Programs and PDWP source water protection. Summaries of the department funding sources are described below. To improve the health of the watersheds, funding is necessary to allow local entities to implement practices to improve or preserve watershed health. With limited funds and resources, however, it is extremely important to coordinate and prioritize funding sources to obtain the largest environmental impact. Initiatives such as “*Our Missouri Waters*” help focus, prioritize, and address water quality concerns on a watershed by watershed basis. The grant programs described below provide various opportunities for entities to obtain funds to implement several management practices to address watershed concerns. Each program shall be responsible for communicating and promoting their respective funding programs.

The funding sources below have their own funding schedule; however, Phase 5 of the rotating cycle allows the opportunity for stakeholders, interested and eligible entities along with the department to plan and coordinate implementation of management practices as schedules allow.



### ***Section 319 Nonpoint Source Grant Program***

The department receives annual federal funds from the EPA to support the Section 319 Nonpoint Source Grant Program. The purpose of this program is to address nonpoint source issues.

Currently, this program provides three sources of funding: minigrants, watershed planning grants, and implementation grants. Additional information about the three funding sources and schedules, along with program requirements, can be found at the following web site:

<http://dnr.mo.gov/env/wpp/nps/index.html>.

### ***State Revolving Fund Program***

#### **Wastewater**

The department receives annual federal allocation through an EPA Capitalization Grant that supports the State Revolving Fund (SRF) Program. The program provides the states with the flexibility to fund projects that address their highest-priority water quality needs. Traditional uses of this program are to build or improve wastewater treatment plants for municipalities; however, new and emerging conservation, agricultural and urban projects can also be funded through the Clean Water State Revolving Fund. The SRF Program offers low-interest loan and grant opportunities based upon a competitive process following a priority point ranking system. The SRF Program offers a leveraged loan and interim direct loan program, direct loan program, small borrower loan program, and nonpoint source loan program. Additional information about the program and requirements can be found at the following web site:

<http://dnr.mo.gov/env/wpp/srf/wastewater-assistance.htm>.

#### **Public Drinking Water**

The department also receives an annual federal capitalization grant for the Drinking Water State Revolving Fund Program. The department has developed a priority system for funding projects based upon three required criteria from the Safe Drinking Water Act. Priority must be given to eligible projects that address the most serious risk to human health, ensure compliance with the requirements of the Safe Drinking Water Act, and assist systems most in need, on a per household basis, according to state-determined



affordability criteria. Additional information about the program and requirements can be found at the following web site: <http://dnr.mo.gov/env/wpp/srf/drinkingwater-assistance.htm>.

#### **Storm Water Financial Assistance**

In the past, through bond sales, funds have been available for storm water planning and construction projects in first-class counties and the city of St. Louis. The storm water funds are allocated through a formula in the state constitution. The formula allocates the available funds to first-class counties based on the applicant's population. Currently, the 17 first-class counties in Missouri are: Boone, Buchanan, Callaway, Camden, Cape Girardeau, Cass, Clay, Cole, Franklin, Greene, Jackson, Jasper, Jefferson, Platte, St. Louis, St. Charles and Taney. Currently grant funds are not available for this program. Additional information about the program and requirements can be found at the following web site: <http://dnr.mo.gov/env/wpp/srf/stormwater-assistance.htm>.

#### **Section 604(b) Grant**

This funding allocation comes from one percent of the Clean Water SRF. A portion of these funds are passed through to eligible entities (regional planning commissions and council of governments) to carry out a number of water quality management planning activities. Funds can be used to identify the most cost effective and locally acceptable facility and nonpoint measures to maintain water quality standards. They are available for development of an implementation plan to obtain state and local financial and regulatory commitment to implement measures developed under the previous item. Funds can be used to determine the nature, extent, and causes of water problems and, finally, to determine those publically owned treatment works which should be constructed with assistance under the 604(b) title.

#### **Source Water Protection Plans and Abandoned Well Plugging**

The Public Drinking Water Branch has developed and is implementing two grant programs to protect public water systems' source of supply. Grants are provided to



primary community public water systems for developing and implementing local voluntary source water protection plans and projects. Grants are also provided for plugging abandoned drinking water wells. Grants are competitive and are based on a priority point ranking system. This program is currently funded using the Drinking Water SRF set-asides.

### *Public Drinking Water Branch*

The mission of the Public Drinking Water Branch (PDWB) is to ensure the provision of safe and adequate drinking water to Missouri citizens and visitors to the state. To fulfill this mission the PDWB authorizes construction, inspects, permits, oversees monitoring, takes enforcement action, provides technical assistance, and regulates the quality of water produced by public water systems. PDWB also tests and certifies operators of public drinking water facilities.

PDWB permits are one-time permits and monitoring is an on-going responsibility for as long as the entity is a public water system. All public water systems must undergo a sanitary survey on a three- or five-year frequency, depending on the type of system. Otherwise, PDWB does not perform tasks that are cyclical in nature (such as NPDES permits).

### *Source Water Protection*

Source water protection obviously is a good practice that benefits public water systems. PDWB encourages source water protection, although participation by water systems is completely voluntary. PDWB staff assists any water systems wishing to develop a source water protection plan. PDWB has also provides a grant program to provide an incentive to public water systems to participate in source water protection, as described previously.

Watershed protection and source water protection activities are in the interests of all public water systems, especially surface water systems because the more pristine the source water, the less costly it is for systems to treat the water. But regardless of the quality of raw water, public water systems have the responsibility of treating water so that it is safe and meets all standards.

