



Missouri Continuing Planning Process

Missouri Continuing Planning Process Revisions: Open for Public Comment

CPP 2014 Revisions – We welcome comments from the public on the Water Protection Program’s Continuing Planning Processes (CPP). The department will review and make appropriate changes to the Continuing Planning Process based on comments from the public and the U.S. Environmental Protection Agency.

Following the public comment period, comments and responses will be posted to the web.

Comments and questions regarding the 2014 revisions can be emailed to **Continuing Planning Process** or addressed to:

Missouri Department of Natural Resources
Water Protection Program
Continuing Planning Process Coordinator - 4 Central
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The Continuing Planning Process is an informational document for the general public, business and environmental interests, state and local government and the EPA, Region 7, and is prepared pursuant to Section 303(e) of the Clean Water Act.

What is the Continuing Planning Process?

Element 1 - The Process for Developing Effluent Limits and Schedules of Compliance
40 CFR 130.5 (b) (1) the process for developing effluent limitations and schedules of compliance as required by sections 301(b)(1) and (2), 306 and 307 of the Clean Water Act and as required in applicable water quality standards. This element identifies the process for developing effluent limitations and schedules of compliance as required by the Clean Water Act and applicable water quality standards for the program referred to as the National Pollution Discharge Elimination System (NPDES).

Element 2 - The Process for Incorporating Elements of Waste Treatment Plans and Basin Plans
40 CFR 130.5 (b)(2): the process for incorporating elements of any applicable area-wide waste treatment plans under Section 208 and applicable basin plans under Section 209 of the Clean Water Act. Public entities, whether or not they are designated authorities, can take advantage of public funding and financing for regional wastewater treatment facilities. Missouri's delegated funding authority under the Clean Water State Revolving Fund for area-wide waste treatment project loans and grants encourages districts and communities to design and build wastewater treatment collection systems.

Element 3 - The Process for Developing Total Maximum Daily Loads and Water Quality Based Effluent limits
40 CFR 130.5 (b)(3): The process for developing Total Maximum Daily Loads (TMDLs) and individual water quality-based effluent limitations for pollutants as required in Section 303(d) of the Act and Part 130.7 of EPA regulations. This element discusses water quality standards and water quality-based effluent limitations. Total Maximum Daily Loads (TMDLs) are plans established under the Clean Water Act to ensure that a water body will attain and maintain state Water Quality

Standards. The TMDL process begins with the determination of which waters do not meet WQS after the implementation of technology-based controls.

Element 4 - The Process for Updating and Maintaining Water Quality Management Plans
40 CFR 130.5(b)(4): The process for updating and maintaining water quality management plans, including schedules for revision

This element identifies the basic activities/processes for evaluating, updating and maintaining Missouri's water quality, including geographic information systems (GIS), water quality information systems (WQIS) and watershed planning efforts.

Element 5 - The Process for Ensuring Adequate Authority for Intergovernmental Cooperation
40 CFR 130.5 (b)(5): The process for ensuring adequate authority for intergovernmental cooperation in the implementation of the state water quality management program.

This element documents the continuing planning authority for intergovernmental cooperation in the implementation of the state's water quality management program. Water Quality Coordinating Committee Meetings provide opportunities for the public and local agencies and associations to discuss water quality issues and support improvements.

Element 6 - The Process for Establishing and Ensuring Adequate Implementation of Water Quality Standards and Schedules of Compliance
40 CFR 130.5 (b)(6): the process for establishing and ensuring adequate implementation of new or revised water quality standards, including schedules of compliance under Section 303(c)

Under the Clean Water Act, every state must adopt water quality standards to protect, maintain and improve the quality of the nation's surface waters (U.S. Code Title 33, Chapter 26, Subchapter III). Missouri's water quality standards provide the basis for the department's Water Protection Program.

Element 7 - The Process for Ensuring Adequate Controls over the Disposition of All Residual Waste
40 CFR 130.5 (b) (7): The process for ensuring adequate controls over the disposition of all residual waste from any water treatment processing

This element discusses sludge or biosolids. Assuring adequate controls over the disposition of all residual waste or sludge from any water treatment processing is authorized under state authority by adding sludge requirements during the permitting process. Guidance has been developed for permittees designed to promote safe use and disposal of biosolids.

Element 8 - The Process for Developing an Inventory and Ranking in Order of Priority of Needs for Construction of Waste Treatment Works
40 CSR 130.5 (b)(8) The process for developing an inventory and priority ranking of needs for the construction of waste treatment works required to meet the applicable requirements of Sections 301 Effluent Limitations and 302 Water Quality Related Effluent Limits of the Clean Water Act.

This element discusses future needs for water quality protection facilities. The water quality needs of communities are significant. The Missouri Department of Natural Resources maintains an inventory of identified public wastewater works construction needs. A need is a cost estimate for a project eligible for Clean Water State Revolving Fund loans and state grants.

Element 9 - The Process of Determining Priority of Permit Issuance
40 CFR 130.5 (b)(9): the process for determining the priority of permit issuance

This element discusses the permitting process. The department makes decisions regarding construction and operating permit applications within time lines established under Missouri Clean Water Law. First-time operating permits are not issued until an applicant provides proof to the department that a permanent organization exists that will serve as a continuing authority for the facility.

Compliance Monitoring and Enforcement

Clean Water Rules Review

Archived 2001-2005 Continuing Planning Process document - Prepared pursuant to Section 303(e) of the Clean Water Act. Approved by the Missouri Clean Water Commission Nov. 28, 2001.

The Continuing Planning Process is an informational document for public and environmental interests, state and local government and the U.S. Environmental Protection Agency. The document provides discussions of planning activities and processes and access to additional sources of information and references, including technical guidance documents or memorandums of agreement for those interested in water quality management in the Missouri Department of Natural Resources. The goal of the Continuing Planning Process is to document a comprehensive and efficient water quality management process.

What is the Continuing Planning Process?

The CPP describes the Department of Natural Resources' Water Protection Program's water quality programs, processes and planning activities, including the interconnectedness of these activities, by addressing each of the nine minimum federal CPP elements required under the Clean Water Act. The U.S. Environmental Protection Agency - Region 7 may review the CPP from time to time. The program anticipates revisiting the CPP annually.

The Water Protection Program manages regulatory, permitting, engineering, monitoring and assessment and financial assistance programs and, through its enforcement program, takes compliance assistance actions or enforcement actions as necessary. Missouri's Continuing Planning Process revisions for 2014 reflect the ongoing planning processes for water quality and wastewater treatment within the Water Protection Program.

The 2014 CPP will address program processes as required and the opportunities for public participation in its various regulatory programs. Future web updates are anticipated as a result of the department's modernization and streamlining efforts.

The federal Water Pollution Control Act under Section 303 in the federal Clean Water Act of 1977 requires each state to maintain a Continuing Planning Process. Recognizing that program changes in policies and processes occur over time, the Clean Water Act requires that such changes are consistent with the act's requirements. Missouri received approvals from EPA Region 7 for its original CPP in 1973, its revised CPP in 1974 and its 2001-2005 CPP revisions in 2001.

Environmental Laws and Regulations: www.dnr.mo.gov/assistance/laws-regulations.htm
Clean Water Forum: dnr.mo.gov/env/wpp/cwforum/index.html

Element 1 - Strategic Planning for Future Development

Strategic Summary

This element focuses on the Missouri Department of Natural Resources, Water Protection Program, Water Pollution Control Branch (WPCB, the Branch) operating permit functions. Missouri State Operating permits establish technology and water quality requirements necessary to implement the federal Clean Water Act and the Missouri Clean Water Law. The WPCB has effectively maintained a permit backlog of less than 10 percent permits expired since the last CPP cycle. In 2013, the backlog was only 6.5 percent of all permits. For the last several years the Branch has developed many new and innovated policies regarding schedules of compliance and affordability.

In 2013, the Water Protection Program revised three National Pollutant Discharge Elimination System, NPDES, standard condition documents, one of which had not been revised since 1980. In the coming years the Branch will focus permitting efforts to facilitate water pollution permitting

activity on an 8 digit watershed basis. By implementing permit requirements via watersheds it is our hope to create innovated opportunities to improve water quality, not available to us in the past, as permits were not issued on a watershed basis. The Branch will continue to maintain and revise the standard NPDES conditions, as well as other implementation documents.

Additional revisions will continue to be focused on the economics of small communities who must comply with changing water quality requirements. This will likely spark revisions to both the affordability and the schedule of compliance guidance, as well as amendments to the effluent regulations regarding affordability. To facilitate open lines of communication, the process of developing direction utilizing stakeholder input will continue. This will occur via quarterly forum meetings as well as ad hoc forum groups that tackle specific issues. Significant effort will be needed to assist communities with declining populations and aging wastewater treatment facilities. Permitting industrial discharges will also require more effort in the coming years, particularly with regard to coal fired power plant facilities. Efforts to implement new steam electric effluent limit guidelines, via permits for process waste and storm water, will require significant staff resources. The branch will also initiate rule amendments that address stormwater discharges from MS4 permittees as well as industrial facilities.

Element 1 - Overview

Water Pollution Control Program Mission

The mission of the Water Pollution Control Program is to protect Missouri's water quality in its rivers, lakes and streams. The program's permitting process assures the protection of one of nature's most vital resources. The Missouri Clean Water Commission issues permits under state and federal laws limiting the discharge of pollutants in the state's waters. Water quality standards and effluent regulations are used to establish the conditions and limitations contained in permits.

National Pollution Discharge Elimination System (NPDES)

The process for developing effluent limitations and schedules of compliance, required by the Clean Water Act (the Act) including the applicable Water Quality Standards, is referred to as the National Pollutant Discharge Elimination System (NPDES). The National Pollutant Discharge Elimination System (NPDES) controls are used in industrial, municipal, wastewater treatment plants and, in storm water discharges.

Missouri was granted NPDES implementation authority by the U.S. Environmental Protection Agency in 1974. State water pollution control operating permits, issued and enforced by the state of Missouri, are equivalent to NPDES Permits. State permits have requirements and limits on amounts of pollutants that discharged waters may contain. Permits are promulgated and issued by the Missouri Clean Water Commission under Chapter 644, RSMo. The state has the primary authority under the NPDES for permitting, inspection and enforcement activities of regulated facilities within the state.

Point and Non-Point

Water pollution sources are generally classified as either point source or nonpoint source. Water quality can be affected by point sources, such as municipal and industrial discharges and by nonpoint sources, such as urban runoff, agricultural practices and some construction activities. Point source discharges are generally required to operate under the NPDES permit program, while nonpoint source pollution is addressed by the state's nonpoint source planning efforts.

Permits issued by the Missouri Department of Natural Resources require that facilities meet specified limits on pollutants going into a Missouri waterway. The Water Protection Program regulates and issues permits for a variety of industrial, commercial and construction activities.

State Implementation of NPDES

The state's implementation authority for the federal NPDES program requires that state regulations insure that facilities use effective treatment methods to prevent water contamination. There are technology-based limits, water quality-based limits and effluent limits derived from applicable technology and Water Quality Standards (WQS), as well as best management practices for storm water discharges associated with industrial activities that must be accommodated in the NPDES program. Applicable deadlines for meeting effluent requirements are part of the state operating permit. The permitted limits for treated wastewater allow discharges to state waters or no discharge, requiring land application.

The residuals or sludge removed cannot be discharged but must be disposed of according to state regulations. The NPDES program regulations control the industrial, domestic and publicly operated treatment works. The pretreatment program for the publicly operated treatment work is a cooperative effort of federal, state and local regulatory environmental agencies established to protect water quality.

The Missouri Clean Water Commission adopts and/or modifies effluent, pretreatment and control regulations. These regulations insure that facilities use effective treatment methods to prevent water pollution from each significant or potentially significant source. These same regulations limit or prevent the introduction of water contaminants into publicly-owned treatment works throughout the state as required under the Clean Water Act. The Commission may modify such regulations from time to time.

Element 1 - Affordability

Clean water affordability provisions are implemented in the permitting programs as a result of several changes to environmental rules in 2011. Procedures have been developed to ensure consistency in the application of the affordability requirements in the issuance and enforcement of permits. Affordability requirements may be inserted into rules where applicable. The department is required to issue a permit with final effluent limits that are in accordance with current Water Quality Standards per the Clean Water Act, Section 644.051(1) RSMo., and Section 644.051(2) RSMo. In order to mitigate adverse impact to distressed populations resulting from the costs of improvements, the practical use of affordability findings allows longer implementation schedules. The affordability finding document, included with the operating permit or enforcement agreement, does not take the place of Factor 6 in the Use Attainability Analysis (UAA) issued by the U.S. Environmental Protection Agency or, a variance.

The department is required to issue findings of affordability upon which to base NPDES permits and enforcement decisions, to the extent allowable under chapter 644.145.1 and the Federal Control Act, 33U.S.C. /25/ et.seq., concerning any portion of a combined or separate sanitary sewer system or publicly-owned treatment works, when it contains a new environmental requirement or, enforces provisions of the law. The department is not required to make a finding of affordability for sewer extensions, renewals or modifications that contain no new environmental requirements, or if the community is greater than 3,300 people and waives the department's finding requirement.

The department must determine whether a permit or decision is affordable.

There are seven criteria that the department uses to analyze whether a community can immediately afford the upgrades necessary to meet the new permit effluent limits, before making a decision. The seven criteria evaluated in the department's finding, as required by 644.145 RSMo, are:

1. A community's financial capability and ability to raise and secure necessary funding, which includes what the current user rate is, what the community's rate capacity and bond capacity and rating are, current outstanding debt, and any other relevant factors;

2. Affordability of pollution control options for the households of the community, which includes current annual operating costs, current user rates, the estimated annual costs for the upgraded system, estimated resulting user costs per household, median household income, and the cost per household as percent of the median household income;
3. An evaluation of the overall costs and environmental health benefits of the control technologies, which includes a discussion of the environmental benefits of the new requirements, such as ammonia and its toxicity or E. Coli and disinfection for public health;
4. An inclusion of ways to reduce economic impacts on distressed populations in the community, which includes a discussion of the community's unemployment, median household income, change in population, change in median age of the community, percent of households in poverty, percent of households relying on food stamps, and discussion of cost savings or cost avoidance, such as connection to another system, funding available through the department's Financial Assistant Center, conversion to land application system, or a discussion of why a longer schedule of compliance is necessary;
5. An assessment of other community investments relating to environmental improvements, which can include discussion of the community's MS4 commitments, upgrades made to the drinking water system, landfill or power plant improvements, or recycling/conservation programs;
6. An assessment of factors set forth in the USEPA's guidance, which includes the community's bond rating, overall debt as percentage of full market property values, unemployment rate, median household income, property tax revenues as percent of full market property value, and property tax collection rate; and
7. An assessment of any other relevant local community economic conditions, which includes any recent natural disaster, other major upgrades to infrastructure, local economic changes that may not be reflected in the unemployment or poverty rate including an industry leaving or expanding its force.

The affordability of new pollution controls, required under the 2nd criteria, is completed by a spreadsheet developed by the department. The department evaluated five different treatment technologies capable of meeting ammonia less than 1.0 mg/L and that meet losing stream effluent limits for biochemical oxygen demand (BOD) and total suspended solids (TSS). The five treatment technologies evaluated were designed using the preliminary design and costing software *CapDet Works* by Hydromantis. *CapDet Works* uses a unit costing approach with an extensive national costing database that accounts for the effects of inflation. *CapDet Works* allows for the treatment plant to be designed based on wastewater characteristics.

CapDet Works estimates the overall project costs, including capital costs, and operations and maintenance costs. From there the department developed a spreadsheet to calculate present worth costs over a twenty year period, debt retirement per user, and operation and maintenance cost per user, and overall estimated user cost per household on a monthly basis. The operation and maintenance cost includes operational staff costs, material, energy, chemical, and maintenance costs. As *CapDet Works*, the spreadsheet is based on national indices and cost. The affordability analysis is usually higher than the actual cost a community faces for upgrades. *CapDet Works* does not reflect site-specific or individual situations a community faces when upgrading or other items the community needs to address.

The department uses a holistic approach that considers each of the seven criteria, determining the socioeconomic burden the new cost will attribute to the community. Prescriptive formulas, such as median household income, cannot be considered as the only indicator of the community's financial capability to upgrade the existing wastewater treatment facility.

Under 644.145.3 the department must adopt procedures to determine whether a permit or decision is immediately affordable. The department reviews community investments in environmental improvements by assessment of factors set forth in EPA guidance, identified in the "CSO Guidance

for Financial Capability Assessment and Schedule Development." The determination is based upon the reasonably available empirical data of a community's financial capability, the affordability of pollution control options for individual households, an evaluation of costs and environmental benefits of the control technologies, through the inclusion of ways to reduce economic impacts on distressed populations in the community and, an assessment of other community investments relating to environmental improvements. It includes, but is not limited to, low and/or fixed income populations.

The permit writer reviews the information supplied by the permit applicants and/or the reasonably available empirical data found. Preliminary affordability determinations are released to the applicant, prior to public notice. After public notice and comment, the WPP will issue its final affordability finding together with the final permit. Renewals and other discretionary actions without substantive modifications will generally be assumed as affordable. The applicant may contest a finding.

Affordability findings are prepared where there is a settlement or unilateral order. Enforcement actions resolved by consent will reflect the affordability requirement and include affirmation that the resolution is affordable.

Enforcement

When enforcing the provisions of the Missouri Clean Water Law and the Federal Water Pollution Control Act the WPP prepares and affordability finding pursuant to Section 644.145. The affordability findings are prepared for publicly-owned, combined or separate sanitary or storm sewer system or treatment works.

In the process of negotiating a schedule to correct the violations the WPP sends the responsible party a draft Abatement Order on Consent (AOC) and a draft Finding of Affordability. The responsible party then has an opportunity to comment or suggest changes to the AOC and the Finding of Affordability. Once an agreement on AOC and the Finding of Affordability is reached the responsible party and the department signs the AOC and, the Finding of Affordability is incorporated into the AOC as an exhibit.

Element 1 - ePermitting

The ePermitting online tool, in full effect Sept.1, 2011, with some exceptions, will greatly reduce the wait time between submission of an application and issuance of the corresponding permit, allowing Department permit writers to focus on more complex site-specific permits. This will potentially reduce processing time for site-specific permits, promote the goals of the department and, allow for compliance with applicable permitting requirements. Land disturbance permits make up approximately 44 percent of all clean water permits.

Individuals may now go online, fill out their application, locate their project using a newly developed GIS program, submit payment, and receive their General Missouri State Operating Permit on the same day. To ensure the success of the ePermitting project, the department is using a phased approach. Later phases will incorporate modifications, renewals, and terminations for all General Missouri State Operating Permits. Additionally, the ePermitting system will be developed to offer this level of online services for Sewer Extension Construction Permits and Permits-by-Rule.

To apply on-line for the Land Disturbance Permits, now available through ePermitting, the application will need the following:

- Computer and high speed internet in order to use the GIS portion of the process
- A debit or credit card or checking account
- A Stormwater Pollution Prevention Plan (SWPPP) must be developed prior to permit issuance from ePermitting
- A map of the project area that includes the entire contiguous area where land disturbance is to occur

- Knowledge of the land disturbance activity to occur in a location that falls under the U.S. Army Corps of Engineer's jurisdictional waters

A permittee may go to the Department of Natural Resources Web page at dnr.mo.gov and click on the ePermitting emblem. Access to a tutorial, the user manual and, the link to begin application is provided.

With the implementation of ePermitting, it is anticipated that the majority of permits issued by the department will be automated. With further implementations in future phases of ePermitting and related projects, Missouri's permit universe that permit writers draft individually will be reduced from approximately 16,000 to fewer than 2,000.

Element 1 - Effluent Limits Determination

Determining effluent limits in state operating or National Pollutant Discharge Elimination System (NPDES) permits is an important component in the implementation of water pollution control in the State of Missouri. All permit limits or conditions are developed to protect Missouri Water Quality Standards. While wastewater, concentrated animal feed operations (CAFOs), or stormwater permits are developed to be protective of water quality standards, they may vary widely in specific limits, best management practices, or conditions based on the nature of the discharge and the type of receiving waters.

Permitting for Municipal and Domestic Treatment Systems

According to the Clean Water Act, wastewater permits must reflect the more stringent of either the technology-based and water quality-based limitations for all pollutant of concern (POC). This decision making process for deriving effluent limits for pollutant of concern is documented in the program's fact sheet. Permits may contain numerical effluent limits, special conditions, and those requirements the department determines are necessary to protect water quality. These conditions or requirements may be a Storm water Pollution Prevention Plan (SWPPP), a sludge management plan, best management practices, or POC effluent sampling and monitoring frequency.

The department issues permits for the discharge of wastewater from different types of sources. Municipal sources are often referred to as Publicly-Owned Wastewater Treatment Works (POTW). Wastewater that is produced by homes and businesses in these municipalities are conveyed to the treatment works using public sewers, and the collection and treatment of this wastewater is regulated through permits issued to the POTW. Private wastewater treatment systems are also permitted by the department, and these systems typically treat domestic waste from homes that are not part of public municipal systems.

Industrial Activity Permits

Missouri industrial activities may need a general stormwater permit or, a site-specific permit for discharges to waters of the United States or, to an MS4. If the activity does not discharge to either, no permit is needed. If it does discharge to one or both and if the industrial activity is listed among the categories and meet certain requirements as outlined in 10 CSR 20-6.200 (2), a permit is required.

An industrial activity may be excluded from a stormwater permit if the activity does not expose materials to storm water as stated in 10 CSR 200 (1)16. Qualified industries seeking exemption must submit a completed No Exposure Exclusion Certification form (USEPA form 3510-11) to the Missouri Department of Natural Resources each permit cycle. This form is available at the following link: www.epa.gov/npdes/pubs/msgp2008_appendixk.pdf.

The Water Protection Program's Water Pollution Control Branch recognizes the need for a consistent strategy and rationale in the development of effluent limitations and monitoring

requirements for discharges to waters of the state. Technology based or, water quality based limits, most protective of water quality and, preventing the degradation of the water, are used. Technology-Based Effluent Limits and Water Quality Based Limits

When developing effluent limitations, a water quality reviewer (the permit writer) must consider limits based on both the technology based effluent limits to control the pollutants and water quality based effluent limits, protective of the water quality standards of the receiving water. According to the Clean Water Act, permits must reflect the more stringent of either the technology-based or water quality-based limits for all pollutants of concern. The effluent limit determination and derivation process considers current effluent requirements, background water quality, nearby discharges and antidegradation requirements supported by best professional judgment. Technology based limits represent a level of treatment that can be typically achieved through the use of common control technologies. The program's rules define the technology-based treatment requirements for various discharges.

Final permits may contain numerical effluent limits, special conditions and, those requirements that the Water Protection Program determines are necessary to protect water quality. These conditions or requirements again, may be a Stormwater Pollution Prevention Plan (SWPP), a sludge management plan, best management practices or, pollutant of concern (POC) effluent sampling and monitoring frequency.

Waterbodies are assessed over time to determine if water quality standards are being maintained. These assessments are published in the 305(b) report and the 303(d) list of impaired water bodies.

Missouri Revised Statutes, Chapter 644, water pollution control and, the Whitsundays for Water Quality and Antidegradation Review Assistance: A Technical Reference Guide (link below includes effluent limits guidance discussion), protect water quality, human health and the environment. The procedures for developing many water quality based effluent limits in the guidance are derived from EPA's guidance document, Technical Support Document for Water Quality-Based Toxics Control.

Permit Writer determines permitting conditions, effluent limits and requirements in accordance with the Missouri Clean Water Law and its implementing regulations, and guidance documents such as: The department's Water Pollution Control Permit Writer's Manual

Guidance that supplements the Missouri Antidegradation and Implementation Procedure, May 2012: Guidance for Water Quality and Antidegradation Review Assistance: A Technical Reference Guide

EPA guidance document: Technical Support Document For Water Quality-based Toxicodendron (EPA/505/2-90-001)

Missouri Revised Statutes Chapter 644

Permitting for Concentrated Animal Feeding Operations (CAFOs)

CAFOs must have a nutrient management plan incorporated into the no-discharge permit. The department's guide to Animal Feeding Operations provides an overview of Missouri's CAFO regulatory program and the department's public appeals process. Additional information can be found by visiting the department's CAFO Web page at:

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

Permitting for Storm water Discharges

Polluted stormwater runoff is a leading cause of impairment to the nearly 40 percent of surveyed United States water bodies which do not meet water quality standards. Over land or by storm sewer systems, polluted runoff is discharged, often untreated, directly into local water bodies. When left uncontrolled, this water pollution can result in the destruction of fish, wildlife, and aquatic life

habitats; a loss in aesthetic value; and threats to public health due to contaminated food, drinking water supplies, and recreational waterways.

