

**Region 4 NPDES Permit Quality Review**  
**South Carolina**  
**Final**

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U.S. EPA Region 4  
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## I. PQR BACKGROUND

National Pollutant Discharge Elimination System (NPDES) Permit Quality Reviews (PQRs) are an evaluation of a select set of NPDES permits to determine whether permits are developed in a manner consistent with applicable requirements established in the Clean Water Act (CWA) and NPDES regulations. Through this review mechanism EPA promotes national consistency, identifies successes in implementation of the NPDES program and identifies opportunities for improvement in the development of NPDES permits.

EPA's review team, consisting of staff from EPA Region 4, EPA Headquarters, and contractor support, conducted a review of the South Carolina NPDES permitting program which included an on-site visit to the South Carolina Department of Health and Environmental Control (DHEC) in Columbia, South Carolina, on May 3-5, 2016.

The South Carolina PQR includes core permit reviews and topic area reviews (including national topics and regional topics). The core permit reviews involve the evaluation of selected permits and supporting materials using basic NPDES program criteria. These reviews focus on core permit quality and include a review of the permit application, permit, fact sheet, and any correspondence, reports or documents that provide the basis for the development of the permit conditions. Reviewers completed the core review by examining selected permits and supporting documentation, assessing these materials using standard PQR tools, and talking with permit writers regarding the permit development process. The core review focuses on the *Central Tenets of the NPDES Permitting Program* to evaluate the South Carolina NPDES program. The PQR also included conversations between EPA and the DHEC staff on program status, the permitting process, responsibilities, organization, staffing, and program challenges the state is experiencing.

National topic area permit reviews are conducted to evaluate similar issues or types of permits in all states. The national topics reviewed as part of the South Carolina PQR were: nutrient requirements, the pesticide general permit, pretreatment, and stormwater permitting.

Regional topic area reviews target regionally-specific permit types or particular aspects of permits. The regional topic areas selected by EPA Region 4 included: Total Maximum Discharge Load (TMDL) implementation, Whole Effluent Toxicity (WET), and resource extraction. These reviews provide important information to South Carolina, EPA Region 4, EPA Headquarters and the public regarding specific program areas.

A total of 15 permits were reviewed as part of the PQR. All permits were reviewed for the core review, and were also reviewed for the regional topic areas. In addition, two general permits for stormwater were reviewed as a part of the PQR. Permits were selected based on issue date and the review categories that they fulfilled.

The discussion in Section II below is based on DHEC's response to EPA interview questions.

## II. STATE PROGRAM BACKGROUND

### A. Program Structure

Within DHEC's, Bureau of Water, the Division of Water Facilities Permitting (DWFP) has the primary responsibility for issuing and administering NPDES permits for non-stormwater. The Water Facilities Permitting Division is located in DHEC's main office in Columbia, South Carolina and from this location develops and issues NPDES permits and provides permit compliance oversight. The Water Quality Division conducts the 303(d) program, water quality modeling, TMDL development, 401 water quality certifications, wetlands regulation, watershed and non-point source programs and other support groups. The Dams Safety and Stormwater Permitting Division has responsibility for stormwater permitting. DHEC has 13 field offices that conduct permit compliance inspections and respond to complaints. DWFP has 17 permit writers. Additional staff support the permitting process by providing numerical modeling for developing permit limits, TMDLs, monitoring/reporting, data management, and administrative support.

The Department has a data management system called Environmental Facilities Information System (EFIS) that is used to support NPDES permit administration. In addition, the Bureau has data systems that are used to manage CWA section 303(d), TMDL and GIS data. The Bureau uses EPA's STORage and RETrieval data system, or "STORET", to manage water quality monitoring data.