As part of the watershed management framework, PDWB will elevate the importance of public drinking water systems' source water protection plans and will specifically request all new surface water systems compile a source water protection plan.

In developing their source water protection plans, public drinking water suppliers will want to mine the watershed monitoring data that is collected by the stakeholders or government agencies. PDWB will encourage public drinking water suppliers to participate in stakeholder forums for their watersheds that will keep them informed of threats/issues that will degrade or improve their drinking water sources.

Because drinking water source water protection plans are developed voluntarily by water systems, the department will accept them at any time. This means they would not initially be subject to the 5-year cycle for the rest of the watershed. However, PDWB will look at synchronizing renewal of public water systems' source water protection plans so that they are on the same schedule as the rest of the items addressed in their watershed.

### ***Water Supply***

When construction authorization for a new surface water system is requested, PDWB usually requires an engineering study to assess the degree of hazard to the supply posed by agricultural, domestic or industrial contamination sources in the watershed. Sources include municipal and industrial wastewater treatment plants, animal feeding operation lagoons, and accidental toxic spills that may be detrimental to treatment processes. PDWB requires an assessment of all waste discharge (point source and non-point sources) locations that could impact the water supply. Therefore, extensive monitoring may be required to measure turbidity, pH, temperature, and certain chemicals. PDWB also requires a study to obtain samples over sufficient period of time to assess the microbiological and physical characteristics of the water including dissolved gases, chemical, and radiological characteristics.

### ***Water System Permits***

The PDWB issues a Permit to Dispense Water (PTD) to each new water system when the system has completed construction and demonstrates that it can produce safe drinking water and has the technical, managerial, and financial capacity to operate the water system. This is required by the state law. The PTD does not expire, although it can be revoked or suspended for cause. The timing of this permit issuance does not fit into the watershed management approach.

Some public water systems are also required to have an NPDES permit for their filter backwash water. NPDES permit synchronization over a five-year cycle could negatively affect a water system that needs to install a *new* filter backwash system. In these instances, systems may need to obtain a short-term permit. However, full synchronization should be acceptable for *existing* backwash systems.

### ***Soil and Water Conservation Program (external to Water Protection Program)***

The Soil and Water Conservation Program (SWCP) provides financial incentives to landowners to voluntarily implement conservation practices that help prevent soil erosion and protect water resources. By promoting good farming techniques that help keep soil on the fields and waters clean, the program helps conserve the productivity of Missouri's working lands. Funding is provided through the Parks, Soils and Water Sales tax.

The Soil and Water Districts Commission determines allocation of cost-share funds and may decide to adjust funding yearly in support of the implementation phase of the cycle. Programs offered by the Soil and Water Conservation Program include: the Cost-Share Program, which is based on the natural resource concern areas of Sheet/Rill and Gully Erosion, Grazing Management, Nutrient and Pest Management, Sensitive Areas, Irrigation Management, Woodland Erosion, and Animal Waste Management; the Agricultural Nonpoint Source Special Area Land Treatment (AgNPS SALT) Program; grants to soil and water conservation districts for administration, information/education, and technical assistance; research funding to universities; and monitoring, equipment, and technical assistance funding for partner projects such as the NRCS Mississippi River Basin Healthy Watersheds Initiative (MRBI). NRCS initiatives such as MRBI and the National Water Quality Initiative help landowners improve

water quality and aquatic habitats in impaired streams in priority watersheds. Success of these initiatives is heavily dependent upon the delivery mechanism in place through the soil and water conservation districts and support of the SWCP. These partner projects may be incorporated into the planning phase of the five-year cycle and make a significant contribution to the implementation phase. Additional information about the program and requirements can be found at the following web site: <http://www.dnr.mo.gov/env/swcp/>

### *Roles of the Regional Offices*

#### ***Regional Compliance and Enforcement Staff***

Under the department's current organizational structure, regional office staff working in water protection primarily conduct compliance inspections, compliance and technical assistance, investigations, general permit issuance, and discharge monitoring data management. Much of this work is conducted on demand or as dictated by permit reporting requirements or expiration dates; however, many inspections will be conducted to coincide with Phase 3 of the management cycle. Regional staff may be involved in initial watershed assessment activities in Phase 1 as well as effluent monitoring and water quality data gathering in Phase 2 of the cycle. As regional offices are considered the primary field offices, staff is in direct contact with the regulated community and stakeholders on a regular basis. They will conduct a continuous outreach campaign during all phases of the management cycle.

#### ***Regional Water Pollution Liaison***

Directors of the five regional offices serve as regional office liaisons to the Water Pollution Control Branch, the Public Drinking Water Branch, the Air Pollution Control Program, the Hazardous Waste Program, and the Solid Waste Management Program on a rotating two-year basis. The regional director serving as the Water Pollution liaison will act as the intermediary between the WPP (through the program director or assigned WPP coordinator) and staff in the regional office conducting watershed coordination activities. The liaison will be involved with watershed management related issues with the other programs and will help to ensure that regional watershed coordinators are consistent in the execution of their duties. Moreover, the Water Pollution liaison will coordinate with directors and section chiefs from all five regional

offices to ensure that annual work planning of regional responsibilities is aligned with the watershed-based management tasks that are required for the region for that fiscal year.