In 1987 the federal Clean Water Act was amended to include the regulation of certain stormwater classes which lead to the establishment of the National Pollutant Discharge Elimination System (NPDES) permitting program. The NPDES program requires the implementation of controls designed to prevent harmful pollutants from being washed as stormwater runoff into local water bodies.

Regulated entities must obtain coverage under an NPDES stormwater permit and implement stormwater pollution prevention plans (SWPPPs) or stormwater management programs (both using best management practices (BMPs) that effectively reduce or prevent the discharge of pollutants into receiving waters.

Guidance for Best Management Practices for storm water control is in the Protecting Water Quality field guide, see below.

General Permits

General permits cover a group of similar discharges under one permit. These permits simplify the process for dischargers to obtain authorization to discharge, provide permit requirements for any discharger that applies for coverage, and reduce the administrative workload for NPDES permitting authorities. General permits for stormwater management require owners or operators of certain facilities or those with land disturbance projects to manage their practices in ways that are beneficial to the environment and to Missouri streams. These permits generally specify that stormwater discharges shall not cause water quality violations.

Site-Specific Permits

Many facilities have business practices that cannot be covered under a general permit and so are required to obtain a site-specific permit. A site-specific permit may be for a business that stores toxic materials or large amounts of potential contaminants on site that are exposed to rainfall. These permits require additional attention from the permit writer in determining how existing practices effects the environment and what requirements will be needed to ensure the environment and Missouri streams are not adversely impacted.

Stormwater Permits

The law requires that stormwater permits be issued in three broad categories:1) Land Disturbance Permits for land disturbance activities of 1 acre or greater, or less than 1 acre but part of a larger common plan of development or sale, 2) Municipal Separate Storm Sewer System (MS4) permits for municipalities of 100,000 or more in population as well as other criteria that could designate a municipality into the program, and 3) Industrial Stormwater Permits for industries with certain Standard Industrial Classification (SIC) codes that are required to obtain permits for their process water and stormwater discharges. All regulated facilities and/or projects are required to obtain the required permit, a general permit or a site-specific permit, prior to beginning the regulated activity.

Land Disturbance Permit

The primary pollutants of concern from construction activities are silt and sediment, but other pollutants such as oils and grease, vehicle fluids, and debris are present as well. The removal of vegetation exposes bare soil which is much more vulnerable to erosion, resulting in sediment moving into receiving waters. Construction activities increase pollutant loads and runoff. Sedimentation can destroy aquatic habitat and high volumes of runoff can cause stream bank erosion. The volume and rate of runoff are typically increased, providing a larger capacity to transport pollutants to rivers and lakes.

State law requires land disturbance activities of one acre or greater, and those less than one acre if part of a common plan of development or sale to be covered under a permit prior to the onset of construction activities.

The primary requirement of the land disturbance permit is development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The purpose of the SWPPP is to ensure the design, implementation, management and maintenance of BMPs in order to reduce the amount of sediment and other pollutants in stormwater discharges.

The plan must be kept on-site. Plans do not need to be sent to the Missouri Department of Natural Resources unless specifically requested. The plan must be amended when changes in facility design, construction, operation or maintenance occur.

The permittee shall select, install, use, operate, and maintain appropriate BMPs for the permitted site. The following manuals are acceptable resources for the selection of appropriate BMPs. The permittee is not limited to the use of these guidance manuals; however, all BMPs should be described and justified in the SWPPP.

Stormwater Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices, (Document number EPA 833-R-06-004) published by the United States Environmental Protection Agency (USEPA) in May 2007 as well as other information, including examples of construction SWPPPs, is available at the USEPA internet site below.

Protecting Water Quality: A field guide to erosion, sediment and stormwater best management practices for development sites in Missouri, published by the Missouri Department of Natural Resources, is available on the department's internet site below.

MS4 Permits

A Municipal Separate Storm Sewer System (MS4) is a conveyance or system of conveyances, including, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains, designed or used for collecting or conveying stormwater which is not a combined sewer and is not part of a Publicly Owned Treatment Works (POTW). MS4s are owned or operated by a state, city, town, borough, county, parish, district, association, or other public body including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity. Storm water discharges to combined sewer systems are exempt per 10 CSR 20-6.200(1)(C) 16. MS4s subject to Phase I and Phase II regulations must seek permit coverage by the department. Here is the MS4 website: dnr.mo.gov/env/wpp/stormwater/sw-local-gov-programs.htm

Communities regulated as a Phase II MS4 must build, implement and maintain a program through a written Stormwater Management Plan addressing six minimum control measures; 1) public outreach; 2) public involvement and participation; 3) illicit discharge detection and elimination; 4) construction site runoff management; 5) post construction runoff management; and 6) pollution prevention and good housekeeping in municipal operations. The MS4 must complete annual report forms and submit them to the department.

Kansas City, Independence and Springfield are considered medium to large MS4s. These MS4s were issued site specific permits under the Phase I regulations based on their populations greater than 100,000. Phase I communities must implement a documented stormwater program plan that address the Phase II items as well as provide jurisdiction-wide stormwater quality assessments and an industrial runoff management program as stated in 10 CSR 20-6.200 (4). The regulated MS4 must complete annual report forms and submit them to the department.

Web Links

The department's "Permit Assistant" is an online program web application which is useful in determining what type of environmental permit may be needed as well as the required form/s to

apply for the permit. This program is available on the department's internet site at: <http://www.dnr.mo.gov/mopermitassistant/>.

State of Missouri Stormwater Regulations, Division 20, Chapter 6, Permits, 10 CSR 20-6.200, may be located on the following internet site: <http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf>.

USEPA Stormwater Regulations can be found at: http://cfpub.epa.gov/npdes/regs.cfm?program_id=6. Stormwater basic information is available at the USEPA internet site at: <http://cfpub.epa.gov/npdes/stormwater/swbasicinfo.cfm>.

Stormwater Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices, (Document number EPA 833-R-06-004) published by the United States Environmental Protection Agency (USEPA) in May 2007. This manual is available at the USEPA internet site at: <http://cfpub1.epa.gov/npdes/stormwater/swppp.cfm>.

Protecting Water Quality: A field guide to erosion, sediment and stormwater best management practices for development sites in Missouri and Kansas, published by the Missouri Department of Natural Resources. This manual is available on the department's internet site at: <http://www.dnr.mo.gov/env/wpp/wpcp-guide.htm>.

MS4 Phase II Stormwater program overview of the requirements can be found on the USEPA's Web page at: <http://www.epa.gov/npdes/pubs/fact2-0.pdf>. Additional information on the Stormwater Management Plan and the Annual Report Form may be found on the Missouri Department of Natural Resources' Web page at: <http://www.dnr.mo.gov/env/wpp/stormwater/sw-local-gov-programs.htm>

Missouri Guide to Green Infrastructure: Integrating Water Quality into Municipal Stormwater Management: : <http://dnr.mo.gov/env/wpp/stormwater/mo-gi-guide.htm>.

Industrial Stormwater Permitting information may be found at the following Missouri Department of Natural Resources' website : <http://www.dnr.mo.gov/env/wpp/stormwater/sw-industrial-permits.htm>, and at the USEPA's internet site at: <http://cfpub.epa.gov/npdes/stormwater/indust.cfm>.

Element 1 - Public Notices and Participation

The department issues both Site Specific and General Permits. The applicant is given 15 working days to preview the permit for non-substantive drafting errors prior to the permit being placed on formal public notice. Their permit is then placed on public notice for a period of 30 days. The permittee as well as the general public may comment on the draft permit during this 30 day period. After the public notice period the department considers all comments received and makes the appropriate changes to the permit. Once this final step has been completed the department proceeds with the issuance of the permit.

Permits the department has placed on Public Notice as well as instructions for commenting on permits during Public Notice are available at dnr.mo.gov/env/wpp/permits/permit-pn.htm.

Element 1 - Schedules of Compliance

Permits may contain schedules of compliance allowing the permittee to take certain steps to achieve compliance with applicable standards: 10 CSR 20-7.015(9)(C).

SOC may exceed permit term. Permits may contain schedules of compliance requiring the permittee to take certain steps to achieve compliance with applicable standards [644.051.4 RSMo, 10 CSR 20-6.010 (7), 10 CSR 20-7.031(11)]. If it will take longer than a year to achieve compliance, Federal

Regulations require an annual benchmark report chronicling the progress made during each year of the compliance period [40 CFR 122.47 (a) (3)]. It is common for a schedule of compliance to exceed the life of the permit, particularly for permits issued for less than five years, 40 CFR 122.47(a)(3).

Element 1 - State Pretreatment Responsibilities

Pretreatment is the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater before or in lieu of discharging such pollutants into a Publically Owned Treatment Works (POTW).

The CWA Section 307 established a program to address indirect discharges for industries that discharge to a POTW. The pretreatment component of the NPDES permit is part of the National Pretreatment Program.

The program is a cooperative effort of the federal, state and local regulatory environmental agencies established to protect water quality. There are currently about 45 approved and active pretreatment programs in the state. Through an agreement with the U.S. Environmental Protection Agency (EPA) in the early 1980s, the Missouri Department of Natural Resources became the approval authority for delegating control authority to cities and their POTWs. Missouri state law authorizes control authorities (cities/POTWs) to issue and enforce pretreatment permits. Missouri's General Pretreatment Regulation, 10 CSR 20-6.100 effective October 30, 2010², has incorporated the federal general pretreatment regulation 40 CFR 403 and those federal categorical standards in 40 CFR 405-471 that have pretreatment requirements.

Since the mid-1980s, Missouri requires cities to have a state-approved pretreatment program when certain industries are connected to the POTW. The pretreatment program requires industries to meet numeric limits on pollutants and today's pretreatment program is required to employ best management practices to control pollutants that are discharged into city sewers.

General pretreatment regulations require all POTWs with design flows greater than 5 million gallons per day and receiving industrial discharges that are subject to federal limitations or that pass through or interfere with the operation of the POTW to develop and implement an approved pretreatment program. At the discretion of the department, smaller POTWs can also be required to develop programs. The State of Missouri as approval authority will review and approve a cities pretreatment program submission. The state will put a pretreatment program (or a substantial modification) on public notice before approval. A substantial modification is a modification that generally has less stringent requirements for the regulated industries. The public notice of intent to approve a pretreatment program or substantial modification is posted at the web site:

<http://dnr.mo.gov/env/wpp/pretreatment.htm>

In cities with an approved pretreatment program, the POTW is the regulating authority for all Industrial Users contributing wastewater to POTW's. Local authorities incorporate pollutant limits and best management practices within their Industrial User permit process. These same authorities are responsible for the staffing and funding of their pretreatment programs.

An Industrial User permit describes, at a minimum, the duration of the permit, a statement of conditions for transferability, the effluent limits, monitoring and reporting requirements, and a statement of applicable civil and criminal penalties and any compliance schedule.

The requirements of an Industrial User permit reflect the most stringent of the applicable federal, state and local pretreatment standards. Federal pretreatment standards for certain types or categories of industries are in the federal regulations at 40 CFR parts 405 through 471. State of Missouri pretreatment standards are the general and specific prohibitions in the state's *General Pretreatment Regulation*.

Local control authorities (cities/POTWs) are required to develop local limits, or demonstrate that local limits are not necessary. These local limits are calculated as part of the initial pretreatment program submission and are reviewed when conditions change, or at least once in a NPDES permit period.

Approximately 30 Industrial Users in Missouri are located in cities that do not have approved pretreatment programs. The State of Missouri is the control authority for those Industrial Users in cities that do not have an approved pretreatment program. In accordance with Missouri Revised Statutes subsection 644.026(13), the State of Missouri cannot issue an Industrial User permit. For Industrial Users subject to the categorical standards in 40 CFR 405-471, the state will ask for compliance (in writing) with federal and state pretreatment standards, monitor the industries, and report compliance to EPA Region 7. Where an Industrial User is not adequately controlled to protect the POTW, the State of Missouri will require that the city/POTW develop a pretreatment program as a NPDES permit condition.

State Pretreatment Responsibilities

Through a formal agreement with EPA Region 7, the state administers the National Pretreatment Program in Missouri. The duties associated with program administration include the following:

- On-site reviews of local POTW programs, which may consist of Pretreatment Compliance Inspections or Pretreatment Audits
- Reviewing annual pretreatment reports submitted by local POTW programs
- Reviewing and approving new local POTW programs and modifications to existing programs
- Acting as control authority for categorical Industrial Users discharging to POTWs without a local pretreatment program
- Reviewing all new or modified NPDES permits issued to POTWs to ensure that the appropriate pretreatment requirements are included
- Maintaining a list of pretreatment cities
- Providing technical assistance and general information to POTWs, industries, consultants and the general public

References

- *General Pretreatment Regulations for Existing and New Sources of Pollution*, Code of Federal Regulations, 40 CFR Part 403, www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR
- *Missouri Clean Water Law*, Missouri Revised Statutes, Chapter 644 RSMo, www.moga.mo.gov/mostatutes/ChaptersIndex/chaptIndex644.html
- *General Pretreatment Regulations*, Missouri's Code of State Regulations, 10 CSR 20- 6.100, www.sos.mo.gov/adrules/csr/current/10csr/10c20-6.pdf
- *Introduction to the National Pretreatment Program*, June 2011, EPA 833-B-11-001, www.epa.gov/npdes/pubs/pretreatment_program_intro_2011.pdf
- *Local Limits Development Guidance*, July 2004, EPA 833-R-04-002A; and *Local Limits Development Guidance Appendices*, July 2004, EPA 833-R-04-002B, www.epa.gov/npdes/pubs/pretreatment_local_limits.pdf and www.epa.gov/npdes/pubs/final_local_limits_appendices.pdf
- *Guidance Manual for POTW Pretreatment Program Development*, October 1983, EPA, www.epa.gov/npdes/pubs/owm0003.pdf
- *Industrial User Permitting Guidance Manual*, September 2012, EPA 833-R-12-001A, www.epa.gov/npdes/pubs/pretreatment_iu_permitmanual.pdf

Element 2 - Strategic Planning for Future Development

Strategic Summary

Incorporating Waste Treatment Plans and Basin Plans Projects and Loans and Grants to encourage communities to build the most appropriate wastewater treatment systems The department is building on the area wide wastewater treatment and basin planning of the past under 208/209 planning to a watershed based planning, integrated in the Department's Our Missouri Waters Initiative.

Watershed-based management effort will include permitting, effluent trading, water quality and biological monitoring and assessment, inspections, 319 and State Revolving Funding as well as Water Resources and Soil and Water Conservation projects.

The watershed approach allows the Department to comprehensively address watershed-specific issues in the sixty-six (66) watersheds using all of the tools the department can offer, whether the resources are located in Water Protection Program, Water Resources Program, or in the Soil and Water Conservation Program. This allows solutions to be tailored to specific needs rather than a 'one size fits all' approach. This approach allows for measurable results so continued improvements can be made in water protection activities. The end result should be a systematic approach to evaluating each watershed and applying solutions, including permitting of point sources within the watershed.

The Department began work with the Our Missouri Waters in three pilot watersheds in 2013. For 2014, the Department expanded the Our Missouri Waters program into an additional six watersheds, to bring the outreach efforts to nine (9) major watersheds in the state. The state's delegated funding authority under the Clean Water State Revolving Fund for project loans and grants for area-wide waste treatment includes funding set aside for work in the pilot watersheds and provides money for smaller communities for engineering grants, which is intended to encourage districts and communities to plan for the future, design and build wastewater treatment collection systems to serve their communities.

Throughout the different types of planning and into the future, public participation is a large required component of the planning and implementation. The program continues to receive input from stakeholders on what the State's priorities are and how planning should occur.

Element 2 - Area-wide Waste Treatment and Basin Planning

Section 208 Planning Authority for Area Wide Waste Treatment and the Identification of Wastewater Treatment Collection Systems for Permitted Facilities under Section 209 Basin Planning

The Water Pollution Control Program conducts and coordinates various planning activities and programs initially prescribed by the Clean Water Act under Sections 208 and 209. Under Section 208 planning authority states have designated area-wide waste treatment management planning agencies and have developed plans under Section 209 that include the identification and construction of treatment works needed to meet municipal and industrial needs for a design period of at least 20 years.

The original continuing planning process under Section 208 is largely replaced by the Clean Water Act Section 201 facility planning effort. The programs basin planning effort under Section 209 identifies all wastewater treatment collection systems for permitted facilities in metropolitan and outlying areas and the affected stream reaches in each basin.

Under Section 209 basin planning the Department is working towards a watershed based permitting process, within the 66 different watersheds. The watershed approach will allow the program to comprehensively address watershed-specific issues. Solutions will be tailored to specific needs rather than a 'one size fits all' approach.

Revisions to the Construction and Operating Permits rule, 10 CSR 20-6.010, will help answer long standing questions on what is available how a community becomes a regional sewer provider, and

other initiatives such as long term infrastructure and water pollution controls, on a watershed basis. Other challenges with planning that the Department is addressing are the rule's authorities for Level 1 designated areas. As wastewater effluent regulations continue to become more protective, cost for providing wastewater treatment increases the focus on watershed based permitting and decision making. More communities are interested in Level 2 authority where there is a need for the development of a regional plan to address wastewater, infrastructure, and water needs.

Public participation is a vital and required component in future planning and implementation. The program needs continued input from stakeholders on what the State's priorities are and how planning should occur.

Section 208: Area-wide Waste Treatment Planning

Under section 208, states were required to designate area-wide waste treatment management planning agencies and develop plans that include the identification and construction of treatment works needed to meet municipal and industrial needs for a design period of at least 20 years. These plans recognized that the watershed and sub-watershed are the primary planning geography for managing wastewater and storm water flows.

In 1974, three areas in Missouri were designated under the Section 208 federal code. The areas were designated to allow the communities and surrounding areas to address the water quality and permitting issues facing their area. Kansas City (Mid-America Regional Council), St. Louis (East-West Gateway Coordinating Council), and the Joplin area (and Ozark Gateway Council of Governments) were designated. Kansas City and St. Louis were designated due to being large metropolitan areas and the influence of large rivers on the cities (the Kansas, Missouri and Mississippi Rivers). Joplin was designated due to its issues and impacts of historic mining operations and being a regional hub for the four state area. Missouri's Water Quality Planning was completed and certified as required.

In many ways, the ideas behind the 208 area-wide management plan are still being used. Besides being used for water permitting, the plans include transportation planning, hazard mitigation, homeland security issues, and economic development. However, rather than being limited to the three areas identified by EPA, basin planning for the entire state was adapted. The 208 funding decreased, along with the idea that there were other basins in the state in need of protection, leading the state and federal funding to Section 209 basin planning type activities.

Section 209: Basin Planning

Under the Clean Water Act section 209 basin planning effort Missouri has in the past and attempts today to identify all private and industrial wastewater treatment collection facilities in metropolitan areas recommending their incorporation into public systems. Public systems are therefore known as section 201 facility planning areas for municipal dischargers. Non-municipal dischargers are also identified in basin plans. All dischargers were originally compiled into basin plans together with the specific effluent(s) discharged and the severity of the pollution problem(s) existing at that time.

The Water Quality Management Plans were completed in 1979, providing a basis for the state water pollution control program operations and decisions. Section 201 delineations, treatment plant regionalization orders, construction grant awards and permit limits were based on the basin planning efforts (Missouri Water Quality Management Plan, 1979). In the past basin planning focused on Missouri's significant discharges and affected stream reaches, determined from the 303(d) or 305(b) lists. While significant discharges can and do affect the stream, the large number of small communities with part time operators and limited resources have the greater potential to affect human health and the environment.

Planning Now and in the Future

In many ways, the state and communities operate under a hybrid of the 208/209 plans in identifying sources of pollution and eliminating point sources affecting the stream. Overall planning must be

budgeted for and supported over the next 20 years of growth. The total maximum daily load program operates through basin plans to help streams recover from pollution. By assigning wasteload allocations and identifying point and non-point sources contributing to the stream impairment, implementation planning allows the stream to achieve its designated uses.

In addition to Total Maximum Daily Load implementation, some communities, especially communities around the Lake of the Ozarks and Table Rock Lake, have established citizen groups to help the communities plan for future growth, eliminating water quality issues by monitoring programs designed to eliminate failing on-site systems. Communities have worked and are working with the department through stakeholder meetings and, through grant funding, to help achieve their goals.

The program continues to promote regionalization for proposed new developments and for existing facilities facing the need to upgrade or expand. Regionalization helps with basin planning by reducing the number of point sources. By connecting to existing facilities, the resultant economies of scale make upgrades and expansions more affordable for communities. With regard to funding, public entities can take advantage of public funding and financing for regional wastewater treatment facilities. The state's delegated funding authority under the Clean Water State Revolving Fund for project loans and grants for area-wide waste treatment is intended to encourage districts and communities to design and build needed wastewater treatment and collection systems.

As water quality criteria continues to tighten effluent limits, more streams are classified with existing uses, and the economic impact of decisions has the department moving to a watershed based permitting approach. By permitting and monitoring by watershed, it will allow the department and the public to address issues for the whole watershed, including point and non-point sources. The watershed data will be used to provide more technically sound permits, supporting human health and the environment.

Watershed Based Permitting

Watershed-based permitting would be part of a larger watershed-based management effort that will include permitting, effluent trading, water quality and biological monitoring and assessment, including inspections, Section 319, State Revolving Funds, and water resources and soil and water conservation projects as well. This planning is integrated with the department's Our Missouri Waters Initiative. The goals are to comprehensively address watershed-specific issues using all of the tools the department can offer. This means that solutions need to be tailored to specific needs rather than a 'one size fits all' approach.

The goal is to address watershed-specific issues with targeted solutions, tailoring activities within a watershed to the specific needs of that watershed. This approach provides measurable results so continued improvements can be made in water protection activities. The end result should be a systematic approach to evaluating each watershed and applying the most appropriate solutions, including permitting of point sources within the watershed. Watershed-based management effectively puts all site-specific permits into a rotating basin schedule where all permits within the watershed are issued during the same year. This allows the department to establish predictable timelines for new permits, allows focus on water quality monitoring efforts, and plan the best approach to resolving issues within each watershed.

The first step in comprehensive watershed-based management is to develop a schedule that will systematically address each of the 66 HUC 8 watersheds in Missouri.

All 66 watersheds will be divided into five groups, each consisting of twelve to thirteen watersheds. The grouping of the watersheds is to ensure that each regional office will be involved with two or three watersheds per year, as the transition to watershed based management includes significant data collection with inspections and sampling.

Public participation is a large component of the planning required. The program can embark on studies and publish reports, but without the public's input and help, achieving healthy, safe streams will not occur.

Continuing Authority

Along with the move to a watershed based permitting and evaluation process, the Department is updating the continuing authority sections of 10 CSR 20-6.010. The current rule includes five levels of authority, which are described briefly below. Continuing Authority is a complex requirement for permittees and the department, but a requirement exists in all operating permits that facilities are required to connect to higher authority within ninety days of notice of availability.

1. Level 1 Authority is areas designated to allow the communities and surrounding areas to address the water quality and permitting issues facing their area. Kansas City (Mid-America Regional Council), St. Louis (East-West Gateway Coordinating Council), and the Joplin area (and Ozark Gateway Council of Governments) were designated in the mid-1970s.
2. Level 2 Authority is a voluntary program for municipalities, public sewer districts, and PSC regulated sewer districts that the Missouri Clean Water Commission approves. A sewer district or municipality must develop a capital improvements plan, develop ordinances requiring connection, develop plans and processes for dealing with environmental concerns within their jurisdiction; and hold a public hearing, before advancing towards the Department and/or Commission. For communities desiring Level Two Authority, there are significant resources required to develop the plans and documentation to present to the Clean Water Commission and the implementation of the plan. Currently, Boone County Regional Sewer District is the only Level 2 Authority; however Northeast Public Sewer District is working on their plan to approach the Commission for approval.
3. Level 3 Authority is a municipality, public sewer district, or sewer company regulated by the PSC other than the ones identified as Level 1 or Level 2.
4. Level 4 Authority is any person, persons, or group of persons contractually obligated to collectively act as a wastewater collection and treatment service, or nonprofit company organized
5. Level 5 Authority is an association of property owners served by the wastewater treatment facility, such as homeowners associations.