The Water Facilities Permitting Division uses a variety of tools to support the development of NPDES permits. Permit writers attend EPA's NPDES permit writers training courses electronically, have access to standard operating procedures and benefit from mentoring by experienced permitting staff. In addition, the Permitting Division has developed document management procedures, database manuals, permitting flowcharts and various guidance memoranda. The Division has developed Excel spreadsheets that are used to tally effluent data and evaluate whether discharges cause or have the reasonable potential to cause or contribute to an excursion above water quality criteria. In addition, the Permitting Division also has developed NPDES permit, rationale and fact sheet templates for use in developing permits and promoting consistent permit documentation. DHEC develops a fact sheet to indicate when a discharger has submitted an application for a NPDES permit. DHEC also develops a rationale that explains the basis for the permit requirements.

NPDES permit quality assurance/ quality control (QA/QC) generally consists of management review of draft permits. The Permitting Division uses QA/QC checklists to structure and document the QA process. All NPDES permits are subject to QA review before being proposed as draft or issued documents.

NPDES permit applications are received and initially managed by the administrative support staff. Permit writers manage the application and permit file until the draft permit is public noticed, at which time the administrative staff will hold the permit file. Permit writers use the file materials during final permit development. Once a permit is issued as final and there is no appeal the permit file is sent to the file room following data input to EFIS (as a data system to interface with EPA's data system). Correspondence, monitoring and reporting data, compliance

records, and other items such as notice of intent (NOI) coverage notices for general permits are maintained in the file room.

## B. Universe and Permit Issuance

As of March 11, 2016, DHEC's NPDES permittee universe was 13,079. The Water Facilities Permitting Division administers 170 NPDES Publicly Owned Treatment Works (POTW) permits (100 major/ 7- non-major) and 231 NPDES non-municipal permits (61 major/ 170 non-major). In addition, the Dams Safety and Stormwater Permitting Division administers stormwater permits for 69 municipal permittees (all except 4 under a Small *Municipal Separate Storm Sewer Systems* (MS4) general permit), 1780 industrial permittees (under an Industrial Stormwater General Permit), and 9812 construction permittees (under a Stormwater Construction General Permit). Another 1017 permittees are covered under the following 10 NPDES non-stormwater general permits:

- Bulk Petroleum Storage Activities
- Discharges from the Application of Pesticides
- Hydrostatic Test Water Discharges from New & Used Oil and Gas Lines & Tanks
- Discharges Associated with Nonmetal Mineral Mining Facilities
- Petroleum Contaminated Ground Water Discharges
- Potable Water Treatment Plants
- Domestic Wastewater Treatment Plant Dischargers
- Utility Water Discharges
- Vehicle Wash Waters
- Discharges Associated with Hydroelectric Generating Facilities.

NOIs for general permits are tracked in a DHEC database.

Significant industries within South Carolina include electric services; organic chemicals, plastics and synthetic fibers (OCPSF); plastics; and textiles.

As of March 11, 2016, approximately 30 percent of DHEC's NPDES major permits were administratively continued and 31 percent of non-major permits were administratively continued.

With regard to the wastewater permit development process, the Water Facilities Permitting Division uses primarily federal NPDES permit application forms for municipal and non-municipal NPDES permits. In addition, the state has several supplemental forms and state application forms for general permits. When applications are received an administrative staff person reviews each application to make sure it is complete and then the application is provided to the section manager for assignment to a permit writer. Municipal and non-municipal permits are assigned based on facility type and the experience of the permit writer. Often a permit will be assigned to the person who previously developed that permit. The domestic permitting manager attempts to predict and identify all domestic permits expected to be submitted or renewed within a year, and assign permits on the same waterbody to one permit writer.

Managers review draft permits. If there are minor modifications to the permits during the five-year cycle, the Director will review and sign that one page (or re-sign the entire permit as appropriate).

Each permit writer downloads STORET and other monitoring data, and also considers groundwater monitoring data if they are available. Permit writers compile the necessary information and draft each permit and rationale. General permits are developed by specific staff, who work with potential permittees to educate them regarding how they must implement each general permit.