### ***Regional Watershed Coordinators***

As part of the department's *Our Missouri Waters Initiative*, the department has assigned a regional watershed coordinator to each of the department's five regional offices: St. Louis, Macon, Kansas City, Springfield, and Poplar Bluff. The role and responsibilities of the watershed coordinator is important in all phases of the framework. The watershed coordinators will represent the department in leading the way in coordinating meetings and activities, gathering watershed information, communicating information, conducting education and outreach activities, and providing technical guidance to the citizens and stakeholders within the 8-digit HUCs located within their regional boundaries. Regional watershed coordinators should also assist in coordinating updates to Watershed Management Plans as well as helping to update the Water Quality Plans as directed by the WPP director or WPP coordinator for each 8-digit HUC for which their regional office is responsible, based on information received from other various stakeholders and WPP. Watershed coordinators must not only have the ability to communicate effectively, but also have the technical knowledge of the issues or concerns of the watershed, water quality and other environmental issues, and work with the public and provide technical assistance and guidance as needed. For watershed coordinators to be effective in this position, they will need the tools and resources to easily draw upon.

The overall roles and responsibilities of a watershed coordinator are in development. The *Our Missouri Waters Initiative* will provide an opportunity for the department to explore the role of this position; therefore, additional information will be forthcoming. Described below are suggested coordinator activities as they relate to the five-year phased approach.

- During Phase 1, the watershed coordinators should begin coordinating and seeking outreach and assistance opportunities for watershed residents and community leaders to engage in watershed planning. This effort should continue into subsequent years as needed to keep stakeholders and committees involved and interested.

- Various tools can be utilized to provide stakeholders and citizens with information and knowledge about their watershed. The level of educational outreach and assistance efforts required will be based upon the needs of the watershed. The overall outreach and assistance efforts will help develop and strengthen the leadership capacity in the watershed to conduct sustainable watershed planning, implementation, and evaluation.
- It is essential for watershed coordinators not only to routinely keep abreast of WPP activities, but also to gather information and coordinate with the WPP to further develop or create an inventory of the water resources related conditions and activities (Phase 2). Inventory may include, but is not limited to, demographics, tracking land use, and new NPDES permits. As new information is received, the information should be compiled and incorporated into the watershed management plan (Phase 4).
- During the watershed management development stage, the watershed coordinators, along with key stakeholders and WPP staff, should provide assistance or convene a technical group to provide and explain agency data/studies or reports, recommend processes to monitor and document water quality and watershed changes, and recommend management practices that will improve watershed health. Depending upon the watershed, this level of assistance may vary. For example, tracking water quality changes over time may involve sophisticated monitoring or the utilization of the volunteer water quality monitoring program.

### *Policy and Coordination*

Partnerships with other state and federal agencies are important. As department programs meet to discuss the five-year outlook for each of the Phase 1 watersheds, staff will need to also communicate this information with key partners and stakeholders who have a role to play in each of the Phase 1 watersheds. Coordinating and collaborating data collection efforts to document or determine the overall health of the watershed and gain an understanding of others concerns and priorities requires development of memorandums of understanding or agreement. The department routinely coordinates with various entities to share information. It is important that these partnerships continue.

### *External Roles and Responsibilities*

#### ***Role of the State and Local Stakeholder Forums***

To effectively communicate watershed information, it is proposed that each watershed form a local stakeholder group. The group should be made up of community members (citizens, local governments, etc.) that will lead local initiatives. The responsibility of the group could vary depending on the goals and objectives determined by the group itself. The overall role of the stakeholders and forums are not only to educate and communicate local concerns, but also provide guidance and innovative solutions to address watershed issues/concerns.

#### ***Other Agencies, Stakeholders, and Partners***

To successfully improve watershed health and address priority concerns, it will take a team effort to involve other agencies, stakeholders, and partners to share responsibilities and resources. This includes involving a variety of entities that are located or have a vested interest within the watershed. Their level of involvement in watershed activities will be partly dependent upon the level of communication and coordination provided by the department. The list of stakeholders includes but is not limited to Soil and Water Conservation Districts, NRCS, state and county health departments, Missouri Department of Conservation, universities, the USGS, the EPA, municipalities, counties, business, not-for-profits, watershed groups, and private citizens.

## Chapter 4 – Making the Transition

### Assigning Work Plan Priorities

Assigning priorities can and should be conducted at multiple levels and allow flexibility to meet the needs and goals of a watershed. The WPP and regional offices plan, coordinate, and set workload priorities annually preceding the State of Missouri’s fiscal year (July 1 - June 30).

This level of planning and coordinating effort will be similar as past years, but will be focused to coordinate and conduct activities to occur within the group of 8-digit HUC watersheds as they rotate through each phase of the management unit cycle (Phases 1-5). WPP workload priorities will be determined by the WPP or region. The department intends to coordinate and plan WPP activities over the five-year timeframe, where specific details will be outlined annually through work plans. Other coordination and planning efforts should be conducted at the local level. For instance, prioritization of wastewater inspections and water quality monitoring may be decided by the regional office and WPP staff based upon identified needs, impairment, or TMDL schedule; however, the type, location, and source of funding for best management implementation might be determined at the local level by watershed groups, local stakeholders, local governments or the watershed committee.

### Basin Scheduling Process

During the initial implementation of the watershed-based framework, it will be important for the WPP to organize and coordinate with the various WPP sections and maintain on schedule. The groups of watersheds should be posted to the web and accessible to the public. As each group of watersheds rotates through the five-year management cycle, the WPP sections should provide a five-year schedule of planning activities. These activities (such as those discussed below) shall be coordinated and tracked annually through annual work plans.