The updates to the continuing authority regulations include a way to determine availability. In operating permits currently, one condition requires connection to a higher continuing authority within ninety (90) days of availability. The revisions to the rule discuss what is available. The options include a waiver from the higher authority; a written statement or a demonstration of non-response from the higher authority declining the offer to accept management of the additional wastewater; a diagram that clearly illustrates that the collection system operated by a higher preference authority is beyond two thousand feet (2000') from the proposed facility; a proposed connection or adoption charge by the higher authority that would equal or exceed one hundred twenty percent (120%) of the applicant's cost of constructing or operating the proposed wastewater system; a proposed service fee on the users of the system by the higher authority that is above what is affordable for existing homeowners in that area; terms for connection or adoption by the higher authority that would require more than two (2) years to achieve full sewer service; or terms for connection or adoption by the higher authority are not viable or feasible to homeowners in the area.

A change to the rule allows for municipalities, sewer districts, or sewer companies regulated by the Public Service Commission to apply for Level Two Authority. Level Two Authority is a voluntary program that the Missouri Clean Water Commission approves. The amendment to this rule provides the procedure for approaching the Commission based on how the process has worked with previous communities and lessons learned. A sewer district or municipality must develop a capital improvements plan, develop ordinances requiring connection, develop plans and processes for

dealing with environmental concerns within their jurisdiction; and hold a public hearing, before approaching the Department and Commission. For communities desiring Level Two Authority, there are significant resources required to develop the plans and documentation to present to the Clean Water Commission and the implementation of the plan. As communities continue working to strategic planning and holistic approach to addressing water, wastewater, and stormwater concerns, there may be more communities interested in pursuing Level Two Authority.

The long term significance of the ongoing rule revision may be that as the Department continues working on Watershed based permitting and addressing long term integrated planning for communities, the definition of availability and the process for obtaining Level Two Authority may have a substantial role in those plans. The Department sees the revisions to 10 CSR 20-6.010 to answer long standing questions on what is available, how can a community become a regional sewer provider, and along with the other initiatives the Department is working on in planning for the long term infrastructure, water pollution, and water needs on a watershed basis.

Other challenges to be addressed are working with the Level 1 Authorities, for example to continue addressing concerns in those designated areas. As wastewater effluent regulations continue to become more protective, cost for providing wastewater treatment increases, with increased emphasis on watershed based permitting and decision making. In time the Department sees more communities interested in Level 2 Authority and/or the development of a regional plan to address wastewater, infrastructure, and water needs.

References

- Clean Water Act 1977 (as amended 1992), Section 303(d) (4) Water Quality Standards & Implementation Plans, Continuing Planning Process, (B) “the incorporation of all elements of any applicable area wide waste treatment management plans under Section 208 and applicable basin plans under Section 209.”
- Missouri Clean Water Law, Section 644.116 Rules and Regulations of CWC for Wastewater Projects Missouri Clean Water Law
- Missouri Clean Water Law, Section 644.141 1.A Planning Authority and 1.B Management Authority, 1.C Interstate Agencies, 1.D Termination of Authority. Continuous basin planning updates provide information for the Water Quality Reports to Congress under Section 305(b) biannual reporting requirements
- Department of Natural Resources rules, Division 20, Clean Water Commission: Chapter 6, Permits, Construction and Operating Permits, 10 CSR 20-6.010 and No-Discharge Permits 6.015, and Fees 10 CSR 20-6.011; Chapter 4 Grants; Chapter 7 Water Quality Standards; Chapter 8 Design Guides; Chapter 9 Treatment Plant Operations
- Department of Natural Resources website
- Draft WP Modernization and Streamlining Conceptual Plan

Element 3 - Strategic Planning for Future Development

Strategic Summary

Concurrent with Missouri’s efforts to enhance TMDL implementation, a post-consent decree coordinated effort has emerged at the national level among state and federal program managers in order to move the Clean Water Act 303(d) program – including the TMDL program – in a more strategic direction. Missouri has been an active participant in these discussions, offering both support and critical feedback, as well as helping to develop new measures to gauge TMDL progress. What has emerged from this partnership is an adjusted national programmatic framework that encourages states to focus less on simply producing TMDLs to satisfy an arbitrary number, and more on targeting TMDL development and implementation to effectively achieve actual water quality improvement.

Among the principles expressed in the framework are several that are closely aligned with the department's *Our Missouri Waters* initiative, and that, in turn, could help guide implementation efforts of the Department's TMDL program in the coming years. These principles include a focus on improved prioritization of water quality efforts, better integration of these efforts with the goals and actions of other local, state and federal programs, and more effective engagement of the public and other stakeholders to improve and protect water quality.

One example where all of these principles coalesce is the Spring River. As a result of close coordination with key stakeholders, the Spring River watershed was selected as one of the original *Our Missouri Waters* watersheds. With the understanding that water is a common resource in which everyone has an interest, the Department is actively bringing together and working closely with local citizens, communities and government agencies in the watershed to help protect and restore water quality.

Because of the stakeholder-driven focus as a priority watershed, the department has also prioritized development of TMDLs and TMDL implementation plans to address impaired waters. As a result, TMDLs currently under development target the widespread impairments to recreational use caused by elevated levels of bacteria that have the potential to pose a direct risk to human health. Multifaceted coordination in the watershed buttresses the established network of interested and engaged citizens and stakeholders, readily available to contribute towards the development of an implementation plan, and to serve as a springboard from which to launch TMDL implementation efforts.

The Water Protection Program will continue to implement TMDL assumptions and requirements via operating permits in the coming years. Significant time will be spent addressing requirements associated with nutrient and low dissolved oxygen TMDLs, primarily, on municipal discharges subject to the previously mentioned TMDL types. Affordability and use re-attainment are expected to be considered in the years to come, exploring the regulatory mechanisms to be used, such as water quality standard variances.

Element 3 - Overview

A total maximum daily load, also known as a TMDL, is a calculation of the maximum amount of a pollutant that a body of water can assimilate and not exceed the water quality criteria. Missouri's Water Quality Standards establish such criteria, or pollutant limits, to protect drinking water, fishing, swimming, aquatic life and other designated uses. In Missouri, the Department of Natural Resources develops TMDL studies for waters that are not attaining these designated uses due to exceedances of the criteria; these studies are planning tools used to restore impaired streams, rivers, lakes and wetlands.

The department and the U.S. Environmental Protection Agency have, together, established 122 TMDLs or TMDL alternatives for Missouri, addressing numerous water body/pollutant impairments. Many of these TMDLs were completed to satisfy requirements of the 2001 consent decree, *American Canoe Association, et al. v. EPA*, No. 98-1195-CV-W. During this time, Missouri's focus was, necessarily, on producing TMDLs according to a fairly rigid schedule. There was little latitude to prioritize or engage in TMDL development beyond the scope of the consent decree, and little time and few resources available for TMDL implementation or other protection efforts.

Following the resolution of this consent decree at the end of 2010, several important and related transitions have begun to take place. Within Missouri, the department's TMDL program has taken this opportunity to renew its attention to implementing TMDLs. The goal is a more comprehensive TMDL implementation plan. Recognizing that guidance and support are critical to achieving the water quality goals of the TMDL.

The purpose of the implementation plans is to serve as guides to local professionals, watershed managers, and citizen groups who may be developing watershed based plans or actively implementing best management practices, or BMPs, in a watershed. Along with incorporating EPA's nine elements for a successful watershed plan, where appropriate, these implementation plans will also address potential BMPs, include a guide to potential sources of funding and participants in the watershed, and provide calculations of pollutant load reductions necessary to meet water quality standards. As a result, a well-developed plan will be a part of the public notice process, along with each TMDL.

Element 3 - Permit Review in 303(d) Waters

TMDL staff review all staff operating permits that may impact an impaired stream

A 303(d) reopener clause exists in all permits upstream of or within an impaired segment. Where a TMDL is completed without any pending permit application, all permits in that watershed are reviewed to make sure they are consistent with the TMDL. These actions may be accomplished by proposing all modifications needed within a given watershed simultaneously, or revoking and reissuing the permits so they share the same expiration date in order that future actions can be more easily accomplished on a watershed wide basis. Modifications to the permits can be made as they normally expire. If facility upgrades or new construction is required to meet more restrictive permit limits, compliance schedules will be identified.

Effluent Limitation Requirements

Development of a water-quality-based effluent limit for point sources must be consistent with the assumptions and requirements of the waste load allocation and TMDL for the particular pollutant. Waste load allocations and TMDLs are to be established at levels necessary to attain and maintain the applicable narrative and numeric water quality criteria. This evaluation requires a certain minimum level of information be provided to ensure the allocation is both reasonable and protective of Water Quality Standards within the acceptable level of uncertainty. U.S. Environmental Protection Agency publishes numerous guidance documents to assist in the writing of TMDLs.

EPA Region 7 works closely with Department of Natural Resources staff during TMDL development. A TMDL is considered final upon EPA approval.

Element 3 - TMDL Public Participation Process

Public review is required for all TMDLs under 40 CFR 130.7.

All TMDLs in Missouri have a minimum 45 day public notice period. This public notice period provides an opportunity for the public to comment on the data, modeling, calculations and conclusions specified in the TMDL document. At a minimum, public notices are mailed or e-mailed directly to EPA, the Missouri Clean Water Commission, the Missouri Water Quality Coordinating Committee, the Missouri Department of Conservation, county soil and water conservation districts, county health departments, watershed groups, state legislators, Stream Team volunteers living in or near the TMDL watershed, and any other relevant agencies or stakeholders. In cases of interstate waters, neighbor state agencies are also given public notice and an opportunity to comment.

Additionally, the department posts the public notice announcement and a water body information sheet, along with the TMDL document, on the department's website, making them available to anyone with access to the internet. Announcement of the public notice period for a TMDL is also issued as a press release to newspapers published in or near the impaired watershed. TMDLs available for public notice can be found on the department's Water Protection Program **public notice website** at <http://dnr.mo.gov/env/wpp/wpcp-pn.htm> and on the department's **TMDL website** at <http://dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-progress.htm>. The department will also

engage the public as needed, or if requested to do so, for solicitation of available data, public meetings and presentations.

Element 3 -TMDL Development

The TMDL process quantitatively assesses the impairment factors so that states can establish water quality-based controls to reduce pollution and restore and protect the quality of their water resources. The purpose of a TMDL is to determine the pollutant loading a water body can assimilate without exceeding state water quality standards. Missouri's Water Quality Standards consist of three components: designated beneficial uses, water quality criteria to protect those uses, and an antidegradation policy.

The TMDL establishes the pollutant loading capacity necessary to meet the water quality standards established for each water body based on the relationship between pollutant sources and instream water quality conditions. A TMDL consists of a wasteload allocation, a load allocation, and a margin of safety. The wasteload allocation is the fraction of the total pollutant load apportioned to point sources. The load allocation is the fraction of the total pollutant load apportioned to nonpoint sources. The margin of safety is a percentage of the TMDL that accounts for any uncertainty associated with the model assumptions as well as any data inadequacies.

TMDLs are typically established where they are needed to bridge the gap between the required effluent limitations, and any relevant pollution controls and water quality standards needed to address water quality problems.

In accordance with EPA guidance, TMDLs are typically scheduled for development within 8 to 13 years from the 303(d) listing for impaired waters. Scheduling may also be determined by the level of threat to human and aquatic life, data availability, department initiatives, recovery potential and stakeholder involvement. The department's current **TMDL schedule** can be found online at <http://dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-progress.htm>.

Element 3 -TMDL Implementation

States are not required under Section 303(d) of the Clean Water Act to develop TMDL implementation plans and EPA does not approve or disapprove them. However, the department will develop and make available for public comment an implementation plan in conjunction with development of a TMDL. The implementation plan will provide information regarding how point and nonpoint sources can or should be controlled to ensure implementation efforts achieve the loading reductions identified in the TMDL. Any management practices already in place or being developed in the watershed to eliminate the impairment will be included in the TMDL implementation plan.

In general, point source reductions are typically implemented through discharge permits administered through the Missouri State Operating Permit program to meet the requirements of Missouri's Water Quality Standards and the National Pollutant Discharge Elimination System (NPDES). Because the department does not regulate nonpoint sources, nonpoint source loading is typically reduced through the use of BMPs that may be implemented to address and improve land use practices that may contribute pollutants to the impaired water bodies. Grant money from the department's Section 319 Nonpoint Source Implementation Program may also be available for implementing nonpoint source controls in the watershed. Nonpoint sources for Section 319 purposes may vary from what is presented in the TMDL. For example, urban runoff regulated by an MS4 permit are point sources for TMDL purposes, but in some instances can be considered nonpoint sources for Section 319 purposes.

Element 4 - Strategic Planning for Future Development

Strategic Summary

Our Missouri Waters

The Missouri Department of Natural Resources has begun an initiative to create a coordinated, holistic approach to protect water resources and preserve our Missouri waters. We've named this innovative statewide watershed approach **Our Missouri Waters** because water, like all of our natural resources, belongs to all of us. We all need to understand and protect our waters to ensure a positive future, and the department needs the help of citizens, landowners, communities, industries and local leaders for this effort to be successful. dnr.mo.gov/omwi

The Clean Water Commission, Safe Drinking Water Commission, Soil and Water Districts Commission and the Well Installation Board, discussed Our Missouri Waters and the Water Resources programs on Oct. 1, 2014, during a joint meeting. The commissioners discussed areas for potential collaboration, establishing a sub-committee to recommend and prepare a plan for state water resources early 2015.

Element 4 - Geographic Information Systems

What Can We Do With Geographic Information Systems?

The Water Protection Program (WPP) has a fairly extensive Geographic Information System (GIS) that has turned into a very powerful tool. The use of GIS allows for the visualization of many aspects that WPP is responsible for, allows for the analysis and helps simplify the overall data management in the program.

Digital mapping tools allow better management of Missouri's water quality standards by the department and allows more transparency during rulemaking processes. The department uses interactive map viewers as its online GIS interface, which allows the public to view and query data in a map setting. For more information on available data, the Missouri Dept. of Natural Resources has released nine **new data sets** depicting subsurface temperatures in various geologic formations and aquifers at <http://www.msdis.missouri.edu/data/newdata.html> .

Visualizing With GIS

The program has used GIS to create feature classes of much of what they are tasked with maintaining and regulating. The first feature class created was the EPA approved 303(d) Impaired Waters list. From there it has grown to include the 305(b) Water Quality Assessment (WQA) List, waters listed in the effective Water Quality Standards (WQS), permits and much more. Being able to visualize these is an invaluable tool to the department as it is now easily shown where things are placed in the state, help check for continuity in regulations and lead to the next major aspect of GIS, analysis.

Analysis With GIS

The real power of GIS lies in its ability to allow for the analysis of the information. This can be accomplished through manual visualization or automated processes such as flow traces, watershed delineations, etc. For the program this has helped greatly in how the various sections can see and work with the data created by each other. A good example of this is in the way that permit writers can look at the location where a facility is applying. They are able to determine what watershed the permit will be in, locate the first receiving water body, first classified water body and if there is any impaired water bodies that may be affected by the feature for which the permit is being requested.

Simplify Data Management

Through the use of GIS we are able to greatly simplify the management of all the data maintained within the program. The first way this is done is through merging the GIS data with the data stored inside the Missouri Clean Water Information System (MoCWIS). By using automated processes to

merge the data together we are able to focus on maintaining certain items in one place or the other. This greatly reduces the risk of information being put in the other system incorrectly when a staff member may be trying to copy it from one to the other. The other benefit of this is a better quality of data which leads to the next section.

What Is The Spatial Accuracy?

The data used in the WPP has evolved greatly since the beginning when the 1:100K National Hydrography Dataset (NHD) was used to build some of the early feature classes. This data is known as a medium resolution data and was a good stepping stone to where we are today. Now we are using the 1:24K NHD which is also called high resolution data. This data was originally built from the United States Geological Survey (USGS) topographic maps. All of our data uses the 1:24K NHD as its foundation making this a very important dataset for us. A good sign of the importance is evident in the fact that we are NHD data stewards for the USGS meaning that we are responsible for making a lot of the edits to the location of water bodies in the state. When it comes time to edit the data we are using leaf off aerial imagery that was acquired in 2008 so there can be some discrepancies from the real world due to the changing nature of water bodies as a result of floods, droughts and other conditions. For a known accuracy our data is +/-40 feet.

What Is The Attribute Accuracy?

The attribute accuracy of the programs data is very good as a lot of redundant data entries have been eliminated. We have been able to create links between GIS and MoCWIS and let processes run overnight to move information around as appropriate. What this means for us is improved use of staff time as the data is only entered once and reduced likelihood of errors for the same reason. This also helps keep the subject matter experts the one who are primarily entering the information giving them a chance to catch any mistakes that might have been missed by somebody who doesn't know the information as well.

How Often Is The Data Updated?

There are two main components to look at when talking about data updates, spatial and attribute. A lot of the attribute data is stored in various aspects of MoCWIS (WQS, WQA and Permitting to name a few). Attributes for each of these are updated at various intervals ranging from every night for things such as permits to every couple of years as needed for EPA requirements or as part of rulemaking. The spatial updates are a work in progress at this time. The goal at this time is to start syncing everything with the NHD once a quarter as we get updates back from the USGS.

How Much Data Are We Maintaining?

The WPP maintains a significant amount of data and the how and when this data is maintained is based on what it is. A quick overview to give the big picture of just how much data is out there is as follows: WQS currently has 10 feature classes being maintained with the majority, Permitting and Compliance has 3, WQA has 13, Total Maximum Daily Loads (TMDL) has 2 and then there are 2 feature classes maintained as part of the NHD stewardship. This is a total of 30 feature classes being maintained at present. This takes a considerable amount of resources to perform the spatial and attribute updates on and would be almost impossible to maintain if it wasn't for the integration of the various systems.

How Dependent Are The Systems On Each Other?

There are three major systems that work in harmony for all of this data to be maintained at a high level of accuracy: MoCWIS, Spatial Database Engine (SDE) (the database system used to store GIS data), Desktop GIS (standalone installed software or web map viewers) and the GIS Editor (a web based mapping tool). If any one of these components has a problem all of them have issues. A perfect example of this is that our WQA staff starts out in MoCWIS to create an impairment record on a water body. Once they have put in the initial information they have the ability to push a "Map It" button. This takes them to the GIS Editor where they are able to actually map where the impairment

is taking place. They don't have to enter any information as to what the impairment is as that information is already been entered into MoCWIS and the systems are designed to talk to each other. If either of those components have a problem the process doesn't work, or if information was to be entered incorrectly then any users of a desktop GIS would end up getting the wrong information and that could in turn affect a permit that might be getting issued. This is just one example of how the data can flow throughout and it is always a multidirectional street that has to be explored very carefully when making changes to any one component.

How Is The Data Dependent On Each Other?

The systems are not the only things that have dependencies built into them. Our data is all dependent on other data when it is being created and maintained. At the highest level is the NHD and this is the foundation for almost everything done. It is due to this dependency that it is critical we continue to maintain our position as NHD Stewards. From there our data continues to build on itself in one way or another. Using one of the newest feature classes built as an example we will take a look at TMDLs to explore why we need to be careful when updating data. To create the TMDLs we had to use the impaired waters feature class (303(d) List) and in some cases the waters shown in the water quality report feature class (305(b) List). Both of those feature classes were created using the waters shown in the Table H feature class and it in turn is created using the NHD. Anywhere along this point if the line work or an attribute is wrong it gets passed from one feature to the next. Now that error that was maybe in the NHD line work has made it all the way into the TMDLs which is being looked at by a permit writer. The permit writer has to make decisions based on what they are seeing. If the error has been propagated throughout, the permit they write may have errors. These errors are no fault of the permit writer as the data has passed through how many different sections before it ever got to them for their job? This is meant to just help highlight once again how we need to look beyond WQS, WQA, etc. and look at the big picture of how a change that may be needed in WQS for example is going to affect everybody else down the line. A plus side of having the data dependency is that it gets more eyes looking back towards the foundation. At any point if an error is spotted it can be mentioned and looked at for correction following whatever process may apply to the error. Once again this is another multidirectional street that just improves the overall quality of what is being done.

Where Is This Heading?

As already discussed the program has come a long ways from 1998 when the first GIS feature class was built to show the impaired waters listed in the 303(d) report. We continue to see that same growth today. Already in the works is to use GIS to show what the proposed rule changes are to water quality standards. This will allow interested parties the ability to actually visualize what is being proposed by the rule and see how it affects them. In turn the hope is that future comments will be able to be accompanied by specific examples and not broad generalizations based only on the wording in the proposed rule. We are also going to work towards having more regular updates with the NHD and synchronizing the data that is dependent on it so everything stays in harmony. These are examples of what is coming. These items, combined with other things that have yet to leave the drafting board, will continue to improve how the program is able to manage its mission.

Element 4 - MOCWIS Monitoring Assessment

The Missouri Clean Water Information System, commonly referred to as MoCWIS, is a web-based application used by the department's Water Protection Program to maintain and manage Missouri's WQS, wastewater permitting and compliance, and water quality monitoring and assessment.

The third portion of the MOCWIS System was implemented to house water quality data that is used to assess the status of Missouri's waters. This system integrates GIS components to link the water quality data with the Water Quality Standards. This allows us to assess waters for compliance with the Water Quality Standards and then build the 303(d) List and 305(b) Report as required by the

Clean Water Act. This system allows us to compile and send this data to the ATTAINS system as well as sending data to STORET. It also allows us to **share the data publicly** using this website: http://dnr.mo.gov/mocwis_public/wqa/waterbodySearch.do

Element 4 - MOCWIS Permits and Compliance

The Missouri Clean Water Information System, commonly referred to as MoCWIS, is a Web based application that is used by the Water Protection Program (WPP) to maintain Water Quality Standards and to manage wastewater permit application and permit data, as well as water pollution inspections and enforcement. There are two modules of MoCWIS – Water Quality Standards and Permitting and Compliance.

The Permitting and Compliance module side of MoCWIS provides numerous benefits. Upon its development, MoCWIS completely integrated three stand-alone systems and portions of a fourth. By doing this, it removed redundant storage and maintenance of data and associated cost, reduced time needed for data entry, improved accuracy of data, and reduced confusion about locations to find specific pieces of information.

MoCWIS Permitting and Compliance allows for WPP staff to capture all aspects of the permitting process. From the application, application payment, draft permit, public notice period, and finally the issued permit. MoCWIS captures the terms and conditions of an issued permit including all parameter's sampling and reporting requirements and narrative conditions, which are also referred to as Schedules of Compliance.

MoCWIS also captures all Compliance Monitoring (e.g., inspections), Compliance monitoring types, work plans, and the subsequent report as well as all enforcement activities for permitted and nonpermitted facilities.

With the capturing of the all the above listed data, MoCWIS also goes one step further. WPP staff also use MoCWIS to conduct reporting for Discharge Monitoring Reports, Applications Status, Public Notice Letter generation, Issued Permit Letters, etc...; thus, remove the need to staff to draft said documents or create said reports.

Element 4 MOCWIS and Water Quality Standards

The Missouri Clean Water Information System, commonly referred to as MoCWIS, is a web-based application used by the department's Water Pollution Control Branch to maintain and manage Missouri's WQS, wastewater permitting and compliance, and water quality monitoring and assessment. Visit the department's MoCWIS Information intranet webpage for more information on these components.

State law delegates the department to administer WQS at the state level and uses tables to list the name, class, designated uses, and extent of protection for individual stream segments and lakes. All resource management activities of Missouri's Water Protection Program focus on meeting WQS. Visit the departments' **Water Quality Standards** webpage for more information.

The integration of MoCWIS WQS with the rulemaking process, along with the administration of online systems such as WQS Public Search, provides benefits to the public and to the department by tracking and reporting WQS and water quality protections. Before these processes were in place, such tracking and reporting of WQS was often inaccurate and inconsistent. Not only do these new systems help correct these problems, they allow the department to project future applications of WQS before they are effective in rule. Furthermore, because of these systems the department has been able to increase the level of public participation by making the WQS process more transparent and understandable.

In conjunction with MoCWIS, GIS is also a vital tool for spatially maintaining, tracking and implementing WQS. For example, when a designated use change occurs, the change must be tracked throughout the rulemaking process, reported so that stakeholders have the opportunity to review and comment, and later implemented through the permitting process. When these changes are reported within a GIS interface, stakeholders are able to see the revisions in a GIS data table, query the different changes according to interest, and visually compare the changes on a map.

WQS staff are moving to report specific types of changes, such as use changes, within the GIS interface. Stakeholders will be able to see revisions in an attribute table, query the different changes according to interest, and be able to visually compare the changes on a map.