The modeling group and the NPDES permitting group actively collaborate to develop permits. The permitting staff reviews all of the wasteload allocations and TMDLs developed and sometimes comments on their development. The permitting staff also work closely with the surface water monitoring group. Permit managers provide a list of the permits coming up for renewal in the next year to the TMDL/wasteload allocation (WLA) group so that they can work on the wasteloads for relevant waterbodies. This workflow can result in permits being published in groups. The Bureau's goal is to model all relevant waterbodies early so that wasteload allocation information is ready when a permit comes due for renewal. The group is currently working on several backlogged permits where the 7Q10 flows were greatly reduced, which normally would lead to tighter limits. The group is performing a very detailed review of low flow statistics, which is delaying issuance of these permits. The timeline for developing a draft permit varies depending on the type of facility and characteristics of the receiving water.

The Water Facilities Permitting Division implements EPA's effluent limitation guidelines (ELG). As appropriate, permit writers might apply technology-based effluent limits (TBELs) based on best professional judgement (BPJ) in situations where an ELG does not explicitly apply, but it is relevant to the activity being permitted. The discussion in the fact sheet or rationale normally identifies when a discharge limit is based on BPJ. In the fact sheet/rationale permit writers indicate what the TBELs and water quality-based effluent limits (WQBEL) each would be and select the limits that are most stringent.

Permit writers consider ambient, STORET, intake water and general monitoring data in the development of WQBELs. If a facility is located in a source water protection area, it normally is allowed less dilution credit when reasonable potential analysis (RPA) are performed. Permit writers use a spreadsheet that is shared across the different NPDES groups for conducting RPAs. Ambient data is considered if available as well as any TMDL information when conducting the RPA. The RPA process and analysis follows EPA's Technical Support Document (TSD). Relevant formulas are described in the rationale/fact sheet.

Permit writers identify pollutants of concern using permit application data, and evaluate the data in the RPA spreadsheet. The RPA spreadsheet indicates the source for the applicable standard. Permit writers also look to see if there are any other parameters of concern (e.g. by-products that may result from the breakdown of certain chemicals, the permit writers may know about groundwater analysis in the area, or they may have experience with similar

facilities). Reasonable potential is determined based on the RPA spreadsheet. Permit writers also consider data variability and the number of samples taken in developing limits.

With regard to dilution, permits reflect permissible mixing within the receiving waters. DHEC has established specific mixing zone standards, and where related to a mixing zone for whole effluent toxicity (WET) testing, facilities must submit mixing modeling calculations (e.g., CORMIX) which are verified by Permitting Division staff. Alternative mixing methods (e.g., dye study) can also be done with results submitted for consideration. For a major facility, permit writers receive a four-page wasteload allocation from the wasteload allocation group. This document typically addresses Dissolved Oxygen (DO), ammonia toxicity, and sometimes nitrogen or phosphorus. The WLA will also consider existing TMDLs or 5R<sup>1</sup> TMDL alternatives. For a minor facility permit writers receive a one-page printout. Mixing and wasteload allocations are documented by the models or in technical support memos. Permit writers summarize the results of these analyses in the rationale or in documents referenced in the rationale. The Permitting Division allows mixing zones for WET testing and temperature, and assumes complete mixing for chemical-specific parameters.

Anti-backsliding restrictions are considered for any proposals submitted by the permittee for less stringent limits or increased loadings. The permit writer would not increase the allowable limit if the facility is meeting the existing limit. If the facility has trouble meeting the existing limit, DHEC tends to keep the established limit for what they are currently meeting. If there is a new TMDL then the permit writer would explain that there is no backsliding because there is a TMDL.

State antidegradation requirements are addressed in South Carolina regulations (61-68) and implementation procedures are posted on the state's website. DHEC cannot issue a permit that would violate water quality standards in Tier I waters. For Tier II waters, expanded and new discharges must go through a waterbody by waterbody alternatives analysis (if it will lower water quality, there must be an important social or economic justification). New or expanding facilities must also develop a Preliminary Engineering Report (PER) to show the alternatives considered and corresponding economic/technological analysis. Antidegradation documentation is part of the permit record and is discussed in fact sheets, rationales, and public notices. Under state regulations, compliance with the CWA section 208 plans satisfies the requirements for the local economic and social analysis. NPDES permits must then be consistent with state 208 plans.