### *Outreach to Explain the Watershed-Based Management Framework*

Outreach and education is an important aspect of watershed-based management planning. The watershed coordinators assigned to each regional office will be an important asset to the initial and continued educational campaign of not only the watershed-based management framework, but issues, concerns, and activities occurring through watersheds within their regions. The

regional office staff are the most familiar with the entities (both regulated and non-regulated), issues, and concerns within their regional boundaries and thus are the logical first point of contact. The watershed coordinators along with other department staff should discuss and promote the watershed framework through a variety of venues, such as stakeholder meetings, workshops/conferences, the department website, festivals, and one-on-one/face-to-face meetings, etc.

### *Water Quality Monitoring*

Coordination and planning within the department's water programs should occur annually in preparation of the development of fiscal year work plans for all WPP staff. The level and type of water quality planning per watershed will be based upon 1) the management cycle phase, and 2) the monitoring needs for a particular watershed. Actual work activities to be conducted by regional office staff, central office staff, and Environmental Services Program staff will be described in the WPP annual work plan or quality assurance project plan. The workloads will be planned and coordinated annually in accordance with Missouri's fiscal year (July 1 - June 30).

### *Synchronizing Permits within the Management Unit Cycle*

Because permits are issued on a five-year term, to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is that all permits within an 8-digit HUC and within the larger group of 8-digit HUCs moving through the rotating watershed cycle together will all expire in the same fiscal year. Expirations will be staggered throughout the year to allow permit staff to keep up with the work load. If possible, permits within the 12-digit HUC scale should all expire and be reissued at the same time. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts.

The task of getting all permits in the groups of 8-digit HUCs synchronized will be a five-year task at its core with a small amount of synchronization work extending past that mark. During that time, there will be a larger than usual workload for permit writers since some permits would need to be issued twice in less than ten years. Fortunately, much of the workload increase will be offset with the move of smaller facilities to general permit coverage.

The proposed watershed-based management cycle is a five-year process in which the implementation phase is year five and in which all permits in the 8-digit HUC are renewed. In order to ensure that all permits in Group 1 of 8-digit HUCs are fully synchronized and ready for reissuance during the fifth year of the watershed-based management cycle, the synchronization process must begin one full year prior to implementation of the watershed-based management planning process. Table 5 displays the five 8-digit HUC groups that will have their permits synchronized. The table shows that each group has an initial and a final permit synchronization year. In an ideal situation, all permits would be issued for a full five years in the initial synchronization year such that they would expire and be renewed again during the fifth year (implementation phase) of the watershed-based management cycle. The reality is that many permits are effective until several years after the initial synchronization year, thus a second synchronization year is necessary.

**Table 5: Permit Synchronization Chart Displaying the Five Watershed Groups and the Calendar Years and Fiscal Year Quarters Where Initial and Final Permit Synchronization will Occur**

	2012		2013				2014				2015				2016				2017				2018				2019				2020				2021				2022			
	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q										
Group 1	FY13																				FY18																					
Group 2					FY14																				FY19																	
Group 3									FY15																				FY20													
Group 4													FY16																				FY21									
Group 5																	FY17																				FY22					
	Initial Permit Synchronization Year																Final Permit Synchronization Year																									

A permit synchronization plan has been developed that provides permit staff with specific instructions on whether to renew a permit for five years, allow it to remain expired for up to two years and then renew it for five years in one of the synchronization years, or to renew it for a period of less than five years to expire in one of the synchronization years. Allowing permits to remain expired for up to two years will alleviate some of the duplicate permit work inherent in the synchronization process.

To distribute the permit workload evenly throughout the fiscal year all permits in a group were sorted by their 8-digit HUC and then by the sub-watershed (12-digit HUC). In that order, each 12-digit HUC was alternately assigned a quarter in the fiscal year. If, after assignment, any quarter had more or less permits than the others, adjustments were made to make them equal. The assignments were then used to determine during which quarter in the initial and final permit synchronization years the permits would be renewed.

The following criteria were used to determine the instruction to the permit writer:

- If a permit expires two years or less before the initial or final synchronization quarter it will remain expired until that quarter comes.
- If a permit expires more than two years before the initial permit synchronization quarter it will be renewed for a period of less than five years such that it expires in the initial synchronization quarter. It will then be renewed for a full five years, expiring in the final synchronization quarter.
- If a permit expires after the initial synchronization quarter but more than two years from the final synchronization quarter it will be renewed for a period of less than five years, expiring in the final synchronization quarter.

Group 1 and Group 2 permits will be slightly different from the others. For Group 1, the initial synchronization year begins fiscal year 2013; therefore, there is not enough time to allow permits to expire before the initial synchronization quarter. For Group 2 some permits will be allowed to expire, while according to the criteria should be renewed; however, to fit the five-year management cycle, these permits will remain expired until the initial synchronization year.

*Other Key Processes – National Pollution Discharge Elimination System Facility Inspections, State Revolving Fund Funding, Total Maximum Daily Loads, Section 319 Nonpoint Source, Impaired Waters Listings*

The activities of many of the WPP sections will easily fit into the watershed management cycle and will, in fact, be enhanced by its structure and predictability. Other activities, however, may not align with the five-year cycle because they run under their own cycle or because they are conducted as needed or as issues arise.