The use of GIS and the MoCWIS business applications are beneficial to the public and to the Department for tracking the location and type of water protection attained through the Clean Water Act. The automatic coordination of MoCWIS with other business systems such as Water Quality Assessment and online systems such as ePermitting provide additional benefits. Before these systems, a detailed history of Water Quality Standards protections were not kept, leaving some applications of WQS protections questionable. By using these systems we have been able to correct these inaccuracies as well as see issues with future applications of WQS protections before they are effective in rule. Furthermore, because of these systems we have been able to increase the amount of public participation by making it easier to understand where Water Quality Standards apply and how they are applied to certain waters within the state.

GIS is vital to maintaining the location of WQS protections but also for implementing future WQS protection changes. For example, when a water quality use change does occur due to a Use Attainability Analysis by a permittee, the use change must be tracked throughout the rulemaking process and reported so that stakeholders have the opportunity to comment and review the use change.

Currently, a use changes document must contain two additional types of font, bold and italics, to display the changes in 8-point font. A single table in rule, Table H, is over 110 pages and will grow substantially with the approval of the Interim 2012 rulemaking applying designated uses to the 1:100,000 extent of the National Hydrography Dataset (NHD). The table documents are lacking information required by staff and stakeholders to track WQS protections, including a Water Body Identification number (WBID), that is unique to a water body's protections, is used in WQA, Permits and TMDL Units in reporting the Impaired Waters List (303(d)) and the State's Water Quality Report (305(b)), to name a few.

With the incorporation of GIS, WQS staff are moving to report these specific types of changes, within the GIS interface. Stakeholders will be able to see the revisions in an attribute table, query the different changes according to interest, and be able to visually compare the changes on a map.

GIS use is necessary to maintaining accurate data, communicating with stakeholders and the EPA. It is expected that State submissions to EPA will be required to include GIS data in the near future.

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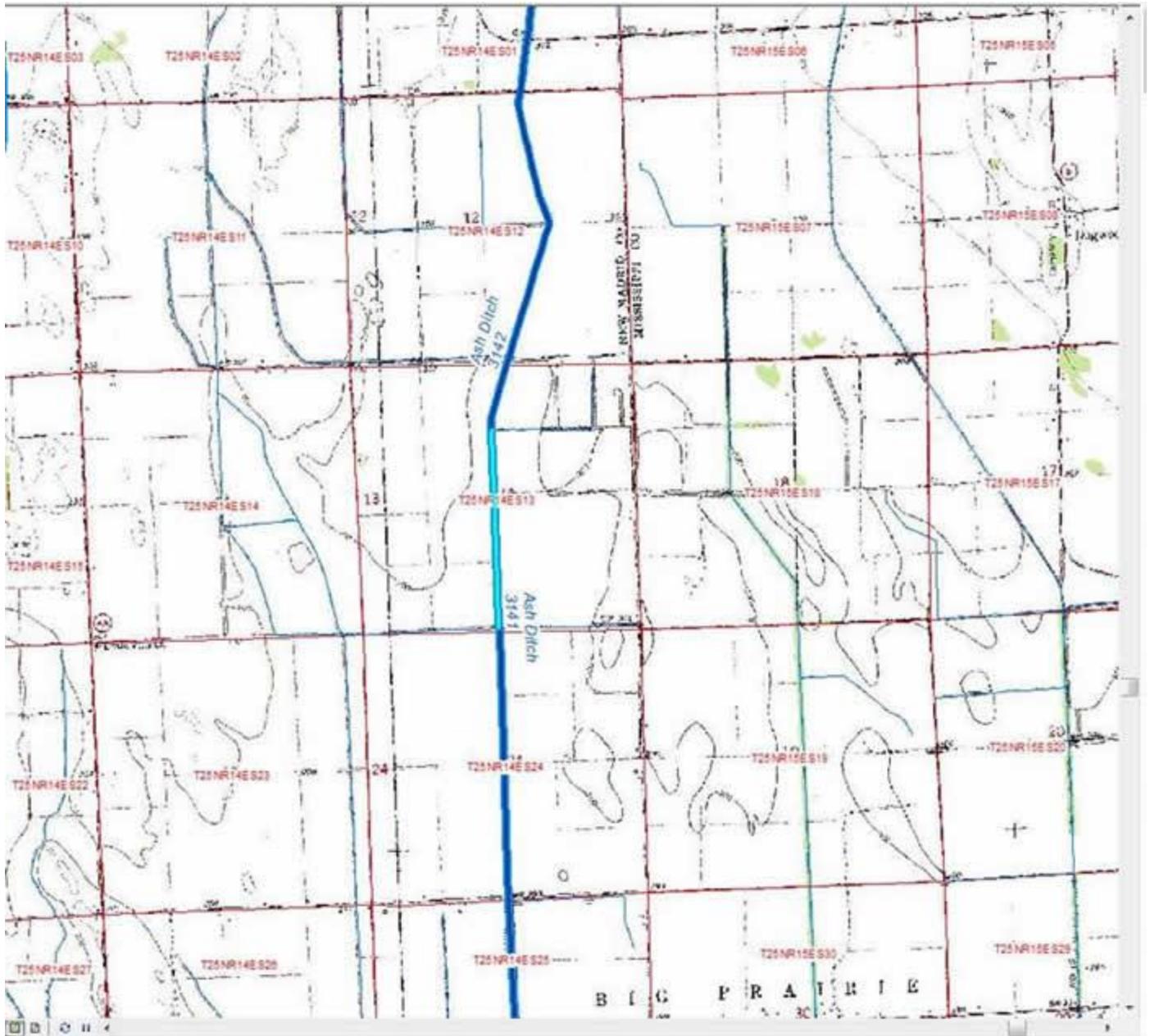
Here's a screen shot showing how Table H changes in WQS protections are currently reported in the rulemakings, via a rich text formatted word document. The example I'm using here is Ash Ditch in New Madrid County. As shown in the screen shot there are two listings for Ash Ditch, a Class P and C. The only way to tell the difference between the two listings in the word document is by looking at the other attributes. This is because there is no room in the Word document for other important information such as the WBID or watershed information such as Hydrologic Unit Codes (HUCs).

Additionally, the extents of WQS protections are being combined under one listing of Ash Ditch, resulting in one listing being deleted (italic font) and the other being extended (bold font for "TO"). This change can be hard to visualize and determine how it will affect other department staff or stakeholders until it is seen on a map with other location information and datasets such as drinking water intakes or park boundaries.

TABLE H-STREAM CLASSIFICATIONS AND USE DESIGNATIONS

WATER BODY	CLASS	MILES	FROM	TO	COUNTY	COUNTY 2	IBR	LWW	AQL	CLF	CFD	WBC	SCR	DWS	IND
100 K Statewide Extent	C	84,845.0	Statewide	Statewide	Statewide		x	x	x			B	x		
AB Cr.	C	4.2	Mouth	32.37N,18W	Dallas	Caaden		x	x			B			
Ackerman Ditch	C	14.1	Mouth	24.24N,6E	Butler		x	x	x			B			
Ager Cr.	C	4.8	Mouth	24.61N,34W	Andrew			x	x			B			
Alder Br.	C	4.7	2.34N,26W	5.34N,23W	Cedar			x	x			B			
Alder Cr.	C	11.4	Mouth	21.33N,28W	Cedar			x	x			B			
Allen Br.	P	1.8	Mouth	22.37N,1E	Washington			x	x			B			
Allen Br.	C	1.5	22.37N,1E	34.37N,1E	Washington			x	x			B			
Allen Br.	C	3.0	Mouth	05.34N,05E	St. Francois			x	x			B			
Allen Cr.	C	6.4	Mouth	13.53N,12W	Monroe			x	x			B			
Alley Br.	P	1.5	Mouth	23.29N,3W	Shannon			x	x			B			
Alley Br.	C	2.6	23.29N,3W	22.29N,5W	Shannon			x	x			B			
Allie Cr.	C	2.6	Mouth	1.33N,10E	Cape Girardeau	Bollinger		x	x			B			
Anderson Br.	C	1.0	Mouth	31.45N,20W	Petta			x	x			B			
Anderson Cr.	C	1.9	Mouth	31.33N,9W	Texas			x	x			B			
Andrews Br.	C	1.8	Mouth	See 3062.17N,6E	St. Francois			x	x			B			
Anthony Br.	P	0.5	Mouth	6.22N,5W	Oregon			x	x			B			
Azzie Cr.	P	1.9	Mouth	34.44N,4E	St. Louis			x	x			B			
Apple Cr.	P	44.8	Mouth	21.34N,10E	Perry			x	x			A	x	x	
Apple Cr.	C	1.7	21.34N,10E	18.34N,10E	Perry			x	x			B			
Arapahoe Cr.	C	8.0	Mouth	11.61N,36W	Andrew			x	x			B			
Archie Cr.	P	1.2	Mouth	14.41N,20W	Benton			x	x			B			
Arnold Br.	P	2.2	Mouth	10.38N,2E	Washington			x	x			B			
Arnold Br.	C	1.0	10.38N,2E	15.38N,2E	Washington			x	x			B			
Arnold Cr.	C	1.1	Mouth	24.40N,1E	Washington			x	x			B			
Arthur Cr.	P	5.9	Mouth	14.51N,9W	Texas			x	x			B			
Arthur Cr.	C	2.3	14.51N,9W	25.31N,9W	Texas			x	x			B			
Ash Ditch	P	6.6	Mouth	11.25N,14E 5.26N,13E	New Madrid New Madrid			x	x			B			
<i>Ash Ditch</i>	<i>[C]</i>	<i>[8.0]</i>	<i>[11.25N,14E]</i>	<i>[5.26N,13E]</i>	<i>[New Madrid]</i>	<i>[Mississippi]</i>	<i>[x]</i>	<i>[x]</i>	<i>[x]</i>			<i>[B]</i>			
Ash Slough Ditch	P	17.2	Mouth	33.26N,13E	New Madrid		x	x	x			B	x		
Ashes Cr.	P	8.7	Mouth	4.30N,23W	Polk	Greene		x	x			B			
Asher Cr.	C	4.0	4.30N,23W	14.30N,23W	Greene			x	x			B			

When **GIS is used then the changes can be seen visually**. For example, in the screen shot below I used the identify tool to show where Ash Ditch Class P currently stops. In the revised GIS dataset below, Ash Ditch Class P (WBID 3141) would be shown to include the extent of Ash Ditch Class C (WBID 3142), showing that WBID 3142 has been deleted and replaced with the protections of WBID 3141.



Instead of seeing the changes in a Word document the user could query the change of choice, for example Ash Ditch, and see all the changes that are being proposed, plus the user could select an individual change and zoom to it on the map to see a visual of the change. This will make it easier for stakeholders to find changes in their area of interest, whether it's their watershed, county, neighborhood, etc.

Additional information will also be available that is currently kept in an Oracle database and restricted to certain staff. With the use of GIS views, the information in the database can be displayed without having to allow stakeholders into the database itself. Stakeholders will be able to view such information as the status of the WQS protections (effective vs. proposed) as well as if the changes have been denied or held for a future rulemaking. In the Ash Ditch example, the stakeholder can see in a section of the GIS view below that WBID 3141 is being revised while WBID

The Department of Natural Resources has been using the NHD to support a growing number of business processes and has launched a Web application designed to automate applying for and obtaining National Pollutant Discharge Elimination System (NPDES) permits.

The application relies on the Watershed Boundary dataset, NHD Flowline, and NHD Waterbody features to determine outfall locations in each watershed and to determine which NHD features receive flow from those outfalls. In addition, the application determines the distance from each outfall to the receiving water body. However, using NHD Flowline features in major rivers does not calculate an accurate distance since the flow lines are often near the middle of the channel. The Missouri DNR would like to use the NHD Area features for these calculations to improve the accuracy of these features.

Missouri Water Quality Standards (WQS) GIS feature classes are created using the NHD as the reference layer. In order to incorporate changes made as part of the stewardship, the NHD is downloaded quarterly and synchronized with the specific WQS.

Element 4 - Nonpoint Source Management Planning

With the enactment of Section 319 of the Clean Water Act of 1987, federal financial assistance was authorized for the implementation of state Nonpoint Source Management Planning programs. Since 1996, state nonpoint source (NPS) management planning has increased as a direct result of the U.S. Environmental Protection Program (EPA) providing grants to states to implement NPS programs. Missouri's NPS Management Plan (NPSMP) is prepared by the department in cooperation with partner agencies and Missouri citizens in response to the requirements of Section 319.

The goal of NPS planning is to achieve water quality standards at the earliest date possible. Watershed-scale plans to manage water resources take various forms in order to respond to local situations. Projects may be prioritized according to effectiveness in reducing pollution regardless of the watershed. Conversely, emphasis may be placed on impaired or threatened watersheds.

Control of NPS pollution sources, such as runoff from farms, cities, mining areas and construction sites, is still essentially a voluntary program, and addressed by the NPS program utilizing the NPSMP. Missouri periodically reviews and evaluates its **NPSMP**, revising it every five years. The EPA requires that states outline the NPS pollution categories and subcategories they must address.

The two focus areas for restoration activities in NPS management planning include the development of voluntary watershed-based plans (WBP) and Total Maximum Daily Loads or TMDLs for point and nonpoint sources and the implementation plans for watershed restoration projects. Missouri's NPSMP supports implementation of voluntary WBPs and/or TMDLs. Assembling a framework for a voluntary WBP can be approved within the TMDL process and be included within the restoration plan. The voluntary WBP and the TMDL inform citizens of their watershed's status and provide for public participation by providing incentives for voluntary action and the tools to allow locally led groups to be effective. The Clean Water Act directs states to focus substantial efforts on the restoration of impaired waters. Funding pursuant to Section 319 is required to be used for restoration projects. Missouri considers this requirement in prioritizing its NPS grant activities.

The Spring River NonPoint Watershed Management Plan has been a collaborative effort of stakeholders in several counties -

Water quality can be improved in the Spring River Watershed through Best Management Practices (BMPs). This Watershed, originating in southwest Missouri, flows downstream to southeastern Kansas and into the Grand Lake O' the Cherokees in Oklahoma. The water quality impairments in this watershed, the pollution, stream bank erosion, and septic system and stormwater runoff problems, offer many opportunities for continued planning and coordination.

The program is expanding its use of GIS as it implements the Our Missouri Waters Initiative and begins permit synchronization. Permit synchronization is having all the permits in a specific watershed expire at the same time. GIS is needed to make permit decisions in the Spring River Watershed. The watershed includes portions of Barry, Barton, Christian, Dade, Jasper, Lawrence, Newton and Stone counties as well as Carthage, Neosho and Joplin, (see Element 4, NPDES, Figure 5, Spring River Watershed).

Element 4 - NPDES Permits

Geographic Information Systems (GIS) are an important component of the Water Protection Program's permitting actions. GIS is used in a variety of ways to help develop protective permits and permit information. GIS through its data layers can provide locational data, UTM coordinates, permit numbers, legal description, stream impairments, location of losing stream, the receiving waterbody, waterbody identification number, hydrologic unit codes, ecological drainage area and addresses. GIS is used from pre-permitting activities to permit drafting and issuance for general and site specific permits. With the Program transitioning to a watershed approach for permitting and the use of E-Permitting, the role and importance of GIS is growing in the permitting process.

GIS is used in a variety of ways to help develop protective permits. GIS tools are used through the Program's interactive Map Viewer and through ArcGIS. GIS through its data layers can provide locational data, UTM coordinates, permit numbers, legal description, stream impairments, location of losing stream, the receiving waterbody, waterbody identification number, hydrologic unit codes, ecological drainage area and addresses. GIS is used from pre-permitting activities to permit drafting and issuance for general and site specific permits.

The majority of permit writers use the customized Map Viewer to gain information on the facility. The customized Map Viewer was developed by ITSD staff and contains a lot of information related to the water program and the facilities permitted. The Map Viewer contains the information in MoCWIS as related to permitted facilities. It has all the locational information needed for writing a permit. Customized Map Viewer is the most common GIS tool used by permit writers, however ArcGIS is to help answer questions or to plot maps that are complex. ArcGIS is limited in permitting, as there are not enough licenses. There are a few people in the section that are equipped with GIS to do permitted feature verification in MoCWIS and to create maps for complex sites or when requested.

Prior to a permit being drafted, GIS is used in Antidegradation Review. The Antidegradation Review process uses GIS for determining existing dischargers around a proposed new treatment plant. If there are existing treatment plants, it adds a question on why connection to an existing facility was not pursued. Another use for GIS during the Antidegradation process is to see if the stream is losing, located in a sinkhole area, on a 303(d) impaired stream, if there is a beneficial use that needs to be considered in the development of effluent limits, and to help determine the existing water quality and assimilative capacity of the receiving stream. If the proposed discharge is new and in an area without many other dischargers, GIS has been used to determine the direction water flows to get the first classified stream. GIS in the Antidegradation Review is focused on characterizing the area and the stream, based on the preliminary outfall location. In the figure below, the map is a proposed discharger looking to disconnect from one treatment plant (KC Birmingham) and build their own treatment plant. By mapping the stream segment, it shows there are multiple dischargers in that segment of the Missouri River.



Figure 1: Missouri River dischargers around the proposed Liberty WWTP

When a permit is being drafted, GIS is used in characterizing the receiving stream (303(d), losing, sinkholes) and to characterize the actual location with UTM coordinates including the legal description (NW ¼, NW ¼, Sec. 13, T51N, R34W or landgrant #2379). By plotting the UTM coordinates or selecting the permit number, the mapping programs place a locational mark on the map. Using the data layers available, a permit writer can get information related to the facility, including the information above and the ecological drainage unit (EDU) name, hydrologic unit code (HUC) and impairment.

Many counties in the state have developed online GIS systems, which also are used by permit writers. An example of an online county GIS system is Jasper County's **map**, which can be used to help determine downstream landowners of a permittee. In a permit application, the facility is requested to name the first downstream landowner; however with the large facilities there may be multiple downstream landowners.

There are permits issued by the department that have a large number of permitted features associated with them, such as the MS4 permits or Combined Sewer Overflow (CSO) permits. The locations are given by the permittee, usually in GPS coordinates, and then it's the permit writer's responsibility by using GIS to get all the information required in a permit. These locations are required to be covered in the permit and MOCWIS, thus all permitting information regarding location is needed, as there may be monitoring requirements in the permit tied to a location. The blue triangles below are the location of Kansas City's combined sewer overflows. The map shows that the combined sewer overflow locations cover a large distance and may be close together or separated by a distance, they may be next to a major river (ie: the Blue or Missouri Rivers) or in the middle of a neighborhood.

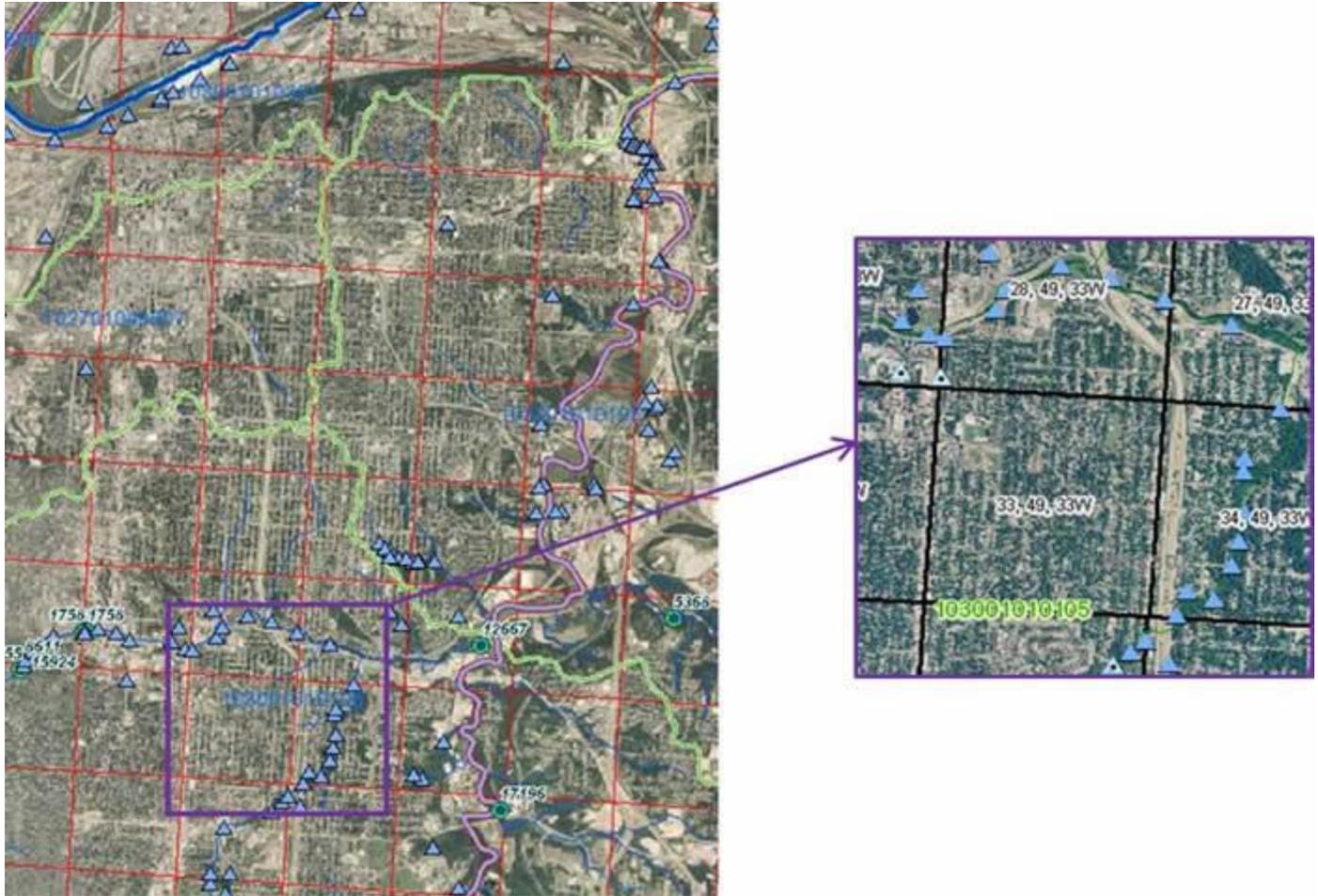


Figure 2: Kansas City Combined Sewer Overflow Locations

During the permit drafting, public notice, and issuance process, GIS is used to verify the location and the permit matches the MOCWIS location. At this point, the receiving stream, HUC, UTMS, and legal description must match between the permit, MOCWIS and GIS. This requires making the permit and MOCWIS match, then verifying with GIS program that the permitted feature matches the permit and MOCWIS in all categories when it is plotted. This is verified by trained GIS users in ArcGIS, not in Map Viewer or CARES programs.

Besides being used in site specific permits, GIS is important in the general permit process to ensure the general permit requirements are met (ie: not located in a losing stream or Outstanding National Resource stream). A new component of the Program's use of GIS is the E-Permitting process for land disturbance permits, which allows the applicant to draw the shape of the proposed disturb location on a 1:24,000 map and then the electronic processing makes determinations about where the runoff will flow. This is a new process for the Program and Department, but is expected to grow to include more general permits the Program issues. Allowing the permittee to draw their location and then having an autofill in the background of all the locational information tied to pour points will increase efficiency and allow applicants to get their permits quicker.

As water protection is a large program covering different aspects of water pollution (industrial, municipal, stormwater, etc), permit staff are often asked to make maps detailing the locations of certain types of permits, such as **Animal Feeding Operations**. This information is used in public meetings, discussions, department's webpage, and educational opportunities to answer questions and to help with planning.