Non-municipal permit monitoring frequency is based on how often the permittee has had a sample that exceeds a practical quantitation limit (PQL). Municipal permit monitoring frequency is based on the design flow of the facility. In some situations, monitoring frequency

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<sup>1</sup> The 5R approach embraces local watershed restoration efforts by providing the State an opportunity to work with the public and private stakeholders to develop a watershed restoration plan that should improve water quality without the need of a TMDL. States that place impaired waterbodies in the 5R subcategory may set TMDL development schedules that extend beyond the 8 to 13-year timeframe generally suggested by EPA so that the water quality restoration activities are provided sufficient time to make progress towards achieving water quality restoration.

can be reduced (e.g., long history of compliant monitoring, installation of new, efficient equipment) and in others it may be increased (e.g., if a facility is close to violating its limits or is having trouble meeting them).

South Carolina has not yet adopted the sufficiently sensitive methods federal regulation requirements, but implements the federal requirements in their permits. Currently, the PQL list of pollutants used for permitting specifies the PQL that must be met. If a facility uses an incorrect PQL then DHEC will inform the facility that DHEC cannot determine whether the facility has reasonable potential to discharge a pollutant of concern, so it may assume the facility does have reasonable potential and provide a specific limit in the permit. Permittees can use a zero value as part of its data if the facility uses the proper PQL and the measured value is below that PQL.

South Carolina applies water quality standards for *E. coli* in freshwater and enterococcus in marine water. These requirements were updated in 2012. For impaired waters, a TMDL for bacteria does not change the pathogen limit in permits because all facilities are subject to pathogen limits applied at end-of-pipe. The permit may require more frequent sampling where a TMDL exists. Permit writers routinely work with wasteload/TMDL staff who develop wasteload allocations. In some cases, the permit staff may delay issuing a permit until a TMDL is final so the permit can implement the TMDL. South Carolina has developed some extensive Dissolved Oxygen TMDLs. TMDL implementation is discussed in each permit rationale, however, there is no master list of TMDL implementation. As permits are renewed, permit writers work with the TMDL staff to coordinate implementation. Most TMDLs in the state address bacteria with limits applied at end-of-pipe, which is often why permit rationales do not discuss TMDLs.

The required Discharge Monitoring Reports (DMRs) are typically submitted monthly, except for general permits. No DMRs are required under the state's pesticide general permit. For other general permits, DMRs are required once a year at a minimum. Hydroelectric generating facility monitoring is quarterly, with yearly reporting. For compliance schedules, if a task will require more than nine months to complete, the permittee must submit an interim report.

South Carolina has adopted pretreatment programmatic and biosolids narrative conditions based on EPA conditions in 40 CFR 122, 403, and 503 respectively, though the biosolids (sewage sludge) program is not delegated to South Carolina. Part V of the South Carolina NPDES permit template includes special conditions (e.g., odor requirement, maintenance requirements, etc.). Standard permit conditions have recently been updated as part of electronic-DMR requirements. State regulation R61-9, section 122 generally follows EPA 40 CFR Part 122.

Permit writers use templates to aid in developing both fact sheets and rationales and tailor aspects of each fact sheet and rationale for each permit. Fact sheets compile data from the permit application and historical information about the facility and also describe permit development and issuance processes. The rationale describes the facility, waterbody, effluent characteristics and the basis for the limits included in each permit.



For federally issued permits or licenses, Water Quality Division staff develop the CWA section 401 certification.

Two staff members coordinate the public notice of each draft permit in relevant newspapers. For new facilities more detailed information is included. Public notices are published in the newspaper and also are placed on a DHEC webpage. All DHEC permits are placed on the agency webpage, which has the ability to electronically document each step of the public notice process. DHEC maintains a public notice mailing list. At permit hearings DHEC collects email addresses and can then send out any agency response to issues raised at a hearing. When DHEC knows a topic or decision is going to be controversial it schedules a hearing as a matter of standard practice. For new permits, DHEC allows the permittee to request a public hearing up front. At hearings DHEC typically receives feedback from interested stakeholders. A record is maintained of each hearing, including follow-up actions and notices of decisions (notices are posted on the DHEC website or in other places where the item has previously been published).