- Facility Inspections – The number of inspections that are conducted during a fiscal year is primarily based on the number of permitted facilities and agreements negotiated with the EPA on what percentage of each type of facility will be inspected. Inspections above the agreed percentages are conducted as needed. Since the number of permitted facility is not expected to be affected by the transition to watershed-based management, the number of inspections should also not be affected. During the transition, however, planning of inspections will be based on the permit synchronization schedule such that each facility on that list is inspected at most, two years prior to permit renewal. After the transition and after permits have been synchronized, planning of inspections will be based on the management cycle such that each facility in an 8-digit HUC is inspected in Phase 2 or 3.
- SRF Funding – SRF funding may align with the management cycle well as long as planning is done far enough in advance. Priority points could be given in scoring of applications for prioritized watersheds. Potential applicants would need to know far in advance when their implementation year was for their watershed so they could complete all the preliminary work required to get on the Intended Use Plan for that fiscal year. Fortunately, the predictability of the management cycle makes it possible for communities to plan ahead as far as is needed.
- TMDLs – Much of the planning, development, implementation, and evaluation of the TMDL process will align well with the management cycle. To the extent possible, water bodies should be prioritized during the TMDL planning process based on the cycle. If sufficient data is available in a watershed for modeling, the TMDL development would be prioritized to align with the implementation phase. Since TMDL planning needs are dependent on available data, TMDL scheduling will likely follow the transition of water quality monitoring to the rotating cycle. TMDL development itself, however, may span several management cycles as data is collected and developed. TMDL development may be tied to development of Watershed Management Plans if impairments can be addressed by permit actions for point's source impairments or management practices for non-point source impairments. Implementation of TMDLs naturally fits into the fifth phase of the cycle and evaluation would align with phases 2 and 3.



- Section 319 Nonpoint Source Funding - Section 319 Nonpoint Source Grants may align with the management cycle as long as the watershed is impaired classified as a high priority watershed or has a TMDL or a nine-element watershed plan developed. Of the watershed within the rotation, priority watershed should be identified early in the management cycle allowing eligible entities to obtain and develop partnerships, research appropriate management practices, and obtain landowner buy-in prior to applying for grant funds.
- Impaired Waters Listings (303(d)/305(b)) – Currently, Missouri is required to update the 303(d) and 305(b) lists every two years for approval by the EPA. With a three-year cycle, these activities would not immediately fit into the five-year watershed-based management cycle. Missouri may need to work with the EPA to restructure certain aspects of their relationship and agreements such that activity cycles such as 303(d) listings and Water Quality Standard revisions are synchronized with the watershed management cycle.

### **Watershed Management Plans**

Watershed management plans are living documents. They should be reviewed and revised every five years, which is consistent with the five-year watershed-based management cycle and EPA recommendations for watershed planning. Coordination with other agencies such as Missouri Department of Conservation, which has published many watershed inventory and assessments, will help keep these plans up to date. Some of the major topics can be shared via the Internet. The Missouri Department of Conservation watershed inventory and assessments are located at: <http://extra.mdc.mo.gov/fish/watershed/>.

### **Work Plan Agreements and Local Government Coordination**

Internal and external work plan agreements should be developed, and modified on a five-year basis. Relationships should be fostered between the department and municipal and county governments, as well as regional planning commissions to facilitate data sharing and, leveraging of funds. It also provides continued engagement of local stakeholders and watershed groups during and beyond the five-year management cycle.

## Data Management Considerations

### *GIS Data Layers to Support Basin Planning*

The department currently has access to hundreds of GIS layers containing various types of data that will be valuable during the planning and assessment aspects of the watershed-based management cycle. However, there will be a need for more extensive layers, different layer types, and customized and dynamic layers. Coordination efforts will be needed with other state, federal, and local entities to gain access to layers that are specific to certain 8-digit HUCs or that are currently unavailable for department use. For optimal use of existing water quality and facility effluent monitoring data as well as data that is obtained through targeted monitoring in phase two of the cycle, the development and refinement of layers will be an ongoing process. To ensure consistency, compatibility, and integrity of GIS layers that are developed or modified for these purposes, one staff member should be dedicated as the statewide GIS coordinator rather than multiple staff from different programs working independently.

### *Existing Data Management Structures*

The recent completion of the Missouri Clean Water Information System (MoCWIS) database has significantly improved the department's NPDES permit tracking, and the Water Quality Data System (WQDS) database, which is recently completed, allows staff and the public access to water quality monitoring data for the state.

MoCWIS is an Internet-based application that is used by the Water Pollution Control Branch and regional offices to maintain Water Quality Standards and to manage wastewater permit application and NPDES permit data, as well as water pollution inspections and enforcement.

There are two modules of MoCWIS – Water Quality Standards and Permitting and Compliance.

WQDS is an on-line search of water quality data generated by the DNR Environmental Services Program and other organizations whose data is used by DNR

([http://dnr.mo.gov/mocwis\\_public/wqa/waterbodySearch.do](http://dnr.mo.gov/mocwis_public/wqa/waterbodySearch.do)).

Currently, users must access MoCWIS and WQDS separately to obtain information regarding permitted facilities, water quality standards, stream sample data, stream survey information, etc. Enhancements to MoCWIS or the development of a single user interface that draws information from both databases and any other existing department data sources would prove invaluable in all phases of the watershed-based management cycle. Until such enhancements are made, the department's current Report Portal can be used to create customized reports that draw information from the different data sources.

#### *Watershed-Based Management Public Website*

Informing and involving the general public as well as key stakeholders will be crucial for the successful implementation of watershed management practices and activities. While Regional Office Watershed Coordinators, all other field staff, and program staff that regularly interact with the community will be promoting these efforts and engaging citizens as much as possible there will still be a large segment of Missouri's population that will not be reached by these methods. The department, therefore, should consider developing a watershed-based management website similar to the site that the Tennessee's Department of Environment and Conservation has built (<http://www.tn.gov/environment/watersheds>).