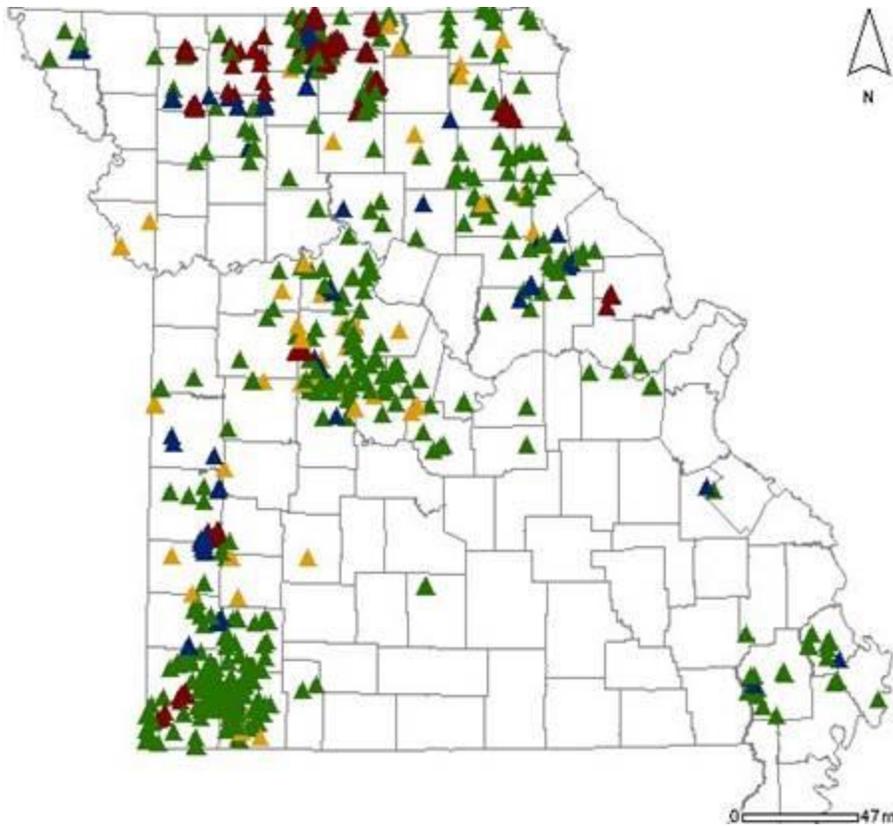


Figure 3: Animal Feeding Operations Map

Besides permits of a certain type, maps detailing permits in a certain area are requested to help with regionalization planning, total maximum daily load (TMDL) modeling, monitoring schedules and/or inspections. The figure below of Lake of the Ozarks was a map put together by request for a list of all the permitted facilities around Lake Ozark State Park. By creating the map in GIS, along with the map, an excel spreadsheet of permittees, permit addresses, owner's names and addresses, and design flows was created.

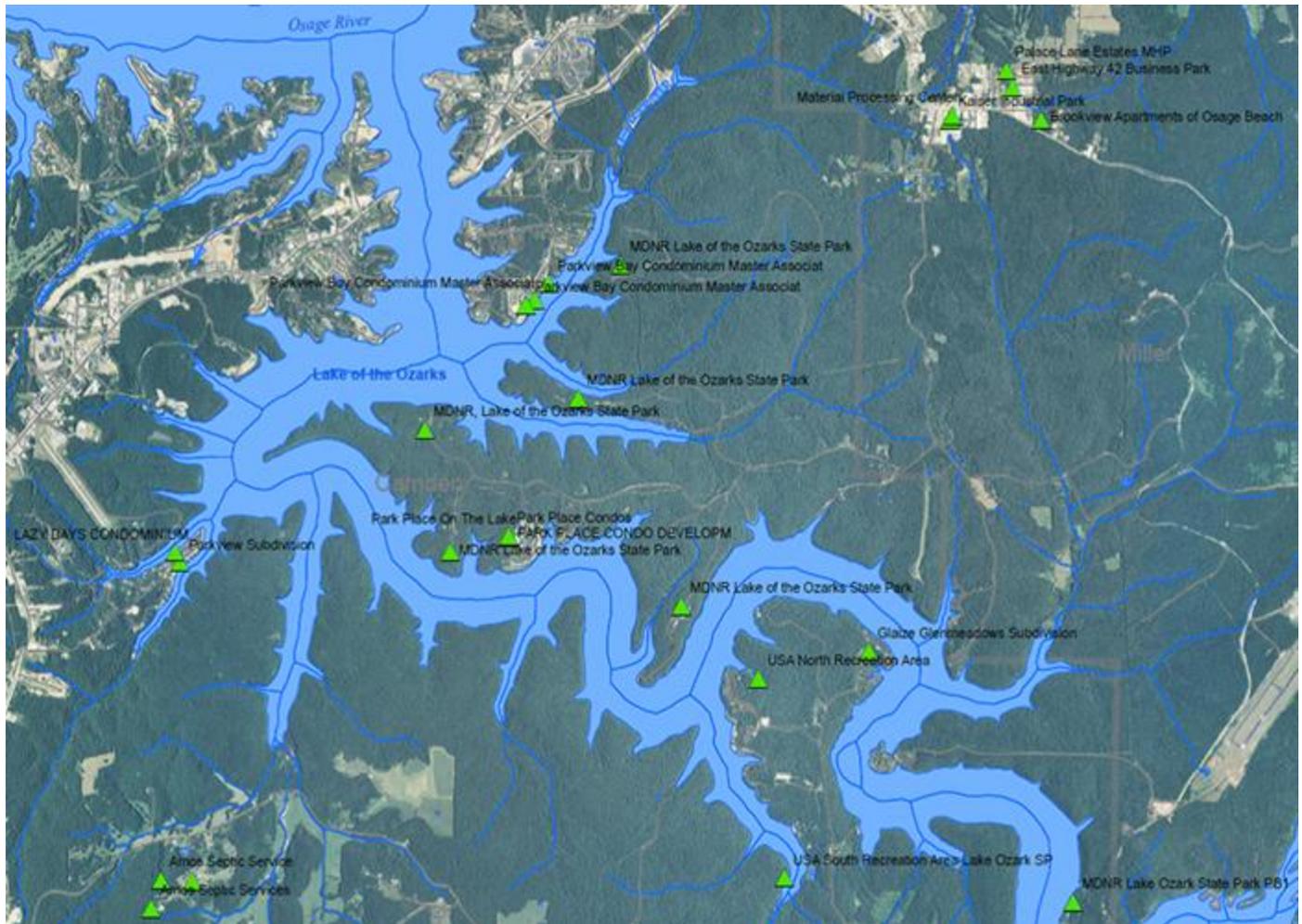


Figure 4: Dischargers around Lake Ozark State Park

The Program is expanding its use of GIS as it implements the Our Missouri Waters Initiative and begins permit synchronization. Permits synchronization is having all the permits in a specific watershed expire at the same time. An example where the capabilities of GIS will be used in making permit decisions is the Spring River Watershed located in southwest Missouri and includes portions of Barry, Barton, Christian, Dade, Jasper, Lawrence, Newton and Stone counties and includes Carthage, Neosho and Joplin. This is an interstate watershed that originates in Missouri, flows downstream into southeastern Kansas before being received by the Grand Lake O' the Cherokees in Oklahoma. In Missouri the Spring watershed is 2,271 square miles and contains 331 miles of permanent flow with 188 miles of intermittent streams and numerous losing streams and springs. Impairments within the watershed includes bacteria, metals, nutrients and biological impairments. By synchronizing permits in this watershed, the department has the opportunity to implement TMDLs on the basin at the same time, work on addressing the historical issues, begin addressing water quantity issues and the ability to conduct monitoring in the appropriate locations. Besides TMDLs for Missouri there are TMDLs in Kansas dealing with the impairments on the streams that need incorporated into permits. In the portion of Spring River watershed below, the information drawn from ArcGIS includes wastewater outfalls, stormwater outfalls, AFOs, losing streams, 303(d) streams, MS4 permits, unclassified streams, drinking water wells, and the towns located within it.

Element 4 – Municipal Separate Storm Sewer Systems (MS4s)

Urban stormwater management receives significantly less attention in water quality protection decisions than that given to domestic wastewater and drinking water systems. However, stormwater regulations have been evolving to require greater protection and restoration efforts of urban water bodies and their contributing watersheds.

The federal National Pollutant Discharge Elimination System (NPDES) program engages a set of regulated MS4s across the nation, of which 164 are now permitted or have applied for permitting in Missouri. Regulated MS4s are required to implement stormwater management practices in the areas of new and redevelopment, illicit discharge control, municipal operations and public education and involvement. The three major MS4s must also perform stormwater quality monitoring and assessment, regulate industry and employ greater stormwater quality efforts in roadway and flood control projects. MS4 permits also require restoration where TMDLs apply.

Of particular challenge to regulated MS4s is the need to employ state-of-the-practice strategies, methods and technologies in new development and redevelopment that may be contrary to conventional stormwater management. Specifically, this stormwater paradigm shifts the thinking away from large curb/gutter/basin systems and towards the application of smaller-scale, distributed on-site retention practices that aid infiltration, evapotranspiration and reuse. This shift induces a local need for significant education and outreach, changes to ordinances and codes, and the establishment of stormwater quality performance criteria and standards.

To aid their regulated MS4s, several state NPDES permitting authorities have established stormwater quality performance criteria and control specifications for development projects, such as Minnesota, Michigan and Wisconsin in the Midwest, as well as Washington state and several others across the nation. EPA has developed several resources dedicated to green infrastructure and low impact development to aid this endeavor. In 2013, EPA released the **National Stormwater Quality Calculator** to assist site developers, landscape architects, urban planners, and homeowners in selecting on-site stormwater quality control measures. Comprehensive performance data for stormwater quality control measures is also available in the **international bmp database**.

What Missouri is currently doing to assist MS4s in meeting the most challenging aspect of the MS4 Program:

The department published the *Missouri Guide to Green Infrastructure: Integrating Water Quality into Municipal Stormwater Management, May 2012*. This how-to guide for regulated MS4s was presented in several workshops across the state in 2012 and 2013, and it is publicly available at the Missouri **Stormwater Information Clearinghouse**. The guide aids MS4s in implementing effective municipal stormwater management programs for developers while complying with NPDES requirements. In addition, the department provides administrative reviews and assessments of the MS4 programs, including feedback to the MS4s. This feedback elicits improved steps toward MS4 compliance. On a limited basis, the department has included green infrastructure requirements in consent decrees.

To assist MS4s in meeting the most challenging aspect of the MS4 Program:

- Augment the science and its application in state-of-the-practice stormwater runoff quality control.
- Call upon partners and stakeholders to aid in the department's stormwater management decision process toward restoration and protection of the state's aquatic resources, especially in the area of developing stormwater quality performance criteria;
- Consolidate a set of methods, technologies, asset management tools, performance measures and other tools to aid best development practices and watershed restoration through state-of-the-practice.

- Develop tools from these resources, such as site planning/design/performance criteria, a stormwater management manual of specifications, model ordinances, demonstration projects, stormwater financial asset management strategies and tools, etc.
- Promote the tools for use in State of Missouri projects.
- Promote the tools for use in best development practices across the state.
- Promote the tools for use in restoration projects across the state.
- Make the tools available to communities.

Element 4 - TMDL and GIS

There are several ways in which GIS applications are used in the total maximum daily load, or TMDL, process, with the potential for even greater integration. Currently, waters that have an approved TMDL, including streams and lakes, are mapped as GIS features. These geodatabases are available both internally on the department's GIS network, and externally on the department's online interactive map viewer. As a result, this information is available to the general public, as well as to department staff for applications such as TMDL development, water quality assessment, permitting, and nonpoint source planning.

GIS is also used during TMDL development to perform spatial analysis of land cover and land use, soil types and conditions, population estimates, and potential sources of pollutants or impairment. It is also used for creating maps within TMDL documents and for displays and public presentations.

The TMDL Unit continues to explore ways in which GIS applications may be utilized for TMDL prioritization and to help support TMDL implementation.

The use of geospatial techniques to address water quality issues under the framework of the US Environmental Agency's (EPA) Total Maximum Daily Load (TMDL) program has resulted in a cost-effective and research quality solution to TMDL issues. A TMDL is the calculated maximum amount of a pollutant that a water body can receive without violating the water quality standard for its intended use.

Geographical Information System (GIS) layers contain several forms of essential data for inputs to predictive modeling. Here are a few examples:

- Watershed characteristics: GIS layers include 8, 10, and 12 digit watershed boundary data (WBD). National Elevation Dataset (NED) and contour files are useful in delineating watersheds that are only partially defined by the WBD layer. From these files, information such as flow direction, slope, and overflow velocity can be calculated.
- Land cover: Runoff potential toward a stream is highly influenced by land surface characteristics. Impervious surfaces, cropland, grassland and forested areas all have different capacities to absorb precipitation and significantly influence the nonpoint pollutant load a stream may receive during precipitation events. Modeling may include testing the types and placement of best management practices, and this information, as well as slope characteristics, is an essential part of the equation. GIS land cover files and aerial photography provided by the National Agricultural Imagery Program (NAIP) provide this type of information.
- Spatial relationships: Locations of point source discharge and their proximity to classified water bodies are essential factors in calculating the pollutant load that is reaching the stream or lake in question.

Many computer simulation models have been designed to calculate the myriad interactions on the landscape and within a water body that affect water quality. Some of these models are designed for watershed level analysis, and others are more focused on hydraulic and biochemical influences.

Element 4 - Financial Assistance Center (FAC) Wastewater Construction Permitting and GIS

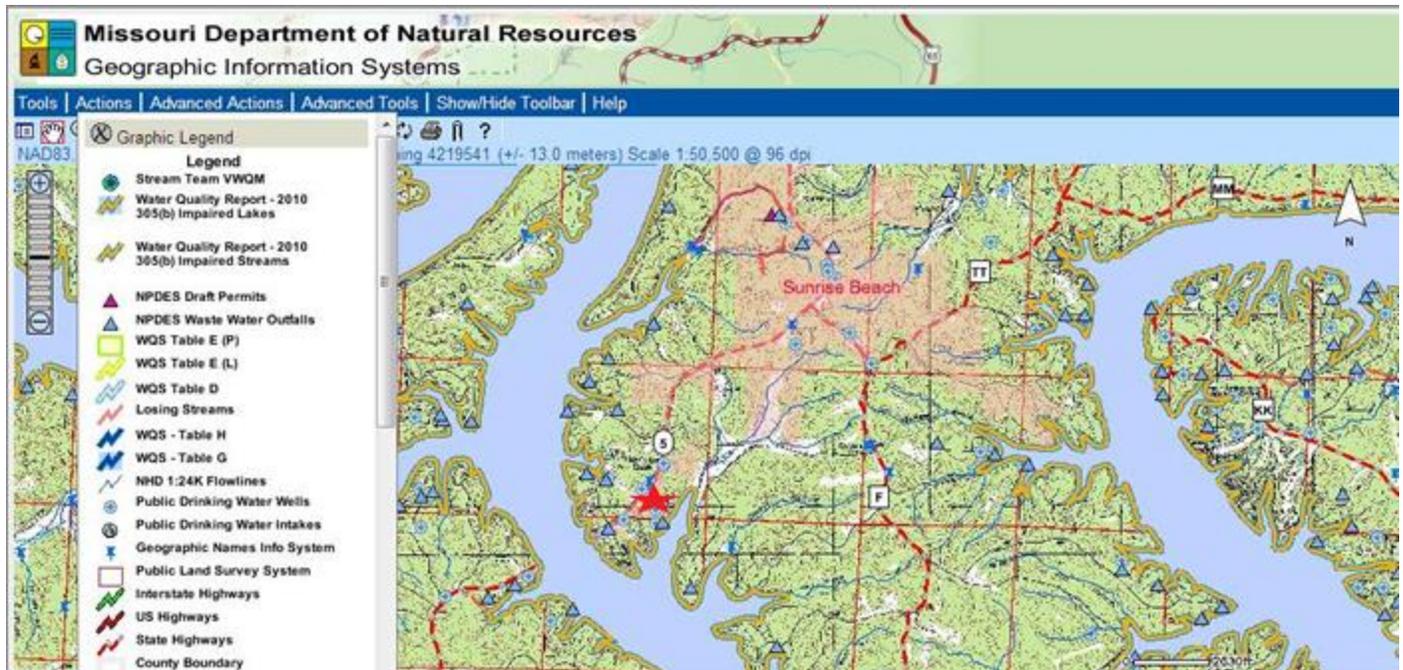
The use of the customized Water Pollution Control Branch Map Viewer allows engineering staff to locate proposed or existing wastewater systems. When a construction permit is received, Department staff locates the site of the proposed project in order to determine the relative distances to drinking water supplies, streams, lakes, geologic features, residences, and other existing wastewater treatment facilities, etc. With this locational knowledge, a preliminary environmental impact of the project can be determined. Staff may comment on the location of the proposed site and potentially question whether another site may be more suitable to the needs of the permittee with a lesser environmental impact.

A general example of the process and use of the Map Viewer is below.

A construction permit application for a new wastewater treatment facility and collection system is received by the Department. Engineering staff review the construction permit and use the Map Viewer to locate the proposed wastewater system. Staff determines that an existing wastewater treatment facility is located nearby the proposed site. Department staff would then send comments to the permittee asking whether regionalization was evaluated with the nearby wastewater treatment facility and the cost effectiveness of this option. The Department promotes regionalization in the effort to limit the number of discharges to waters of the state. The permittee could then decide to pursue regionalization and construct a collection system to the nearby wastewater treatment facilities.

A specific example and a screenshot of the Map Viewer is below.

The Village of Sunrise Beach intends to construct a wastewater treatment facility and collection system to serve the Village. Part of the proposed project includes connecting currently permitted wastewater treatment facilities in order to regionalize and provide wastewater service to the Village. Department staff located the proposed wastewater treatment facility in the Map Viewer to determine the possible number of existing permitted wastewater facilities that may be connected to the new wastewater system. The proposed wastewater treatment facility location is indicated with a red star. The permitted wastewater treatment facilities are marked with a blue triangle in the Map Viewer. This data allows Department staff to assess the existing wastewater treatment facilities that will be connected to the regional wastewater treatment facility proposed by the Village.



Currently department engineering staff uses the Map Viewer to locate proposed construction wastewater systems. At present but predicted to be more prevalent in the future, communities will use GIS to map their wastewater collection systems. The communities can use this information to determine exact locations of utilities and to aid in scheduling repairs and rehabilitation endeavors. Communities could then provide the Department with accurate locational information on the plans, when applying for a sewer extension construction permit.

Element 4 - 401 Water Quality Certification

The Federal Clean Water Act requires the protection of “Waters of the United States.” Therefore, the federal government initiated a process that included federal permitting over certain activities in jurisdictional waters. The permitting process known as Section 404 permitting was assigned to the U.S. Army Corps of Engineers. The Clean Water Act also established a process whereby those permits issued under Section 404 could only be effective if certified (or waived) by the state within whose boundaries the applicable waters lay. This provision for state certification is found in Section 401 of the Act, hence the common nomenclature of “401 Certification.”

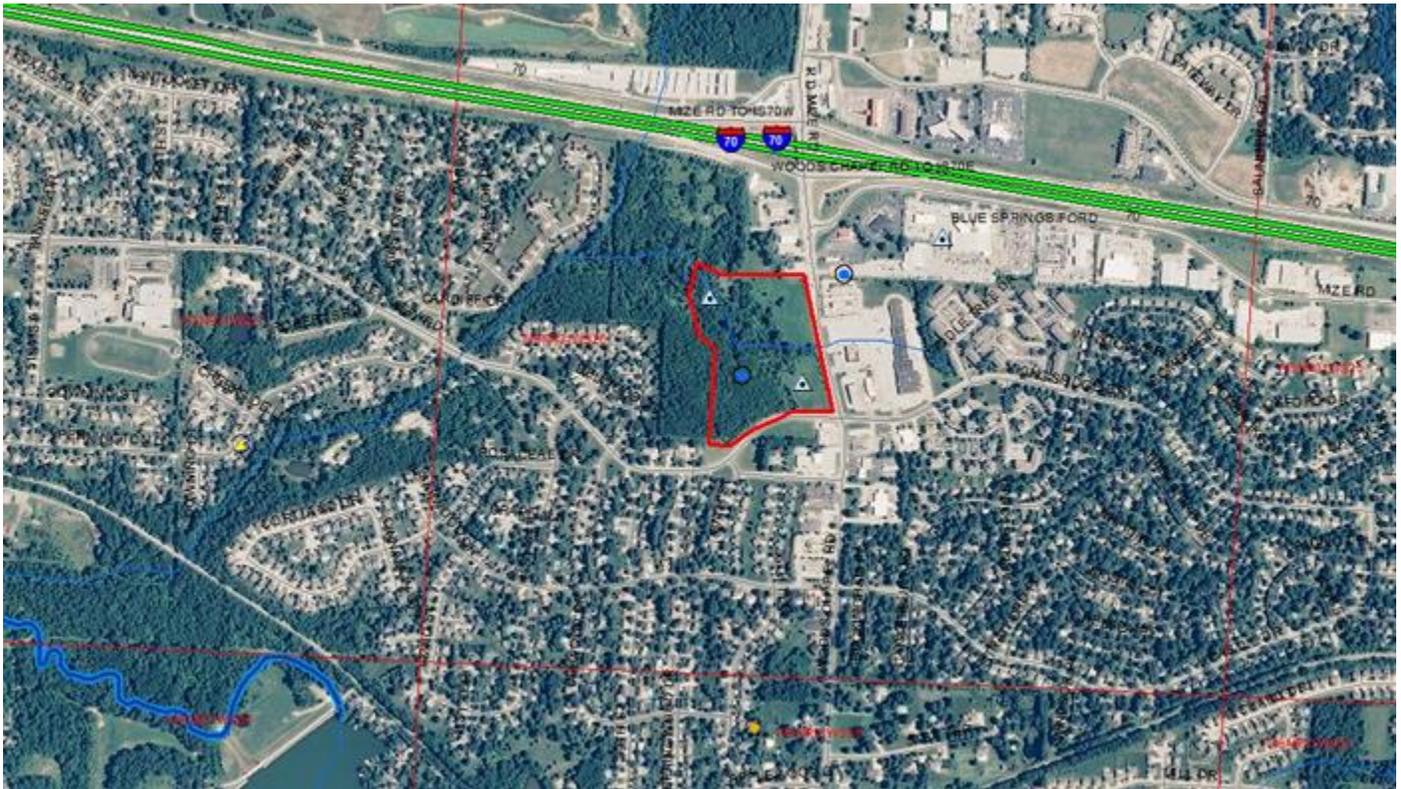
The Section 404 Department of the Army permits are not the only federal action whereby a 401 Certification may be needed. The Clean Water Act grants direct authority to each state and tribe to ensure that local water quality standards are met when a federal action (permits, license, etc.) occurs, including but not limited to:

- Clean Water Act Section 404 Department of the Army discharge of dredge and fill permits
- U.S. Coast Guard permits
- Federal Energy Regulatory Commission licenses
- Nuclear Regulatory Commission licenses
- National Pollution Discharge Elimination Systems permits.

Section 404 permitting is by far the most abundant federal action requiring 401 Certification. There are three types of 404 permitting; Nationwide General Permits (NWP), Regional General Permits

and Individual Permits. The first two are general permits that can cover many projects of similar activity with minimal to no impacts to the environment. The NWP are renewed on a five year cycle. During this renewal period all NWP, as well as any new activities, are evaluated across the nation. States are given the opportunity to update the corresponding 401 certifications.

Individual permits are necessary when the project cannot be conducted under the conditions of a NWP or Regional Permit. Proposed projects whether permitted with a NWP or an individual permit are evaluated for avoidable adverse impacts to the environment. Unavoidable adverse impacts require compensatory mitigation. The individual permit requires a more extensive review of the project information. The proposed project is placed on public notice. During the public notice period, staff review the merits of the proposed project based on the limited information provided in the public notice, requests additional information if needed, and reviews existing spatial data. Figure 1 is an example of digital imagery reviewed by staff and used to determine the project location.



Staff delineates the project area and reviews applicable data, such as stream locations, potential for wetlands with the National Wetland Inventory, impaired waters, and sensitive waters. Figure 2 is an example of the data evaluated as part of this process. After reviewing all available information, staff sends their comments to the Corps. All comments are evaluated by the Corps. The applicant is given the opportunity to respond to the comments.



Project purpose and need as well as public interest factors are evaluated against alternatives in order to minimize negative impacts to the environment. Unavoidable adverse impacts require compensatory mitigation. The Corps will review the certification requirements, any responses to comments and make a permit decision. If a permit is issued the 401 Certification becomes a part of the federal 404 permit for that project.

A 401 Certification is the state's approval of the project for the issued permit. The certification will contain conditions that assure that the water quality of the state's waters is protected from the direct or indirect effects of the project as proposed. Although it is the intent of the department to certify each project, if it is determined that the project will negatively impact water quality, the department may deny 401 Certification.

ArcMap is also used when evaluating the appropriate location and possible threats to proposed compensatory mitigation for streams and wetlands. Wetland area and stream lengths can be calculated using GIS tools.