Few permit objections or permit appeals are received by the Permitting Division. Objections or appeals are initially reviewed by the South Carolina Board of Health and Environmental Control. A guide to the Board's review process is on the DHEC webpage and this guide is attached to each permit. An administrative law judge hears appeals from Board decisions, whereas, most permit appeals have been sought by the permittee. Except for coal ash impoundments, there have not been a large number of objections or comments from third parties on South Carolina NPDES permits.

Active permit files are maintained by either the administrative or permitting staff. Following permit issuance, each permit file is kept on-site in DHEC offices during the term of the permit. For each permit, typically there is a [brown] file that includes the active permit with the permit application and the previous permit, as well as a [green] file that includes modeling documentation, public notice correspondence and (sometimes) the draft permit. The official administrative records for NPDES permits are maintained in the DHEC file room as well as in off-site storage for items that have been scanned for archive. These scanned materials are archived off-site due to space limitations.

### **C. State-Specific Challenges**

The Water Facilities Permitting Division indicated that financial support for the wastewater and stormwater permitting programs is a constant challenge. They also noted that addressing nutrients and developing nutrient standards is very challenging. South Carolina has numeric standards for lakes 40 acres or greater for phosphorous, nitrogen, and chlorophyll-a. DHEC is working on developing nutrient standards for estuaries. Most nutrient impairments in the state are phosphorous-based, not nitrogen. The upstate coal-ash impoundments have gained significant public interest since the containment failures at sites in neighboring Region 4 states. Historic flooding in 2015 caused significant damage to multiple dams throughout the eastern region of the state. They are still recovering from this flood event and staff were re-organized to cover issues and provide better support and oversight for the Dams Safety Program. Major

textiles employer Galey & Lord closed its facility, but Volvo® Cars, now a Chinese-owned automaker, is set to build an assembly facility in the coastal Charleston area.

Since the initial review and visit to the state, another significant flooding event occurred in early October 2016 as Hurricane Matthew moved up the eastern coast of the southern United States. EPA Region 4's requests for additional updates to the South Carolina Confined Animal Feeding Operation (CAFO) program have been hampered due to the limited resources available to handle the additional activities. However, Region 4 was able to obtain a statement from DHEC indicating there are currently no CAFO operations that meet the discharge definition and therefore do not require NPDES permits. As a delegated state program, South Carolina must have state regulations for CAFOs that meet the EPA's 2008 Final CAFO regulation. The State is required to have an NPDES permit available to issue to CAFOs in the event that State or Federal enforcement identifies an operation that discharges to jurisdictional waters of the State or a facility voluntarily discloses this information. Region 4 has recently reviewed the Nutrient Management Plans (NMP) for several of the "large" CAFO facilities in South Carolina, and has noted some deficiencies. Region 4 continues to have dialog with DHEC on this issue.

## **D. Current State Initiatives**

Significant initiatives in South Carolina include:

- An extensive TMDL on the Catawba River;
- Recently completed the Savannah Harbor DO – TMDL alternative (or 5R) process;
- DHEC is working on updates to increase their information managed electronically. DHEC is replacing the whole e-system currently in place. This will allow the Permitting Division to receive applications electronically. This is an agency-wide initiative but the water program is making the transition first due to the recent federal e-Reporting Rule. DHEC has indicated to the EPA that their target date for completing this action is December 2017.

## **III. CORE REVIEW FINDINGS**

### **A. Basic Facility Information and Permit Application**

#### **1. Facility Information**

Basic facility information is necessary to properly establish permit conditions. For example, information regarding facility type, location, processes and other factors is required by NPDES permit application regulations (40 CFR 122.21). This information is essential for developing technically sound, complete, clear and enforceable permits. Similarly, fact sheets must include a description of the type of facility or activity subject to a final permit.