The ideal watershed-based management website would include general information about the concept of and processes involved with and the goals of watershed-based management. The site should describe which 8-digit HUCs are included in each of the five groups and why they are grouped that way. A key element of the site would be an interactive map of Missouri with the 8-digit HUCs overlaid. Each watershed on the map would link to a separate web page with specific information about the 8-digit HUC including but not limited to the following:

- Existing water quality information
- Known water quality issues
- Existing Watershed Groups or Stream Teams
- Interesting or relevant historical information
- Current and past land usage and population demographics
- Lists of all permitted point source discharges and links to their permits



- Water quality goals
- 8-digit HUC WQPs and links to individual WMPs for 12-digit HUCs or smaller geographic areas
- Watershed Coordinator contact information

As a means of gathering input from the public, users of the individual 8-digit HUC pages should have the ability to submit comments, concerns, and ideas or to get involved in the management process easily from that page.

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## Chapter 5 - Challenges and Keys to Success

### Challenges

Implementing the watershed-based management framework will require a change in the way the department and the programs operate. The department's environmental managers have a key role in developing and implementing the framework. Table 6 lists some of the issues and challenges that personnel will face during framework implementation. Some of the key challenges that might be encountered within phases of the proposed framework's management cycle component are discussed in subsequent sections.

For success of any watershed-based management framework, the framework itself should provide flexibility to adapt to unexpected delays and events. The framework must provide the ability to correct processes and adjust as needed within both a five-year timeframe and a specific phase. The Department should continually assess resources necessary to maintain and support the framework, refining activities as necessary to ensure open discussion and coordination of efforts to continue into the future. The development of an internal framework policy may be necessary to discuss program responsibilities, coordination of activities (internally and externally), allocation of resources and staffing, methods for prioritizing activities or watersheds, communication of program activities, and development of a schedule to evaluate and update framework as needed.

#### *Phase 1 – Planning & Preliminary Assessment*

Communicating and documenting data and assessment needs allows for complete participation and collaboration among stakeholders. Early and frequent collaboration provides opportunities for interested entities to work together to establishing short-, mid-, and long-term goals and solutions for the watershed.

Establishing or re-establishing partnerships with key agencies (local, state, and federal governments) will be essential to sharing and coordinating planning efforts. Aligning priority efforts between partnering agencies may be difficult due to differences in agency mission,

prioritization strategies, watershed goals, objectives, etc. Maintaining long-term partnerships and interests may be an effort for all partners.

A challenge to the establishment of the framework for a watershed is the lack of established watershed groups or the ability of entities within the watershed to implement voluntary activities. In this case, staff will need to allow Phase 1 at least two or more years for watershed or stakeholder group formation and landowner buy-in. Before a watershed is targeted for planning efforts, an aggressive educational campaign and marketing strategy may be necessary preceding this phase to gain interest or identify entity(ies) to plan and implement voluntary activities.

In recent discussions with other states who have implemented a watershed-based approach, many have indicated 8-digit HUC may be too large. Depending upon the watershed characteristics and the amount of available data, information and staffing resources may not be enough to properly plan and implement management practices at the 8-digit HUC level within a short timeframe. Again, the recommendation is for the framework to provide flexibility to meet the needs and goals of specific watersheds and the consideration of focusing resources and efforts on smaller scales where necessary. Focusing efforts on a smaller geographical region or subwatershed (e.g., 12-digit HUC) will be useful for local governments and conservation programs, and offer stakeholders different levels at which to manage water quality concerns.

### *Phase 2 – Data Gathering*

Partnering and coordinating the data collection efforts with interested entities is important to any successful watershed-based management approach. It reduces redundancy (duplication of efforts), and has the potential to streamline activities both internally and externally. Actively maintaining collaboration, interests, and commitment in the long-term may be a challenge. Setting up official agreements with key entities/agencies that share similar interests and goals should be considered.

Data collection efforts can be very extensive depending upon the complexity of the watershed (e.g., urban areas); therefore, flexibility will be needed to focus efforts within priority sub-

watersheds (12-digit HUCs or smaller). The needs of each watershed should be considered on a case-by-case basis in coordination with key stakeholders and WPP.

Consideration:

A five-year work plan for NPDES site-specific permit inspection and monitoring activities will be developed during Phase 1, while monitoring activities will be conducted in Phase 2.

Monitoring activities will include, but not limited to, facility inspections, facility effluent and receiving stream water quality monitoring as necessary or required by the NPDES permit program. This phase will provide allowances due to unforeseen circumstances such as extreme weather events that may prevent or delay inspection and monitoring within a 12-month (or other specified) timeframe. These efforts may overlap into Phase 3 yet allow sufficient time for data evaluation (Phase 3) to be completed prior to the permit renewal schedule.

*Phase 3 – Data Evaluation*

Assessing available data at an 8-digit HUC scale may not be reasonable due to the lack of information or the level of resources needed to obtain the information. Many states have indicated that during the initial planning stages, sufficient staffing resources required to thoroughly assess watersheds are often not considered or realized. In addition, assessments need to maintain flexibility because each watershed is dynamic. Data evaluation may encompass either one or both a qualitative or quantitative assessment based upon available data and needs.

Considerations:

Staff in this phase will also perform TMDL and WLA analysis for the permitting process; therefore, we will need to assign responsibilities within the permitting group. On a related topic, a watershed analysis, which refers to an analysis of pollutant sources and loadings (similar to a TMDL), may need to be completed for a watershed where a TMDL is not required or where a TMDL has not been performed. A watershed analysis is used to determine appropriate water quality based effluent limitations (WQBELs) for point sources in a watershed. The department should consider if watershed analyses for permits should be conducted and incorporated within the watershed-based framework.