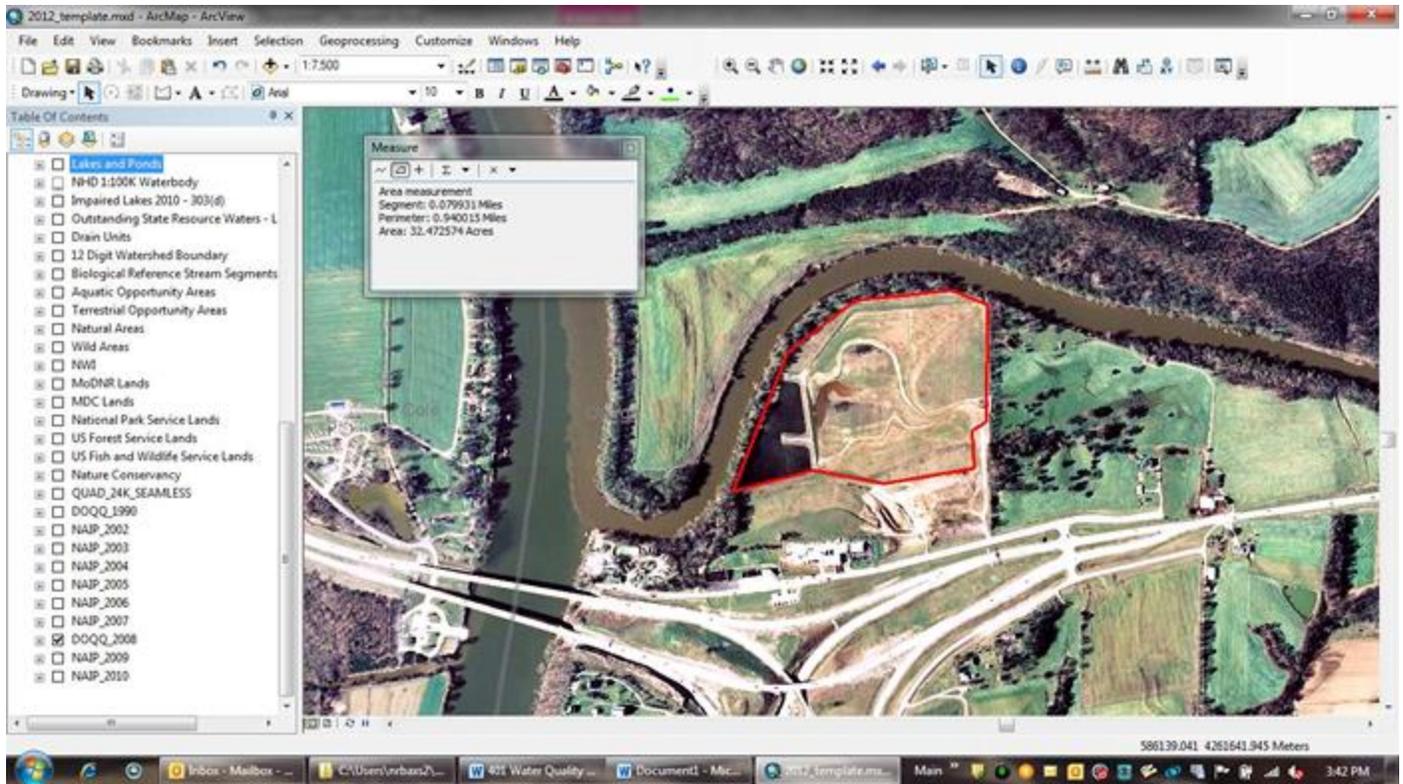


Figure 3 illustrates with the red polygon the area which is considered a wetland area. Using the Measure Tool, one can calculate the area within a polygon or length of a line (32.5 acres in this example). These calculations are needed when determining environmental impacts, calculating appropriate wetland or stream compensatory mitigation, and verifying completed work.

After a mitigation bank or site has been approved and constructed, they can be added to a GIS layer showing the distribution across the state. This has not been updated recently and staff plans to do so in the future.

In the future, staff hopes to improve the 401 Certification Database. Currently this is a web-based application that contains basic description and tracking information. A potential enhancement could link the database to a geodatabase where impact and mitigation areas are delineated and stored. The purpose would be to better track and enforce project approved through the 401 certification process.

Currently staff uses National Wetland Inventory (NWI) data to identify potential wetland areas. However, this data was created approximately 30 years ago. Missouri land use has changed significantly in some areas and the data is no longer accurate as we would like. An update to this statewide layer would be beneficial for 401 certification review in the future.

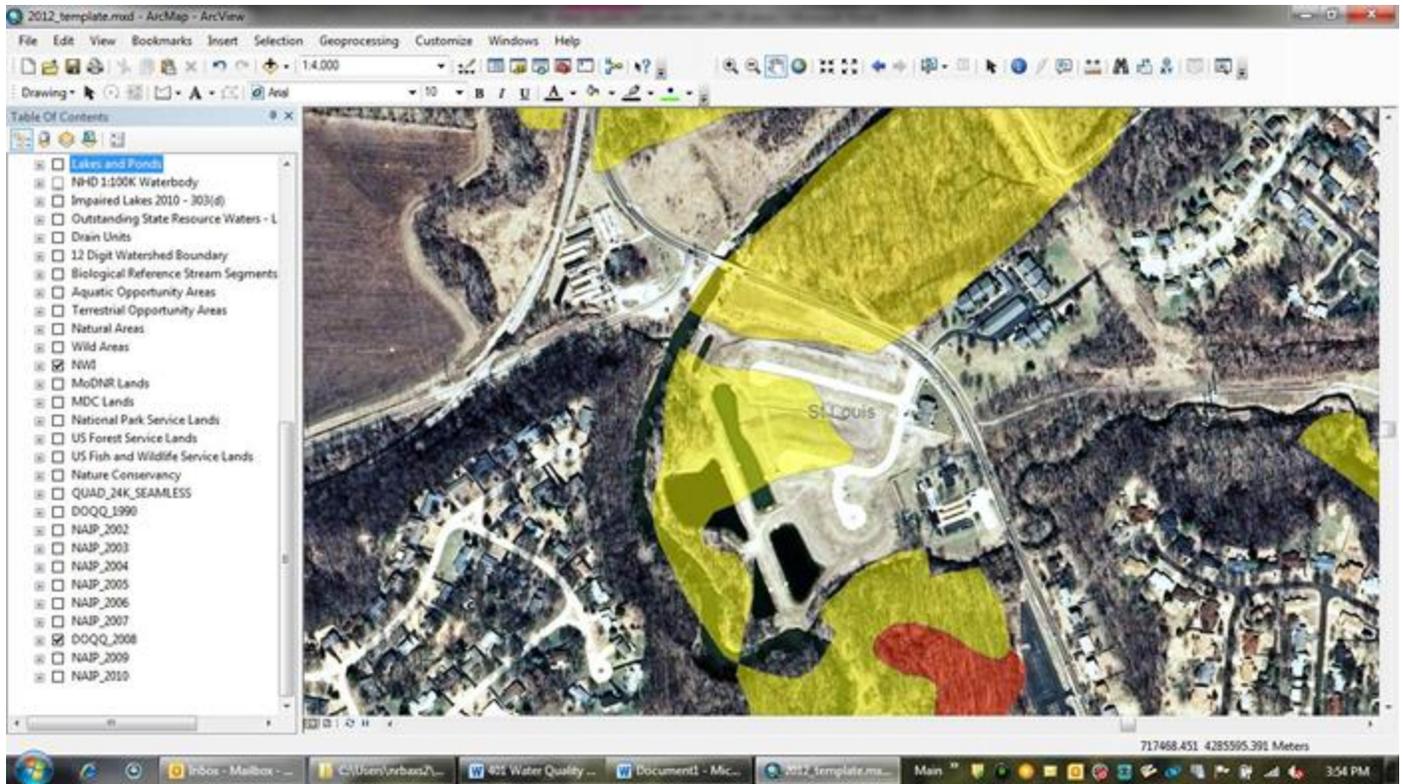


Figure 4 shows both digital imagery and NWI data. The yellow and red areas indicate different types of wetlands and the extent of those types within the area. As one can see, development is currently located on an area that is coded as a potential wetland. This illustrates how the NWI data can quickly become inaccurate, especially over a 30+ year period of time.

The Missouri Department of Natural Resources [Section 401 Certification webpage](#)

Staff Contact Information

Water Protection Program, Operating Permits Section
 401 Water Quality Certifications
 Phone: 800-361-4827 or 573-751-1300
 FAX: 573.522.9920
 Email: wpsc401cert@dnr.mo.gov

Other Useful Web Links:

Missouri's definitions for Classified Waters within their Water Quality Standards can be found in 10 CSR 20.7.031(1)(F).

Missouri's general **Water Quality Standards** can be found in 10 CSR 20-7.031(3).

Numeric Water Quality Standards in Missouri can be found in **10 CSR 20-7.031(4)**

List of Missouri waters with inorganic sediment, aquatic habitat alteration or unknown impairments
Information on mitigation requirements

Element 4 - Watershed Management

The ***Watershed Based Management Framework (2012 draft)*** and, ***Watershed Based Management Appendices***, provide the overall guidance for establishing watershed management processes in Missouri and, at the same time, provide the opportunity to streamline and coordinate Water Protection Program resource efforts towards the development of management plans for each

watershed. Such plans are designed to work together with the Soil and Water Conservation Program incentives.

Water protection and modernization is based on specific areas in an effort to modernize and streamline water protection activities. This long-term project includes four large-scale components as follows, an updated Water Protection Fee Structure which has been codified into state regulation in 2014, permit centralization, compliance assistance and watershed-based management development continues for the three pilot projects currently under development.

The department's watershed development strategy is based on a phased in approach to watershed management involving public agencies, businesses and environmental interests, groups and individuals, and forums in the current pilot projects for watershed management, namely, the Lower Grand Watershed, the Big River Watershed and the Spring River Watershed as described at dnr.mo.gov/omwi. These pilots were selected to provide a model for future watershed project developments. Coordinating our WPP water quality monitoring and assessment, permitting, planning and modeling activities on a defined watershed scale, provides the best path forward.

One of several appendices attached to the framework document is, see **Appendix B** the *Our Missouri Water's Initiative*. This initiative provides a holistic approach to management of Missouri's aquatic resources and, is changing the way the department conducts aquatic resource management.

One major priority of the Department is to transition all Missouri water resources to a watershed based management approach. This approach involves coordination and collaboration between programs and divisions within the department, other state, federal and local governments agencies and, many stakeholders. Regional Office staff are involved in monitoring, compliance assistance, and in planning and coordinating between many on-going regional interests.

Grouping of Watershed and Permitting

The grouping of watersheds into a five-year rotating cycle allows for permit synchronization as well as the coordination of the other Watershed Protection activities, including watershed planning, assessment, TMDLs, water quality monitoring and funding opportunities. Each cycle begins again after the fifth year, creating a continuous and predictable cycle of activities that will lay the groundwork for a more consistent and goal-oriented program. To accomplish this long-term operation, the WPP will be required to coordinate all statewide watershed activities over a five-year timeframe, where detailed plans and quality assurance project plan (QAPPs) are developed annually to meet the five-year planning objective.

The watershed based approach involves coordination and collaboration between programs and divisions within the department, other state, federal, and local government agencies and many participants from the public and private sectors.

Transitioning to Watershed Based Management - Permit Synchronization and Inspections

Permits are issued for a 5-year term. To achieve synchronization, many permits will need to be issued for less than the full five years allowed under current regulation. Much of the workload increase will be offset with the move of smaller facilities to general permit coverage.

The activities of many of the department's Water Protection Program sections will easily fit into the watershed management cycle. Other activities may not fit into the watershed management cycle when they must adhere to their own cycle or, because they are conducted on an as needed basis or as issues arise.

Missouri Clean Water Information System - MoCWIS

The recent completion of the Missouri Clean Water Information System (MoCWIS) database significantly improved the department's NPDES permit tracking and the Water Quality Data System (WQDS) database. MoCWIS 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 department to maintain Water Quality Standards and to manage wastewater permit application and NPDES permit data, as well as water pollution inspections and enforcement.

Public Involvement

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.

The current pilot projects selected for watershed management will help to develop an effective website for future general public involvement.

Element 4 – Web-based GIS Services

Links to <http://dnr.mo.gov/edata.htm>

Element 5 - Strategic Planning for Future Development

Strategic Summary

The Missouri Clean Water Commission is designated as a water contaminant control agency for the state under Section 644.021 RSMo. Statewide water quality management issues are resolved as a result of the extensive work of the commission and the department, in turn supported by grants, planning, and the wide-ranging work of many committees and communities.

State authorization for water pollution control programs is found in the policy statement in the Missouri Clean Water Law, Section 644.011 RSMo (Missouri Revised Statutes). This authorization provides the planning and implementation authority for water quality management required under the Federal Clean Water Act. Part of the commission's authority is to develop comprehensive plans and programs for the prevention, control and abatement of new or existing pollution of waters of the state. The Missouri Department of Natural Resources is the designated state agency committed to continuing planning processes for water pollution control programs.

The department collaborates with many agencies. Various activities are described here that demonstrate the department's commitment to intergovernmental efforts with local communities, associations, and various government and environmental interests supported by the citizens involved in watershed work on the community level. Here are just a few recent or recurring examples of the multi-faceted activities requiring intergovernmental cooperation that will support the Water Protection Program's overall planning efforts and a healthy economy.

Department Community Services Initiative – Fiscal year 2015

The department is proceeding with its implementation of our community services project. As the Our Missouri Waters initiative continues, it focus on specific watersheds, Community Services will be extending specific planning assistance to communities, not only within Our Missouri Waters watersheds, but to selected communities across the state. The department's Community Services Coordinator will lead in the coordination of the various aspects of these efforts and resolves issues that may arise.

Community Services will focus attention on a number of communities whose wastewater compliance requirements pose a high economic burden on the community. Communities throughout the state

have been contacted by the department to discuss the challenges they are facing. These communities will be the first communities the department will talk with concerning Community Services assistance.

Regional staff will be participating in the following tasks to implement community services efforts. A community assessment is being planned to collect and refine information related to communities with a population of 500 to 5000, in selected watersheds or, as individual communities identified as needing attention. Once communities are contacted, actions to address community needs may be taken in the form of direct assistance in completing grant applications with the city clerk or in setting up services that address community needs. Small communities will be identified within each watershed through Our Missouri Waters, those communities planning wastewater systems upgrades that are burdened with higher affordability ratings.

There are several steps in the process when creating an implementation plan - meeting with partners to discuss community outreach efforts, informing all potentially interested partners, identifying informational needs, defining best available options for support, and the follow-up with community leaders to confirm the options and the necessary steps in a workable implementation plan.

Engineering Evaluations / Community Assistance

Engineers in the department's regional offices plan to conduct engineering evaluations of wastewater treatment facilities. These evaluations will be done as part of a compliance inspection and it are intended to provide a more in-depth evaluation by providing engineering insight regarding potential causes for current issues and future needs. The engineering assessment will involve the review of engineering designs, an evaluation of the hydraulic loading (actual average flows vs. design), a review of the age of the infrastructure and its design life, a review of the service population and economics, an assessment of the plant's treatment performance, an examination of the community's inflow and infiltration issues, and a discussion of future regulatory issues. Not all areas will be evaluated with each review. Staff worked to develop a template by which these evaluations will be made so that these are being conducted in a consistent manner. This will largely be a regional office initiative and is intended to provide cities with information and assistance.

Water Quality Coordinating Committee

The **Water Quality Coordinating Committee** is an informal interagency and public committee dealing with water quality issues. Representatives of nonprofit organizations, universities and colleges, cities and businesses, as well as state, federal and local agencies, regularly attend committee meetings. Committee participants may also assist in the coordination and implementation of watershed protection strategies.

Resource Grants for Communities

The Water Protection Program components under the Clean Water Act Section 604(b) federal grant, are intended to assist with the revision of Water Quality Standards, risk-based groundwater standards, the anti-degradation policy and implementation method, toxicity testing, area-wide wastewater management prioritization, including planning studies and, wastewater feasibility studies. A portion of the 604(b) federal grant is awarded to Missouri communities for water quality planning.

Communities are invited to submit their competitive project proposals through their Regional Planning Commissions and the Missouri Councils of Governments for funding. The emphasis has been on projects that support community or ecosystem based environmental protection, for example watershed protection initiatives.

Financial Assistance Center - Intergovernmental Cooperation

Funding Clean Water Infrastructure through EIARA Bonds

The Missouri Clean Water Commission, the Department of Natural Resources and the Environmental Improvement and Energy Resources Authority (EI ERA) are cooperating to maximize the amount of construction that can be supported by the Clean Water State Revolving Fund. The fund provides low-interest loans for construction projects. As the loans are repaid, the money is loaned again.

Through the combined efforts of these agencies, Missouri can be expected to achieve approximately \$1.43 of construction for each \$1 of available EPA and state matching funds, at this point in time. This cooperative program to increase the amount of construction is referred to as the State Revolving Fund Cash Flow Model Loan Program. Because Missouri's construction projects funding needs greatly exceed the available funds, the department continues to work with the SRF finance team to refine the program's structure.

A recent example of cooperation and enhancement of the current program structure is the department's decision to utilize the ability of EI ERA to sell bonds, the proceeds of which would supplement projected annual funding levels. The size of the sale would be based on current Clean Water SRF loan repayment schedules and projected new loans. A bond sale of \$130 million is anticipated in the near future. Additional future bond sales will occur as the construction needs and the financial support allow.

This cooperative approach will meet a portion of the additional funding needs. The department will continue to evaluate possible future program structures to ensure the program provides a stable source of funding for clean water infrastructure projects well into the future.

Nonpoint Source (NPS) Management Planning

Revisions to the Statewide Nonpoint Source Management Plan have been open recently for public comment. A new five-year plan will serve as Missouri's guiding document for nonpoint source water pollution remediation and protection and reflects the department's commitment to the Our Missouri Waters Initiative. EPA must approve the plan for Missouri funds in support of the Clean Water Act 319 NPS program efforts.

Clean Water Act Section 319 NPS grant funds are used for programs and projects for nonpoint source management planning as well as the implementation of the Missouri Nonpoint Source Management Plan (NPSMP). These funds are limited to a competitive bid process used to ensure that the most appropriate projects are selected for funding. Grant funds must be used in a manner consistent with the **Missouri Nonpoint Source Management Plan**.

Federal, state and local agencies, nonprofit and environmental groups, and business and industry are consulted throughout the planning process. Representatives from several agencies and organizations are invited to participate in the management plan workgroup to develop strategy and suggest planning components, review drafts and comments and contribute information on their nonpoint source related goals. Public involvement is provided through the public notice and comment process through press releases and the department's website.

Nonpoint source water pollution sources are discreet and often difficult to pinpoint. Nonpoint source pollution is addressed through the state's Nonpoint Source Management Program, which is funded by the Environmental Protection Agency to coordinate, educate, monitor, assess, plan and help implement management practices to restore and protect waters. As section 319 program funding is relatively small it is important to make effective use of the 319 grant funds. The program brings many interested agencies, counties, cities, industry and conservation interested parties and volunteers together to leverage funds and lower costs to any one entity.

Keys to success include program outreach and education through partnership. No single organization has the means to restore and protect all of Missouri's waters without assistance from reliable and committed partners.

Another key to success is effective use of available funds for activities that restore and protect streams and lakes on a watershed scale. The NPSMP prioritizes actions based on the water quality effort and relative to the Our Missouri Waters Initiative as well as the Clean Water Act guidance for 319 nonpoint source programs. As priorities are established, education and partnerships will be as critical to successful outcomes as will water quality monitoring, and the identification of water contaminants, sources, and the degree of impairment.

The public and the private sector will be crucial to the development and use of appropriate best management practices in both urban and rural areas. Through the Our Missouri Waters active initiative and continued NPSM implementation, water quality planning may be enhanced through cooperative non-regulatory efforts.

Water Quality Standards Development

States are authorized under the Clean Water Act to develop water quality standards and implementation plans to carry out federal requirements. The Missouri Clean Water Law gives the Clean Water Commission authority to develop water quality standards, one of the foundations of the commission's efforts in the development of the state's water quality for its streams, rivers, lakes and wetlands.

The triennial review of Missouri's water quality standards is both a public and stakeholder driven process that reflects the interests and goals Missourians have for their waters. Input from the public and stakeholders on the content, as well as the environmental and economic benefits and costs, of a rulemaking ensure that Missouri's water quality standards rule reflects the latest science, studies and interest of the public and interested stakeholders.

Water quality data received from the Water Protection Program's monitoring system, other agencies, or through special studies and volunteer monitors is used to compare the quality of streams, rivers and lakes to the state's standards. The department's **Environmental Services Program** assists with the collection and analysis of water and biological samples. The results of the monitoring efforts are updated every two years and published in the Missouri Water Quality Report to Congress, as referred to as the 305(b) report required under the Clean Water Act.

The development of **standards and assessments** are required under federal law. Waters that fail to meet standards are listed on Missouri's 303(d) list for impaired waters (required under Section 303(d) of the Clean Water Act) and are targeted for studies and corrective actions to return them to compliance.

Intergovernmental Cooperation in Water Quality Monitoring and Analysis

The department currently maintains an annual contract with the U.S. Geological Survey (USGS) to monitor water quality. Contracts with USGS produce testing reliability of the E.coli analytical methods, the analysis of the nutrient database to assist with the development of nutrient criteria for streams, writing summary reports on data results from the ambient network, and/or watershed level studies.

The department also has several cooperative ventures with the Missouri Department of Conservation (MDC). One is the development and administration of the volunteer water quality monitoring program for training and equipping volunteers and development and operation of a new on-line data base for data submitted by volunteers. The department and MDC also cooperate annually on site selection and sample collection of fish tissue for contaminant analysis. Samples collected by the department are analyzed by the U.S. Environmental Protection Agency (EPA).

The department has recently coordinated with the NRCS on the Mississippi River Basin Initiative (MRBI) on the location of monitoring sites for that federal program. The department is also currently participating in the Upper Mississippi River Basin Association (UMRBA) project to develop a water quality monitoring strategy for the portion of the river upstream of the Ohio River, and participates in

an intergovernmental work group to look at databases and monitoring activities on the Lower Mississippi River.

The department has assumed stewardship of the USGS National Hydrography Database for Missouri. This means that while USGS maintains ownership of the database, the department has been given the authority to edit the database to correct errors.

Cooperative water quality monitoring projects, with governmental or non-governmental entities, funded through the Clean Water Act, must have a Quality Assurance Project Plan (QAPP) approved by the department. This signed document is an agreement by all involved parties on how the monitoring will be done and the responsibilities of each organization.

The National Water Quality Initiative (NWQI) is being jointly undertaken by the USDA Natural Resources Conservation Service (NRCS), the Environmental Protection Agency (EPA), and State agencies with non-point source responsibilities for the 319 NPS program, as well as water quality responsibilities. Two monitoring components are therefore introduced: NWQI in-stream monitoring and NRCS edge-of-field monitoring. NRCS will provide information to support in-stream monitoring; fund edge of field monitoring in select watersheds and, track progress. EPA will coordinate and support in-stream monitoring and track progress. State 319 NPS water quality agencies will conduct focused in-stream monitoring in one NWQI watershed and may do optional monitoring, and/or track progress elsewhere. There will be different levels of activity among NWQI watersheds. Joint EPA, department, and, NRCS water quality monitoring efforts and data sharing, will result from the NWQI's selected watersheds, will work together to identify and quantify effective management practices in the field and, the overall impact on receiving streams.

Missouri Nutrient Reduction Strategy

The Missouri Nutrient Reduction Strategy Committee, <http://www.dnr.mo.gov/env/wpp/mnrsc/index.htm>, originated in 2011, at a time when the Environmental Protection Agency made grants to states under the Clean Water Act, Section 104(b)(3) for the Mississippi River Basin to develop and implement nutrient reduction strategies. EPA requested each group that received a grant to come up with a 45 percent reduction. The strategy itself is a response to the 2008 Gulf Hypoxia Action Plan that established a goal for reducing the loss of nitrogen and phosphorus to the Gulf of Mexico.

The committee has reviewed the most reliable scientific data available to help guide the strategic planning process. Data from the USGS, USDA, NRCS and the Missouri Department of Natural Resources provided the basis for determining past and current loadings and for framing discussions at the watershed level. Experts from agricultural, industrial and water quality groups worked together in the development of the strategy. Past successes on nutrient-related issues were used to guide development of individual actions, while additional actions were included for development and implementation over the first five years of implementation.

The strategic goal is to create an accessible document by the end of 2014, one that contains the current state of knowledge on nutrient loading in Missouri as well as the recommended actions for reducing nutrient loads. Missouri's vision to guide the development and implementation of this strategy is quite simple. "All Missouri waters have acceptable levels of nutrients that maintain water quality for all designated uses."