#### *Phase 4 – Plan and Strategy Development*

Much of the information needed for this phase has been gathered during Phases I, II, and III. The planning phase will require internal coordination to streamline WPP activities and implementation strategies (SRF, 319, Soil and Water, Source Water Protection, Missouri State Parks, 303(d), 305(b), TMDL, etc.). External coordination with key stakeholders shall also be sought and/or tracked to document watershed achievements.

Establishing steering, technical, and watershed committees and keeping them organized and on track can be a time consuming process. Other states have indicated the time and resources that were devoted to this effort were heavily under estimated or valued. Maintaining long-term stakeholder interest and partnerships over several years can be a daunting task.

Essentially, the NPDES site-specific permit renewals will begin to be drafted during this phase. The preceding chapters provided details regarding the permitting process. During this phase, public notice of NPDES site-specific permits and hosting public meetings will be scheduled and conducted.

#### NPDES Permitting activities considerations:

NPDES permitting programs in other states have maintained that watershed -wide permitting can result in a more strategic and efficient permitting program, greater stakeholder involvement, and more effective and equitable permit limits (US EPA 2002). The watershed-wide planning process provides communities with a process and a timeline to address water quality issues. The watershed-wide permitting process allows permittees to compare their permits and limitations with other dischargers in the same area and where possible create limitations that are more equitable. As an example, in North Carolina (NC Department of Environment and Natural Resources, DWQ) the process has afforded the formation of associations of watershed dischargers. The Neuse River Compliance Association was North Carolina's first association to form to address in a collaborative effort the need to reduce total nitrogen loading in the Neuse River Basin (US EPA 2003). These associations are nonprofit, private, voluntary groups whose members hold individual permits. A watershed permit that addresses a specific pollutant, such as total nitrogen, may be the result of the association. In addition, water quality trading was

involved in the watershed permit. In the Penobscot River Basin, the Penobscot River Basin Discharger Council (ME DEP 1998) was formed to review and evaluate available water quality, meet and discuss TMDL development with the Maine Department of the Environment, comment and provide input on river water quality assessment work plans, and coordinate and assist with data collection. For more information, see the article at:

<http://www.lagoononline.com/tmdl.htm>.

Activities associated with NPDES site-specific permitting will initially be a struggle for the WPP as many states have had difficulty with the five-year rotating basin schedule because: 1) dischargers are not distributed evenly across the state, thus there is uneven permitting workload across watersheds; 2) federal initiatives and new programs divert resources away from the watershed permitting cycle; 3) state laws limit the permit terms to not less than five years (this should not be a problem for Missouri as indicated in 10 SCR 20-6010 (10)); and 4) the TMDL process causes problems with issuing permits according to the five-year basin schedule (US EPA 2002; US EPA August 1995).

#### *Phase 5 – Implementation*

This phase will require the needed resources and partners to implement and track progress. Many aspects of the implementation phase cannot be conducted within a one year phase. States with the full range of watershed management components (statewide steering committee, watershed coordinators, basin teams, MUPs and WMPs) appear to be more successful in integrating water program responsibilities and requirements at a watershed level.

#### **Value of interagency and local partnerships**

A key to a successful statewide management program involves recognizing the value of interagency and local partnerships. These partnerships need adequate coordination from a well-defined infrastructure. This infrastructure should not be managed by a single agency but rather managed through partnerships that are integrated into the watershed framework. The framework needs the necessary statewide committees, coordinators, basin teams, and plans to implement the approach. According to the EPA's Review of the Statewide Watershed Management

Approaches (US EPA2002), states that start out with a basic framework for implementing their watershed-based management approach and follow an adaptive management approach in response to local concerns and resources are the most effective.

### *Building support for the watershed approach*

#### ***State commissioners and state legislators***

Building support for the watershed-based management approach with state commissioners and state legislators is recommended to promote watershed-base management and prevent future changes to the framework after it has been initiated. The department should consider developing regulations and or introducing legislation that codifies the watershed management framework or processes. This will help protect management from unpredictable political changes and build public support.

#### ***Policies and regulation revisions***

The Watershed-Based Management Team acknowledges the need for policy changes once the framework is in place and functioning. The permit synchronization and rotating basin schedule is a policy change that will affect the manner in which the WPP conducts business. For instance, monitoring and assessment, permit renewal, inspections, among other activities, will be modified to accommodate the rotating watershed-based approach to managing NPDES site-specific permits. Staff has a number of proposed watershed management implementation plans that will help the WPP and stakeholders address pollution issues. For example, water quality trading will likely require policy and regulation changes prior to implementation.

#### ***Outreach and Training***

The department will continue to learn from the *Our Missouri Waters* initiative. The watershed coordinators that are assigned to each regional office will assume leadership and develop partnerships with federal, state and local representatives. Efforts will be made to include existing watershed organizations, the regulated community and other stakeholders, and seek out strong co-leadership from within each watershed team. Watershed coordinators will be experimenting with outreach and educational campaigns related not only to the watershed-based management

framework but to issues, concerns, and activities occurring in the watersheds within their regions. These personnel are familiar with the both regulated and non-regulated constituents, issues, and concerns within their regional boundaries. Stakeholder meetings, workshops/conferences, the department website, fairs, festivals, site visits, and personal meetings are venues for promoting the watershed-based framework.

Watershed team members will pool resources to assess water quality, determine causes and sources of pollution, prioritize critical sub-watersheds, prioritize restoration/protection efforts and pursue funding opportunities. These teams will also be an educational resource to communities throughout their watershed, enhancing their knowledge and building local capacity in a consistent fashion throughout the state.

Finally, the WPP, Watershed Protection Section should continue the *Internal Watershed Coordination Workgroup* to improve department coordination of nonpoint source pollution efforts. This is a diverse group of staff that could be used as the foundation for the department's internal watershed team. This group may look at individual watersheds to suggest how the department could better coordinate, leverage funding, and implement practices that address water quality concerns.

***Watershed certification/leadership program as watershed group support network***

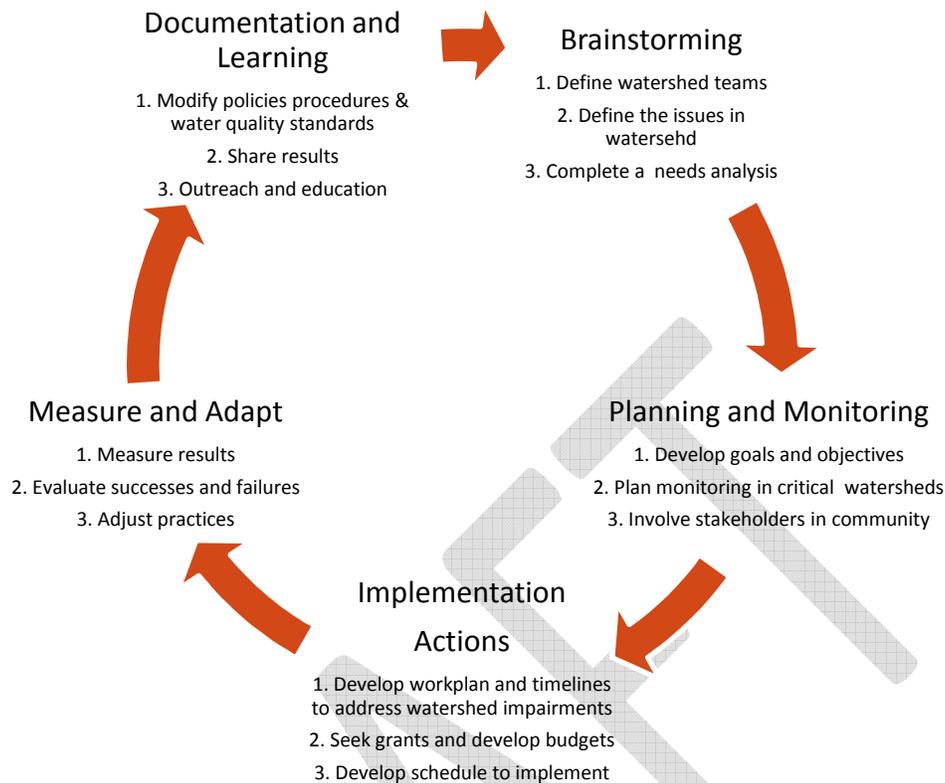
A successful watershed-based management framework should include a watershed certification/leadership program in an effort to build an effective support network for watershed groups. The objective of the program would be to establish collaboration among research and education experts, and watershed groups to establish partnerships with conservation organizations and agencies. This includes networking watershed groups together, and connecting them with existing resources and conservation agency personnel in the state.

<https://engineering.purdue.edu/watersheds/webinars/IWLA2011/>.

One way to establish a network is to have a dedicated email listserv for persons interested in water quality and watershed issues. This listserv would provide an online forum for the exchange of ideas, problems, and solutions.

### **Watershed Framework Self-Assessment and Using Adaptive Management**

The watershed teams will work together as a “Watershed Committee” to assess the appropriateness of existing water quality standards and current conditions within the watershed. The watershed teams will look for innovative ways to improve the existing watershed framework by assessing the strengths and weaknesses of management activities within the phases or with other proposed watershed framework management activities (Figure 4). These teams should be vital in assisting with grant opportunities, as well as identifying unique and innovative solutions to water quality impairments. The team will request targeted monitoring where necessary and inventory point and nonpoint sources of pollutants. The team should also provide the department with a needs assessment and identify critical 12-digit HUC sub-watersheds. Once the watershed has been fully assessed, the team will identify opportunities to address the priority pollutants and develop a schedule for implementing the identified measures.



**Figure 4: Adaptive Management in a Watershed Framework.**

The watershed teams and coordinators should be established such that they are able to use adaptive management to adjust to the many unknowns that we will encounter. Adaptive management has received significant attention within the department recently, especially with regard to reaching resolution of some of our more challenging problems (MDNR 2011a). Adaptive management is designed to work on complex systems where there are important scientific and other unknowns and includes a stakeholder process. Adaptive management is already being used in the Hinkson Creek watershed to learn by doing and more effectively find solutions (MDNR, et al 2011).

Each year over the five-year timeframe watershed groups will be cycled into Phase 1 of the watershed-based framework. As watershed groups cycle through the five phases, the cycle will restart, providing the ability for the department to reassess, track progress, and adapt management of watersheds accordingly based upon new information. The opportunity may arise



to shift the triennial review of some department regulations to watersheds and rotate those as this process matures.

**Table 6: Issues and Challenges Related to Successful Implementation of Watershed Framework**

<b>Issues and Challenges</b>
<ul style="list-style-type: none"><li>• Reduction in funds</li><li>• Insufficient monitoring programs</li><li>• Streamlining programs to fit the new framework</li><li>• Determining who leads and who follows</li><li>• Outreach and education efforts</li><li>• Accepting change or resistance to change</li><li>• Synchronizing procedures and processes</li><li>• Properly trained personnel</li><li>• Active watershed associations and volunteers</li></ul>

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## List of Appendices

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