Joe Engeln, Missouri Department of Natural Resources, lead the strategy development meetings. Other participants include:

- Todd Blanc Missouri Department of Natural Resources
- Alan Freeman Missouri Department of Natural Resources
- Chris Klenklen Missouri Department of Agriculture
- Colleen Meredith Missouri Department of Natural Resources

- Cory Lindeman University of Missouri – Extension
- Darrick Steen Barr Engineering, Inc./Missouri Corn Growers Association
- David Carani Geosyntec, Inc
- Doris Bender City of Independence
- Gopala Borchelt Table Rock Lake Water Quality, Inc.
- Graham Freeman Missouri Department of Natural Resources
- Jim Gaughan Missouri Department of Health and Senior Services
- Joe Engeln Missouri Department of Natural Resources
- John Lodderhose St. Louis Municipal Sewer District
- John Lory University of Missouri
- Joseph Slater University of Missouri - Fertilizer/Ag Lime Control Services
- Judy Grundler Missouri Department of Agriculture
- Kat Logan Smith Missouri Coalition for the Environment
- Kurt Boeckmann Missouri Department of Natural Resources
- Ken Struempf Missouri Department of Natural Resources
- Lorin Crandall Missouri Coalition for the Environment
- Nora Estopare St. Louis Municipal Sewer District
- Peter Scharf University of Missouri
- Robert Brundage North Central Regional Planning Commission
- Steve Walker Missouri Department of Natural Resources
- USDA-NATURAL RESOURCES CONSERVATION SERVICE: Glen Davis, Steve Hefner;
- USDA-AGRICULTURAL RESEARCH SERVICE: Claire Baffaut;
- UNIVERSITY OF MISSOURI EXTENSION: Bob Broz
- MISSOURI FARM BUREAU: Leslie Holloway;

Protecting Urban Streams and Rivers through the Integration of Green Infrastructure and Stormwater Management

By mimicking the natural cleansing of nature, green infrastructure can address the full range of urban pollutants. Green infrastructure serves to protect healthy forests, lands and streams that naturally sustain clean water supplies; restores degraded landscapes like floodplains and wetlands so they can better store flood water and recharge streams and aquifers; and, importantly, replicates natural water systems in urban settings by preventing stormwater and sewage pollution.

Green Infrastructure through Municipal Separate Storm Sewer System Permits

The department serves as permitting authority for the National Pollutant Discharge Elimination System (NPDES) program under the Environmental Protection Agency and the Clean Water Act. The department operates under authority of Missouri's Clean Water Law and Clean Water Commission.

An estimated 164 Municipal Separate Storm Sewer Systems (MS4s) in Missouri are regulated under the NPDES program and as such are required to implement stormwater management programs to protect water quality. One requirement is for the municipality to regulate new and redevelopment projects in a manner that protects water quality to the maximum extent practicable. Requirements generally affect projects that disturb an acre or more of land.

Green infrastructure is designed to take advantage of the existing natural systems and mimic their function during project site design and installation. Consideration is given to retaining and protecting our natural systems such as wet weather streams and wetlands. Protection measures might include vegetated stream buffers and narrower roads to retain natural topography and native plant species. Enhancements on a new development site might include a stormwater treatment train of smaller practices such as rain gardens, bioswales, stormwater wetlands, wet ponds, dry ponds, green roofs or pervious pavements.

As indicated in contemporary trends and technology, sustainable stormwater management can be approached through best site designs and on-site practices that serve to slow, spread and soak the “first flush” of small precipitation events. Sustainable stormwater management is a major shift from conventional stormwater management and is often referred to as low impact development or green infrastructure.

In some cases, green infrastructure is employed to help restore impacted stream systems through Total Maximum Daily Load (TMDL) implementation plans and overflow reduction plans for combined or separate sanitary sewer systems.

Green Infrastructure in Total Maximum Daily Load (TMDL) Implementation Plans

In some TMDL planning impacted stream systems may be restored through retrofits of the existing stormwater drainage system. Retrofits might include downspout disconnection practices that direct rooftop runoff through rain barrels to rain gardens. Parking lots might be retrofitted to include vegetated islands that intercept and treat runoff, and to include pervious pavement or structural grid systems that can be vegetated yet support overflow parking and emergency access areas.

Green Infrastructure in Combined Sewer Overflows (CSO) and Sanitary Sewer Overflow (SSO) Reduction Plans

Communities are voluntarily including green infrastructure in long-term CSO and SSO reduction plans. Also, some of the department’s enforcement agreements may include requirements for green infrastructure as one means to mitigate CSOs and SSOs. The integration of green infrastructure into gray infrastructure systems can help to eliminate certain stormwater connections and reduce overall stormwater volume loads to the systems. This can be accomplished through the implementation of small dispersed stormwater control measures that serve to slow, spread and soak stormwater through infiltration, evapotranspiration and reuse.

Similarly, **NRDC** espouses Green Strategies for Controlling Stormwater and Combined Sewer Overflows

Emerging Considerations for Green Infrastructure in Climate Change Adaptation Strategies and Flood Prevention

The department follows emerging trends with green infrastructure, and one such trend is a focus on potential increases in stormwater runoff countered by extended periods of drought, all related to climate change as indicated by National Oceanic and Atmospheric Administration, NOAA. NOAA indicates green infrastructure concepts and practices, investing in nature to minimize climate risks, play a critical role in making coastal communities more resilient to natural hazards, <http://www.csc.noaa.gov/digitalcoast/training/green>

As indicated in numerous articles and climate change adaptation plans around the world, green infrastructure in stormwater management is no longer an innovative option, but rather necessary economic and environmental stormwater best practices. Benefits outweigh costs. Incorporating green infrastructure into gray infrastructure systems minimizes impact, reduces risks and those costs expected to recur as a result of the environmental impacts of climate change.

Green infrastructure mitigates flood risks by slowing and reducing stormwater discharge, building safer communities. Damage from flooding, including lives lost and property damage, is one of the most expensive causes of natural disaster. Green infrastructure is a mitigation expenditure undertaken before the disaster occurs.

Existing stormwater management systems, designed to control runoff and protect property when it rains, may no longer function as intended. The infrastructure in these systems may prove inadequate, resulting in increased flooding, damage to property, public safety concerns, and impacts to the quality of our lakes, streams and wetlands. Climate change factors are currently being used to

determine the design flood for the areas of river catchments. One study assessed the “pipeshed” capacity of existing systems. An upgrade of \$56,000 today could have been done for \$38,000 earlier and could have helped avoid FEMA buyouts. Consideration was given to the cost to upgrade undersized culverts, for example, in the Oyster River Watershed, NH (2008). If all under-capacity culverts were replaced in a single year, funded by a one-time special levy, the current tax rate would increase from \$26.76 to \$ 27.18 per \$1,000 assessed value – about \$125 on a \$300k house. In this example, cost of inaction is significant.

Changes to hydrology such as increased surface runoff of rainwater, when they occur, present risks and uncertainties, and costs. Future adaptation measures as a result of changes in hydrology should be factored into watershed management plans and cost considerations, reducing risks and therefore costs.

For further information relative to green infrastructure consider the following –

- **Banking on Green – ASLA**
- **The Value of Green Infrastructure – CNT/AR**
- **Adverse Impact: Preserving Our Watersheds- Protecting Our Property Rights – AfSMA**
- **Minnehaha Creek Watershed Stormwater Adaptation Study**

Disposal of Wastewater in Residential Housing Development

The Department of Natural Resources has had a residential housing development rule since 1974 with the current regulation effective March 30, 1999. The current residential housing development regulation is based upon a check and balance of our knowledge of the soil/landscape model and its ability to treat and control the effluent with subsurface soil dispersal (absorption) systems. The rule addresses individual onsite wastewater treatment (septic) systems, cluster systems or any combination thereof. The purpose of the rule is to determine the method of wastewater treatment and allows the developers the ability to determine it during the early planning.

The current residential housing rule is being amended not only to follow the EPA Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems but to ensure it continues to work with the Department of Health and Senior Services standards for decentralized individual or cluster systems under their jurisdiction.

Residential Housing Development and Liquid-Waste Treatment

Residential Housing evaluation reports consist of descriptions of geologic and hydrologic conditions and project-specific information. Proposed residential housing development reports determine a minimum lot size for the use of standard septic systems with specified water-supply sources. Other proposed liquid-waste treatment site reports provide limitations ratings for the specific treatment system planned. For some proposed or existing facilities, GSP also assists with planning and devaluating groundwater monitoring systems. The Geological Survey Program reports are provided to the Water Pollution Control Branch and the regional office to be used for permit writings

Missouri Geological Survey

The **Missouri Geological Survey**, a division of the Department of Natural Resources, provides geologic evaluations that classify streams as either gaining or losing flow and provides technical evaluations on the suitability of sites for various wastewater treatment alternatives, including subdivisions using septic tanks, wastewater treatment or holding ponds, discharges to streams, land-application plots, and subsurface soil absorption fields. The potential for catastrophic collapse due to sinkhole development or mine collapse is also evaluated for earthen holding ponds.

The Missouri Geological Survey engages in various support activities with the Water Protection Program on enforcement cases, such as groundwater tracing and special contaminant-source

investigations, providing evaluations with regard to wastewater streams from industrial, business and agricultural sources as well.

The Missouri Geological Survey provides technical assistance to the water program on geologic and hydrologic issues related to impaired waters of the state. This assistance is expected to include various tasks related to Total Maximum Daily Load development and may include other activities. The Water Protection Program and the department's Water Resources Program use similar sources of low-flow survey data including the U.S. Geological Survey. The Water Protection Program reviews flow data from all possible sources and if necessary requests additional flow monitoring.

Element 6 - Strategic Planning for Future Development

Strategic Summary

In accordance with Section 303(c)(1) of the federal Clean Water Act, the Missouri Department of Natural Resources will initiate at least once every three years a review of Missouri's Water Quality Standards regulation at 10 CSR 20-7.031. These reviews will evaluate the need to update or revise state standards in order to remain consistent with state and federal law. The review will also ensure Missouri's water quality standards continue to reflect the best available science and support sound water quality management policies that improve and protect the unique and diverse water resources of the state.

During each triennial review the department will solicit comments from interested parties and members of the public on any aspect of the Water Quality Standards regulations. At a minimum, the department will consider revisions to those standards disapproved by EPA.

The department will also consider any newly recommended federal water quality criteria that have been established under Section 304(a) of the federal Clean Water Act. The department also foresees additional water quality standards development in the area of tiered aquatic life use designations, regional water quality criteria (including numeric nutrient criteria for lakes and streams), wetland classifications and criteria development, use attainability analyses and site-specific criteria developed by the department or interested parties.

- Proposed changes to 10 CSR 20-7.031 will take place through the regulatory adoption process as provided by Sections 536.016, 640.015, and 644.026 Missouri Revised Statutes. Prior to adoption, notice will be published and a public hearing will be held to receive formal comments on the proposed revisions. Final action to adopt any revisions to the water quality standards will be conducted by the Missouri Clean Water Commission.

Periodic review and revisions of Missouri's water quality standards provides both environmental and economic benefits to the state, the regulated community and the general public. Revisions intended to refine designated uses, water quality criteria and other Clean Water Act requirements provides more realistic and science-based water quality goals that recognize and protect the wide-diversity of aquatic habitat and uses found in Missouri's waters. This translates into regulatory compliance costs and, resulting environmental benefits, at the level required for a given habitat and the biota that reside there.

The department's Water Pollution Control Branch will focus in upcoming years on establishing schedules of compliance in permits for water quality based requirements where appropriate, consistent with the Water Protection Program's schedule of compliance document. Permits will continue to include affordability information regarding publicly owned treatment works when new requirements are included in the permit. This affordability information will be used to substantiate portions of the timeframe allowed via the schedule of compliance. Affordability findings will continue to evolve as better information regarding the cost of treatment technologies and consumer rates are developed.

As permits are synchronized on an eight digit HUC level, the department will act on those opportunities that will allow individual permit schedules of compliance for water quality requirements that are consistent across the watershed. Watershed wide water quality improvements will result in quantifiable benefits to water.

Element 6 - Overview

Missouri's Water Quality Standards provide the basis for the department's Water Protection Program. Water quality standards consist of three components: designated beneficial uses, water quality criteria, and an antidegradation policy. As required by the Clean Water Act, the department reviews and modifies the water quality standards ever three years. Termed the triennial review process, the department evaluates the effectiveness of the standards and proposes new or revised standards accordingly.

Additional information regarding Missouri's water quality standards are online at **the department's website**. Proposed changes to Missouri's water quality standards can be found on the department's **Rules in Development web page**

Designated Uses:

Designated beneficial uses are the uses for a water body identified in the state water quality standards that must be maintained in accordance with the federal Clean Water Act.

As a goal, the department, through a stakeholder process, will designate Clean Water Act Section 101(a) presumed uses to additional waters of the U.S. The department will review comments received from the public indicating existing uses and propose appropriate designated use changes as part of the triennial review process.

As a goal, the department will evaluate its current aquatic life use designations and consider the appropriateness of these uses and options for moving towards a tiered aquatic life structure.

The department will review use attainability analyses submitted to it and determine the appropriateness of any use changes.

As a goal, the department, through a stakeholder process, will develop an aquatic life use attainability analysis protocol.

Water Quality Criteria:

Water quality criteria are limits on particular chemicals or conditions in a water body to protect particular designated beneficial uses. Water quality criteria can be expressed as specific numeric criteria or as general narrative statements.

The department will, as part of its triennial review, evaluate the appropriateness of its water quality criteria for protecting its designated uses.

As a goal, the department will develop nutrient criteria for the protection of aquatic life in classified streams and lakes. More information regarding the state's development of nutrient criteria can be found at

The department will review data submitted to it and evaluate the appropriateness for site-specific criteria.

As part of the triennial review, the department will review EPA 304(a) recommended criteria and adopt these criteria or propose its own criteria when appropriate.

As a goal, should the department adopt a tiered aquatic life scheme, the department will develop appropriate aquatic life protections consistent with these uses.

Anti-degradation:

Missouri's Water Quality Standards include the EPA "three-tiered" approach to antidegradation, and may be found at 10 CSR 20-7.031(2).

Tier 1 – Protects existing uses and a level of water quality necessary to maintain and protect those uses. Tier I provides the absolute floor of water quality for all waters of the United States. Existing instream water uses are those uses that were attained on or after Nov. 28, 1975, the date of EPA's first Water Quality Standards Regulation.

Tier 2 – Protects and maintains the existing level of water quality where it is better than applicable water quality criteria. Before water quality in Tier 2 waters can be lowered, there must be an antidegradation review consisting of: (1) a finding that it is necessary to accommodate important economic and social development in the area where the waters are located; (2) full satisfaction of all intergovernmental coordination and public participation provisions; and (3) assurance that the highest statutory and regulatory requirements for point sources and best management practices for nonpoint sources are achieved. Furthermore, water quality may not be lowered to less than the level necessary to fully protect the "fishable/swimmable" uses and other existing uses.

Tier 3 – Protects the quality of outstanding national and state resource waters, such as waters of national and state parks, wildlife refuges and waters of exceptional recreational or ecological significance. There may be no new or increased discharges to these waters and no new or increased discharges to tributaries of these waters that would result in lower water quality.

More information regarding to Missouri's anti-degradation policy can be found on the department's [antidegradation web pages](#).

Element 6 - Antidegradation

Missouri's Water Quality Standards include the EPA "three-tiered" approach to antidegradation, which may be found at **10 CSR 20-7.03(2)** .

Tier 1 - Protects existing uses and a level of water quality necessary to maintain and protect those uses. Tier 1 provides the absolute floor of water quality for all waters of the United States. Existing instream water uses are those uses that were attained on or after Nov. 28, 1975, the date of EPA's first Water Quality Standards Regulation.

Tier 2 - Protects and maintains the existing level of water quality where it is better than applicable water quality criteria.
Before water quality in Tier 2 waters can be lowered, there must be an antidegradation review consisting of: (1), a finding that it is necessary to accommodate important economic and social development in the area where the waters are located; (2), full satisfaction of all intergovernmental coordination and public participation provisions; and (3), assurance that the highest statutory and regulatory requirements for point sources and best management practices for nonpoint sources are achieved. Furthermore, water quality may not be lowered to less than the level necessary to fully protect the "fishable/swimmable" uses and other existing uses.

Tier 3 - Protects the quality of outstanding national and state resource waters, such as waters of national and state parks, wildlife refuges and waters of exceptional recreational or ecological significance. There may be no new or increased discharges to these waters and no new or increased discharges to tributaries of these waters that would result in lower water quality.

More information regarding Missouri's antidegradation rule, including the implementation of this rule, can be found on the Water Protection Program [web pages](#).

Element 6 - Designated Use

Designated uses are the uses for a water body, identified in the state Water Quality Standards, that must be maintained in accordance with the federal Clean Water Act. Designated uses, including Clean Water Act Section 101 (a) presumed "fishable/swimmable" uses, are assigned to all classified water bodies in the state. It is the department's goal, through a stakeholder process, to expand the designation of these presumed uses to include all waters of the U.S. that lie within the state. It is also the department's goal to use a stakeholder process to evaluate the appropriateness of its current aquatic life use designations and consider options for moving towards a tiered aquatic life use designation.

Federal regulations require that a Use Attainability Analysis (UAA) be conducted where a state designates uses for a water body that do not include the Clean Water Act Section 101 "fishable/swimmable" uses, when the state wishes to remove these uses, or when the state adopts subcategories of such uses that require less stringent criteria. In a UAA, the physical, chemical, biological and economic factors affecting the attainment of a use are evaluated through a water body survey and assessment process. The department will review UAAs during the triennial review period to determine the appropriateness of any use changes. The department will also review comments and data received from the public supporting existing use designations, and will propose appropriate use changes as part of the triennial review process.

Element 6 - Public Participation

Through the use of the department's Water Protection Forum, the department will involve stakeholders in the development of its water quality standards. Additionally, because Missouri's water quality standards are contained in the state's Code of State Regulations, the Secretary of State's administrative rules provide specific procedures for promulgating, rescinding, and amending the water quality standards. Such procedures include a public comment period and a public hearing. Public involvement will also be facilitated through quarterly Clean Water Commission meetings, which are open to the public and streamed live to the internet.

Additional Information

Water Protection Forum

Missouri Clean Water Commission

Code of State Regulations

Rulemaking Manual

Element 6 - Water Quality Criteria

Water quality criteria are limits on particular chemicals or conditions in a waterbody to protect particular designated uses. Water quality criteria can be expressed as specific numeric criteria or as general narrative statements. The department will, as part of its triennial Water Quality Standards review process, evaluate the appropriateness of established water quality criteria for protecting designated uses. As part of this process the department will review EPA 304(a) recommended criteria and, when appropriate, either adopt these criteria or propose alternate criteria. The department will also consider proposals from third-party stakeholders for the establishment of site-specific criteria, and will review and evaluate these proposals and all supporting data for the appropriateness of establishing such criteria.

It is the department's goal, through a stakeholder process, to develop numeric nutrient criteria for the protection of aquatic life in classified streams and lakes. More information regarding the department's development of nutrient criteria can be found on the Water Protection Program website at [nutrient criteria web page](#). The department established a tiered aquatic habitat use framework on Feb. 28, 2014. This framework will be refined by the department in future rulemaking.

Element 7 - Strategic Planning for Future Development

Disposition of all Residual Waste

Over the next several years the department will continue efforts to develop its Missouri specific biosolids management program while maintaining good coordination with EPA's National biosolids program. Stakeholder meetings will be convened to discuss changes to the Missouri's standard permit condition part III as well as revisions to guidance documents **WQ 420 to WQ 449**. The department will continue to develop better ways to help CAFO permittees develop and implement nutrient management plans when required by their state operating permits. This will involve coordination with the University of Missouri Cooperative Extension and Missouri Natural Resources Conservation Service. This effort will be in conjunction with the Missouri Nutrient Reduction Strategic Plan, which is due to be finalized in 2014. Efforts are underway and will continue to assist CAFO facilities that wish to conduct methane capture. These efforts will address water quality impact as well as promote the renewable energy source.

Element 7 - Disposition of all Residual Wastes

Ensuring adequate controls over the disposition of all residual waste or sludge from any water treatment processing is authorized under state authority by adding sludge requirements to the state Water Pollution Control Operating Permit. Sludge is a residual of the wastewater treatment process, the byproduct of the industrial treatment process of raw wastewater and is the result of contaminants removed from the wastewater stream. Sludge that meets the requirements for land application is called biosolids. The Missouri Department of Natural Resources requires state operating permits for all persons who operate, use or maintain facilities for the storage, treatment or disposal of sludge and/or biosolids as well as construction permits for those who build such facilities for storage, treatment or disposal. The department administers a state biosolids program. The U.S. Environmental Protection Agency administers a separate national biosolids programs. Missouri is not delegated to administer this program.

Facilities must meet the applicable control technology for sewage sludge treatment, use, and disposal as published by EPA and, applicable state standards and limitations in the Missouri Clean Water Law.

The Missouri Department of Natural Resources and the University of Missouri Cooperative Extension Services have developed guidance documents **WQ 420 to WQ 449** for permittees designed to promote safe use and disposal of biosolids.

Missouri Biosolids Program

The Missouri Biosolids Program operates in conjunction with the delegated NPDES permit program for wastewater treatment facilities. A separate National Biosolids Program is administered by the EPA and has independent permitting and technical requirements under federal regulations. Missouri is delegated to administer NPDES permits, but is not delegated for the NPDES Biosolids Permitting Program. The state addresses any violations to water quality standards, while technical violations of federal regulations are referred to EPA. NPDES sludge permitting regulations are authorized under 40 CFR Part 122, Part 501, and Part 503. Requirements for states to assume delegation of the national program are authorized in 40 CFR Part 501. The Missouri Biosolids Program has been in place since 1982, preceding the first federal rules in 40 CFR Part 503 issued in 1993.

The Missouri Department of Natural Resources and the University of Missouri Extension Services have developed guidance documents designed to promote safe use and disposal of biosolids for permittees. Standard Conditions Part III in NPDES permits incorporates the University Extension water quality guidance documents. Other applicable state laws involving use and disposal of sewage sludge include the Missouri Fertilizer Law, administered by the Director of the Missouri Agricultural

Experiment Station, and the Solid Waste Management Law, administered by the Missouri Department of Natural Resources.

Construction Permits

A state construction permit is required by 10 CSR 20-6.015 for all persons who build, erect, alter or replace facilities for sludge or biosolids storage, treatment, and disposal from domestic wastewater facilities. Revisions to 10 CSR 20-6.010(4)(C) would exempt sludge processing equipment, if made in the near future. A fee based on the size of the facility is required by 10 CSR 20-6.011 for each construction permit application. Each application must include engineering plans, specifications and biosolids/sludge management plans. Plans must be developed according to state design regulations as published in 10 CSR 20-8.020.

Operating Permits

The Missouri Biosolids Program operates in conjunction with the delegated NPDES permit program for wastewater treatment facilities by adding sludge requirements into state operating permits. A state operating permit is required, unless exempted, for all persons who operate, use or maintain facilities for the storage, treatment or disposal of sludge and/or biosolids.

Domestic Sludge/Residuals

Domestic sludge is a solid by-product that accumulates when domestic wastewater is treated in a wastewater treatment facility. It must be removed periodically to keep the facility operating properly. The department writes permits for wastewater treatment under the state's effluent regulations and NPDES requirements. These permits allow treated water to be discharged into state waters or irrigated onto crop, forest, or pasture land. State operating permits also address sludge in Standard Conditions Part III and require compliance with Part 503 federal regulations.

Industrial Sludge/Residuals

The definition for industrial waste sources under the Missouri Clean Water Law includes all facilities that are not domestic waste sources, namely, wastewater industrial facilities. Industrial sludge is generated by industries not connected to publicly owned treatment works (POTWs) and/or by industries connected to POTWs that require pretreatment of wastewater. The department issues state operating permits to industrial facilities that produce sludge during wastewater treatment or generate residuals as a byproduct of manufacturing processes. These residues must be disposed of by land application, landfill and/or incineration. Industrial permits are written under state regulations and 40 CFR Part 503 regulations.

A generating industry is required to pretreat industrial wastes to reduce pollutants to acceptable levels prior to discharge into a POTW. Sludge removed by the industrial pretreatment process is the responsibility of the generating industry, and has the same requirements as other industrial sludge. Industries may land apply part or all of their waste materials depending on waste characteristics, regulatory requirements, permittee desires and site-specific factors.

Domestic Sludge Land Application: Biosolids

Sludge meeting requirements for land application is called biosolids. Department of Natural Resources Chapter 8 regulations contain the requirements for use and disposal of wastewater sludge. Biosolids are useful to crop and soil requirements by providing nutrients and organic matter. They may also contain heavy metals and other substances that could affect soil productivity and quality of food. Before sludge is applied to crop, forest, or pasture land, the organic and bacterial contents are treated to levels deemed necessary to prevent nuisance odors and public health hazards. Biosolids, as it applies to domestic sludge, must meet treatment process criteria for both pathogens and metal pollutant limitations for beneficial use. Other measures would be required if the processed biosolids are spread on dairy pastures or crops used for human consumption.

Standard Conditions Part III in the state operating permit includes limitations and monitoring requirements, operation and reporting requirements, and best management practices for land application. Best management practices include nutrient management, soil conservation practices and other requirements that ensure biosolids are used properly when stored or disposed. A primary emphasis of the operating permit is to verify that land application is being operated according to an approved plan and that water quality protection is maintained.

Form R – Permit Application for Land Application of Industrial Wastewater Biosolids and Residuals was developed to specifically address land application facilities. This form supplements other permit application forms. Form R contains details of supporting documentation needed to address the regulatory requirements to characterize waste and soils.

Element 8 - Strategic Planning for Future Development

Process for Developing an Inventory and Ranking

Strategic Summary

Long-Term Ability to Address Treatment Project Construction Needs

The department's Financial Assistance Center provides funding for construction projects under the Clean Water State Revolving Fund Loan Program. The low-interest loans are repaid and money is loaned again. Federal funding through EPA has provided the incremental capitalization of the program. The state provides matching funds.

Missouri's construction projects funding needs greatly exceed the available funds. The program is making progress towards meeting the massive needs, but will need to be significantly accelerated if the needs are going to be addressed in a timely manner. Each year, requests for funding far exceed the amounts available.

The department continues to work with the State Revolving Fund finance team to refine the program structure, and will continue to evaluate possible future program structures to ensure the program provides a stable source of funding for clean water infrastructure projects well into the future.

A recent example of an enhancement of the current program structure is the department's decision to use the ability of the Environmental Improvement and Energy Resources Authority (EIERA) to sell bonds, the proceeds of which would supplement projected annual funding levels. Size of the sales would be based on current Clean Water SRF loan repayment schedules and projected new loans. A bond sale of \$130 million is anticipated in the near future.

An additional enhancement is the department's decision to allocate a certain percentage of available funding for certain size communities or for high priority project types, such as combined sewer overflows. Funds set aside for this reserve are based on a percentage of the anticipated available funds, the number of applicants ready to proceed, as well as federal and departmental issues.

Funding for new projects is allocated as shown below. Any remaining funds from a specific group would be distributed as necessary to fund other projects that are ready to proceed.

- 40 percent allocated to outstate Missouri
- 30 percent allocated to large metropolitan areas and districts
- 15 percent allocated to address combined sewer overflow projects
- 15 percent allocated to Green Project Reserve incentives and department initiatives

Large metropolitan areas and districts have service area populations of 75,000 or more. Outstate Missouri areas have service area populations of less than 75,000. The department's annual **Intended Use Plan** (IUP) contains additional information on these enhancements. Concurrent to

these implemented enhancements, economics, increasing costs and regulatory issues exist, above and beyond the current funding levels.

The Clean Water SRF program strongly encourages facilities to use full-cost pricing and asset management. This results in stronger, more financially viable water and wastewater systems. At the same time, state, local and the system users' current economic difficulties limit the ability to repay loans, and thus limit the number of construction projects.

At the program level, the interest earnings on clean water SRF funds are not retained, but are used to reduce the interest rate on loans made to wastewater systems. Because interest earnings are not retained, the SRF corpus (total program funding) doesn't grow to keep pace with inflation or increases in construction costs. While the SRF is funded in perpetuity, the buying power is continually eroding.

Without regular influxes of funding at least equal to inflation or the increases in construction costs, the buying power and thus the number of projects funded will decrease in the long term.

Regulatory issues also impact the ability of the SRF to fund the needed construction projects. Any increase in Clean Water Act initiatives, enforcement or regulatory requirements, significantly increase the needs in Missouri. This results in widening the chasm between total needs and total available funding.

Incentives that divert federal capitalization funding away from revolving loans can be important tools, but also have a negative long-term impact on the effectiveness of the SRF in meeting the construction project needs.

SRF projects have and will continue to produce significant water quality improvements. Continued and increased federal funding along with the states maintaining the ability to set funding priorities based on water quality and public health protection will ensure the success of the program in perpetuity.

Element 8 - Inventory of Identified Public Wastewater Works Construction Needs

The department maintains an inventory of identified public wastewater works construction needs. A "need" is a cost estimate for a project that resolves a water quality or a public health problem and is eligible for Clean Water State Revolving Fund loans. Every four years, detailed information on the needs is provided to EPA. After compiling and summarizing the information, EPA issues The Clean Watersheds Needs Survey Report to Congress. The most recent report was published in 2008. The report serves to document and assess the need for publicly owned wastewater treatment facilities, correction of combined sewer overflows and management of storm water nonpoint source pollution in the United States. The report includes EPA's detailed estimates of capital costs (needs) eligible for funding under the State Revolving Fund provisions of the Clean Water Act amendments of 1987. The Clean Watersheds Needs Survey is a joint effort of the states and EPA to meet the requirements of sections 205(a) and 516(b) of the Clean Water Act.

Section 205(a) requires that states receive funds in proportion to the ratio that the estimated cost for all needed publicly owned treatment works in each state bears to the estimated cost of construction for all such treatment works in all of the states. Section 516(b) requires the EPA to report to Congress detailed estimates of the costs of carrying out the act, including the costs for treating effluent nationally. **EPA's Clean Watersheds Needs Survey** provides detailed estimates of the treatment needs by facility for the next 20 years.

Status of the Municipal Wastewater Treatment Infrastructure and Funding

The most recent needs survey, along with more recent information, indicate:

- The total needs estimate for Missouri far exceeds the available SRF loan funding.
- The SRF loan program is making progress towards meeting the massive needs, but would need to be significantly accelerated in order to meet the needs in a timely manner.
- Each year, requests for funding exceed the amount of funds available.
- Most recipients finance system improvements through a combination of voter approved bond indebtedness and user charges. They are limited by what their communities and users can afford in the current economic conditions.
- Any increase in Clean Water Act initiatives, enforcement or regulatory requirements, significantly increase the needs in Missouri. This results in widening the chasm between total funding needs and total available funding.

The Clean Water Commission, the Missouri Department of Natural Resources and the Environmental Improvement and Energy Resources Authority are cooperating to maximize the amount of construction that can be supported by the CWSRF. Through the combined efforts of these agencies, Missouri can be expected to achieve approximately \$1.43 of construction for each \$1 of available EPA and state matching funds at this point in time. This cooperative program to increase the amount of construction is referred to as the State Revolving Fund Cash Flow Model Loan Program.

The department continues to work with the SRF finance team to refine the program structure, and will continue to evaluate possible future program structures to ensure the program provides a stable source of funding for clean water infrastructure projects well into the future.

Process of Inventory and Ranking

Missouri's process for inventory and ranking of public wastewater treatment works construction needs has been in use since the late 1970s. In 1987, the U.S. Congress enacted the federal Clean Water Act amendments that phased out construction grants and authorized the establishment of state revolving loan programs. Missouri uses federal funding programs to help communities that identify themselves through the application process for funding of their wastewater treatment construction works. The state **inventory and ranking process** is continuously modified to be consistent with the requirements of the Clean Water Act and federal regulations.

Applications

The department solicits applications for the SRF program throughout each year. State regulation establishes Nov. 15 as the annual submittal deadline for applications to participate in the programs during the following fiscal year. However, **applications** will be accepted and processed at any time. The regulation also establishes that applications are valid for two IUP cycles or "years." Potential applicants are strongly encouraged to contact the department prior to submitting an application.

Eligible Projects

The department maintains an ongoing list of potential projects for use of available loan funds. Applications received are prioritized as mentioned above. As projects proceed towards funding, they are placed on the funding lists based upon their priority points, their progress towards meeting funding eligibility criteria, and the availability of adequate monies. Staff closely monitor each applicant's progress towards funding eligibility and may shift projects between the lists.

A Clean Water SRF project's readiness to proceed is based upon two criteria; an acceptable debt instrument and the submittal of a complete facility plan. Acceptable debt instruments include, but are not limited to, general obligation bonds and revenue bonds.

Clean Water State Revolving Fund Intended Use Plan

The department is given authority by the state legislature to administer several state grant and loan programs. Each year Missouri prepares the Clean Water State Revolving Fund **Intended Use Plan**, commonly referred to as the Intended Use Plan or IUP.

The IUP distributes Missouri's anticipated SRF Capitalization Grants, matching state funds and loan repayments as loans for the upcoming fiscal year. It contains information regarding the development and management of the SRF priority lists for the SRF Direct Loan and Nonpoint Source Loan Program.

The IUP also contains information regarding assurances mandated by the federal government. One of assurances requires public review and participation in the process of formulating and approving the IUP. The department's public participation efforts include a broad notification and distribution of the draft IUP including a request for review and comments, as well as an invitation to the public hearing. The hearing is conducted to give interested parties the opportunity to interact with staff and provide their input both verbally and in a written format.

The IUP is finalized in September of each year for implementation in the fiscal year which begins in October.

Element 9 - Strategic Planning for Future Development

Permits Issuance Process

Strategic Summary

The Water Protection Program, Water Pollution Control Branch will continue to explore efforts that promote efficiencies in the permit issuance processes. This includes developing additional modules in the ePermitting system giving ePermitting applicability to more permittees. The branch will also explore the possibility of transitioning some site specific permittees to general permits. By allowing coverage under a general permit the branch is able to achieve efficiencies in processing permit renewal applications thus focusing resources toward other initiatives. Over the next several years the branch will continue to synchronize permits by 8-digit HUC. This will provide unique permitting opportunities in the way of pollutant trading, schedules of compliance, and watershed wide permitting approaches. Synchronization will allow the branch to see holistic water quality improvement over an entire area thus having a greater impact.

Element 9 - Permits Issuance Process

Missouri Clean Water Law Section 644.051 RSMo establishes timelines for the Department of Natural Resources to render a decision regarding permit applications. Site-specific permits must be either issued or denied within 180 days of the receipt of an application. The timeline is 60 days for 401 certifications and General Permits that do not require a public notice. The department must return application fees when these deadlines are not met.

General Permits

A general permit is a water pollution control operating permit for categories of facilities with similar characteristics. Each general permit has a standard set of conditions and requirements to protect water quality. These conditions are conservative, because a general permit authorizes discharges to most receiving streams throughout the state. It must be protective whether the discharge flows into a lake, a small stream, etc. But some settings are so sensitive that permit conditions become very restrictive. To avoid making all facilities comply with unnecessary conditions, some settings and receiving streams are excluded from a general permit, and facilities wanting to discharge to those sensitive receiving streams are required to obtain site specific permits. One permit is issued, and qualifying facilities apply for coverage under that permit.

For a general permit to be written for a specific type of operating permit, a request should be submitted to the department to develop one. That request is generally initiated by an organization on behalf of a group of industries. Organizations interested in submitting a petition request for development of a general permit should contact the department Water Protection Program

permitting section for the information that is needed. A separate authorization is required for each operating location. The general permit is five years in duration, and all facilities authorized to operate under the general permit must apply for renewal at least 180 days before the expiration date of the general permit.

Site-Specific Permits

A site specific permit (also known as an “individual permit”) is written for a specific facility. The conditions of the permit are based on the specific regulations that apply to that facility, the sensitivity of the receiving stream. For these facilities, either there is not a general permit available, or they have sought a site specific permit, or they are required to obtain a site specific permit due to the sensitivity of their receiving stream. These permits usually have a five-year cycle. Most site specific permits are for the discharge of treated wastewater from domestic and industrial facilities. Some facilities land-apply their wastewater rather than discharge it. As with general permits, site specific permits are written to protect Missouri’s numeric and narrative water quality standards. But while general permits are necessarily conservative since they authorize discharges in most settings, site specific permits are written with a specific receiving stream in mind. This means that the conditions and effluent limits are tailored to protection of water quality standards for one receiving stream, and may be more or less stringent than a general permit for a similar activity. Permit conditions for a discharge to a typical Ozark stream may be more stringent than necessary for a discharge to the Missouri River, but may not be stringent enough for a discharge to a losing stream whose flow enters groundwater.

Regional Offices

The department’s regional offices review applications for coverage under general permits only. They may also conduct preapplication meetings, site visits and research in support of site specific permits written in the central office.

Central Office

The department’s central office writes all site specific operating permits, as well as the General Permits under which Land Disturbance General Permits (also known as construction stormwater permits) are issued through the department’s ePermitting web portal.

Permit Renewals

A notice is sent from the department to the permittee that the application for renewal must be submitted 180 days prior to the expiration date on the current permit. When the application comes in it is assigned to a permit writer for review. There are many facets of permit writing, but the common items the permit writer will review include: completeness of the application, if there is an application fee and whether it was paid, facility performance with effluent limits, inspection reports, any impacts to the receiving stream or other water quality assessments. Permit applications are entered into the MoCWIS database for tracking.

Public Notice

All permits are placed on public notice. A public comment period runs for 30 days. A public meeting may also be held if there is widespread public comment with the potential for new information with technical merit for issues relevant to the Clean Water Commission authority. A general permit is put on public notice before issuance or renewal, but issuance of coverage to individual facilities seeking authorization under that general permit are not normally put on public notice. However there are some exceptions. For instance, the first-time issuance of a general permit for a Concentrated Animal Feeding Operation (CAFO) is put on public notice. General permits for airports, chemical manufacturing plants, fabricated structured metal plants, foundries, limestone and rock quarries, lubricant manufacturing plants, petroleum storage facilities greater than 50,000 gallons and wood treaters are required to be placed on public notice prior to issuance for a specific facility by state regulation. All site-specific permits are also put on public notice. Site-specific permits usually have a

five-year cycle and are placed on public notice for 30 days prior to issuance or renewal. Sometimes permits are re-drafted and placed back on public notice to resolve major concerns. The department posts draft, site-specific, permits on the internet in order to increase the availability of this information. Comments on the posted permits may be made as described in the public notice. All comments received during the public notice period are considered before issuance of the permit. A summary of any relevant comments and any resulting changes to the permit is provided in the Fact Sheet prior to issuance.

In the event that the department determines it must deny the application for a permit, notice of the denial shall be posted in accordance with state statutes and regulations. If a decision to issue or deny a permit is appealed, the department requests legal representation through the state Attorney General's Office and initiates hearing officer selection. The Attorney General's Office may decide to negotiate terms in the permit. If a settlement is not reached, an adjudicatory hearing is held before the Administrative Hearing Commission. The hearing officer makes a recommendation to the Missouri Clean Water Commission on the merits of the appeal. The Clean Water Commission may then direct the department to change a permitting decision, or support the initial decision and leave it unchanged.

References

Missouri Clean Water Law Section 644.021

Powers and Duties of the Commission, Section 644.036

Prohibited Actions, Section 644.051

Public Hearings, Section 644.066

Public Hearings- how to conduct one, Section 644.116

Rules and Regulations, Section 644.141 Planning Authority, B. Management Authority, C.

Interstate Agencies, D. Termination of Authority; and the department's rules, Section 6, Permits.

Compliance Monitoring and Enforcement

The department's regional offices and Water Protection Program staff coordinate efforts to monitor and maintain compliance at regulated facilities and sites across Missouri.

Regional office inspectors and data managers provide assistance and monitor compliance with the Missouri Clean Water Law, its implementing regulations and applicable permits, by conducting file reviews, Compliance Assistance Visits, compliance inspections, and site investigations. A **compliance assistance visit** is on-site visit conducted by regional office staff at the request of a facility representative, and is intended to improve the facility's understanding of permit and regulatory requirements through guidance and education. File reviews include an evaluation of discharge monitoring reports and other reports submitted by the facility in accordance with permitted requirements. Reports are evaluated for timely submittal, accuracy, completeness and compliance with permitted effluent limitations. Staff also conduct regularly scheduled (i.e., at least once per 5-year permit cycle) compliance inspections at the facility to observe whether or not the facility is in compliance with permit conditions and requirements. Site investigations are also conducted when the department receives an environmental concern reporting violations of the Missouri Clean Water Law.

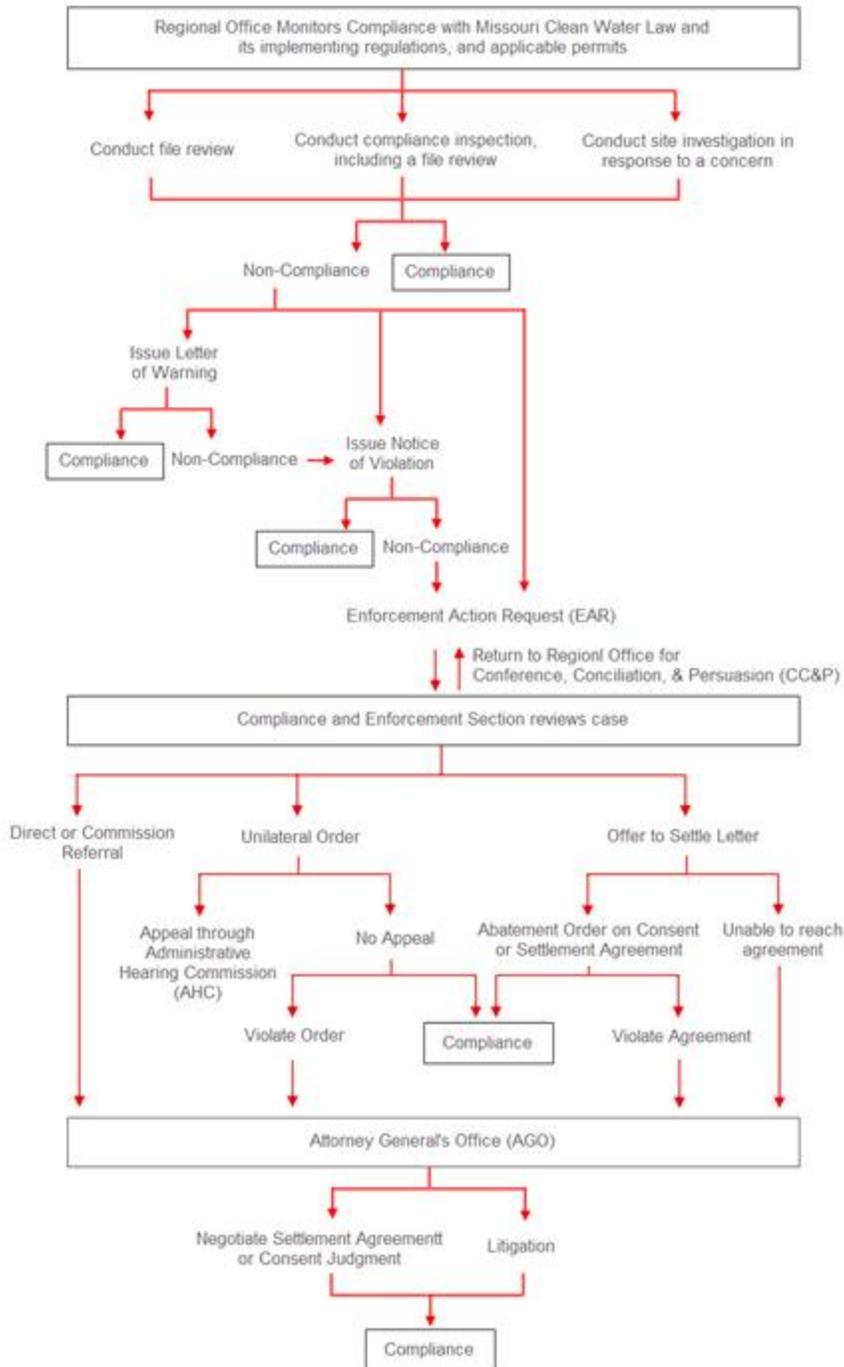
The **Operations Manual** provides staff with guidance on how to conduct compliance assistance visits, inspections, and site investigations. If a facility is found to be in noncompliance, regional office staff evaluate the nature of the violations and determine whether it is appropriate to issue the facility a Letter of Warning or a Notice of Violation, or refer the matter to the Water Protection Program's Compliance and Enforcement Section for elevated enforcement action. Regional office staff consult the **Compliance Manual** for guidance on when to issue letters of warning and notices of violation, and when to refer matters to the department's Compliance and Enforcement Section.

Provided that the violations do not pose an imminent or immediate threat to public health or the environment, regional office staff attempt to use conference, conciliation, and persuasion (CC&P) to achieve voluntary compliance. The purpose of CC&P is to encourage prompt correction of the violation in a cooperative manner, and often includes face-to-face meetings, phone calls, letters and emails to achieve compliance. Approximately 90 percent of the department's enforcement actions are resolved informally through CC&P. CC&P is time-limited; if the violations are not corrected in a timely manner, staff may refer the matter to the Compliance and Enforcement Section to take formal enforcement action to compel compliance.

The Compliance and Enforcement Section reviews regional office and Water Pollution Control Branch activities for consistency with regulatory requirements, and establishes compliance schedules for regulated facilities. This section initiates formal enforcement action to encourage or compel compliance where the responsible party does not voluntarily comply to ensure that regulated facilities and activities are managed by responsible individuals who can effectively operate and maintain them. This section is also involved in the upkeep of the department's database, the Missouri Clean Water Information System (MoCWIS), to ensure basic compliance information is readily available to the public.

The focus of the Compliance and Enforcement Section is on the continued enforcement of the Missouri Clean Water Law and its implementing regulations. The Compliance and Enforcement Section manages a myriad of cases referred by the regional offices, including but not limited to land disturbance sites, municipal and non-municipal wastewater treatment facilities and associated collection systems, industrial stormwater sites and confined animal feeding operations. When facilities are referred to the Compliance and Enforcement Section, staff attempt to negotiate mutual resolutions including compliance schedules, and often civil penalties, to resolve past violations through abatement orders on consent or settlement agreements. When the section's attempts to negotiate a resolution are unsuccessful, the section may request that the Water Protection Program staff director issue a unilateral order requiring compliance or request that the matter be referred to the Missouri Attorney General's Office to achieve compliance.

In 2012, the **Compliance and Enforcement Section** developed a new website to provide transparency to the public regarding the enforcement process. The section posts reports documenting compliance rates and copies of all formal enforcement resolution documents, such as department-issued abatement orders on consent, settlement agreements, and unilateral orders, and court-ordered consent judgments and default judgments. The section is currently developing new processes by which staff can provide communities and businesses with guidance and recommendations to achieve and maintain compliance with the Missouri Clean Water Law, its implementing regulations, and applicable permits. The Compliance and Enforcement Section will continue to update its compliance monitoring and enforcement procedures, and interagency cooperative agreements, on a continual basis to improve transparency, coordination and efficiency.



Clean Water Rules Review

Public comment, during the regulatory development process, is typically offered by the public and interested groups.

Given the volume of clean water rules, the Water Protection Program is offering an opportunity for public comment on any of the rules before their scheduled reviews, beginning July of 2015.

Open for Public Comment:

Send comments to the Water Protection Program via email or in a pdf attached to an email, to the following staff members when the official rules reviews begin or currently:

Chapters 1, 2, 3, 6 and 7: **Carol Garey**

Chapters 4 and 8: **Doug Garrett**

Chapter 9: **Darlene Helmig**

Chapter 14: **Refaat Mefrakis**

As a result of HB 1135, a mandated review of the **following rules** will occur beginning on these dates and every five years thereafter:

- titles 1 through 6 July 1, 2015
- titles 7 through 10, July 1, 2016
- titles 11 through 14, July 1, 2017
- titles 15 through 19, July 1, 2018
- titles 20 and higher, July 1, 2019

Rules Review Process and Criteria

House Bill 1135 mandated a formal review process July 1, 2015 that includes the program's permitting rules, with a maximum of 60 days for the public to submit comments, after publication or notification of official review. Public comments during the 60 day review will be addressed in this mandatory rule review. Comments must be sent during that 60 day comment period. The Water Protection Program's review of its rules will run several months during the formal review. Comments will be formally responded to as required by law.

The Water Protection Program will publish information regarding the formal publication of rules in the *Missouri Register* and will publish a report containing the results of the review together with an appendix of comments and responses attached to the report.