The core permits as reviewed authorize the discharge subject to specific permit conditions, identify the receiving water, identify the permit issuance, effective, and expiration dates, and provide for a term of five years or less. The rationales and fact sheets for the core permits include a clear description of the related facilities. Each rationale indicates whether the facility

is new or existing (reissuance), whether expansion is occurring, and/or whether the action is a permit modification.

For the non-POTW permits, the rationales generally included a good description of the processes or services conducted by the facility and the waste streams discharged. The description in the rationale(s) of the municipal facilities is very basic (e.g., only provided SIC code 4592 and a description as “wastewater treatment plant”). The permits and rationales include the street or mailing location of the facility. For both the municipal and non-POTW permits, the specific location of the outfall(s) (i.e., latitude and longitude) was identified in the permit application.

## **2. Permit Application Requirements**

Federal regulations at 40 CFR 122.21 and 122.22 specify application requirements for permittees seeking NPDES permits. Although federal forms are available, authorized states are permitted to use their own forms provided they include all information required by the federal regulations. This portion of the review assesses whether appropriate, complete, and timely application information was received by the state and used in permit development.

The Water Facilities Permitting Division uses primarily federal NPDES permit application forms for municipal and non-municipal NPDES permits. For general permits and other activities, applicants use state developed application forms, and as needed, state provided supplemental forms. Completed permit applications were identified for the core permits reviewed in each of the respective permit files and most appeared to be submitted in a timely manner. All of the required application forms were present for both the municipal and non-municipal permits and were in good order. The permit applications reviewed included most of the effluent sampling data required.

For one permit (SC0035360), the original application was submitted in a timely manner and initially declared complete. As part of the detailed technical review, additional information was requested by the permit writer and received after the permit expired which is acceptable. For this facility, the process waste stream discharges under a separate, industrial user, pretreatment permit to a POTW. Federal regulations for CWA §316(a) & (b) also apply to this facility based on its effluent temperature and cooling water intake volume. The permit also includes a DHEC sampling waiver allowing that “non-contact cooling water” through “outfall 01A” may discharge to the receiving stream. EPA’s review discovered that discharges through outfall 01A include unspecified “floor drains” to the Catawba River that were not identified explicitly in the permit.

## **B. Technology-based Effluent Limitations**

NPDES regulations at 40 CFR 125.3(a) require that permitting authorities develop technology-based requirements where applicable. Permits, fact sheets and other supporting documentation for POTWs and non-POTWs were reviewed to assess whether technology-based effluent limitations (TBELs) represent the minimum level of control that must be imposed in a permit.

## *1. TBELs for POTWs*

POTWs must meet secondary or equivalent to secondary standards (including limits for five day-Biological Oxygen Demand (BOD<sub>5</sub>), Total Suspended Solids (TSS), Hydrogen-ion concentration (pH), and percent pollutant removal), and must contain numeric limits for all of these parameters (or authorized alternatives) in accordance with the secondary treatment regulations at 40 CFR Part 133. Six POTW permits were reviewed as part of this PQR for TBEL implementation.

The fact sheets and rationales for the municipal core permits reviewed include a very basic description of the facility and, in general, these documents do not describe the treatment process. The rationales do specify the standards applied (e.g., secondary treatment) and consistently discuss the basis for the effluent limits in these permits, including when limits are based on a wasteload allocation developed as part of a TMDL. All of the core municipal permits reviewed included limits that are equal to or more stringent than secondary treatment, and provided a comparison of previous permit limits for reference. These permits typically also include limits for ammonia, total residual chlorine (TRC), DO, *E. coli*, WET, as well as any metals and nutrients based on reasonable potential. Relevant limits were specified in appropriate units and forms (i.e., concentration or mass; average weekly and average monthly).

## *2. TBELs for Non-POTW Dischargers*

Permits issued to non-POTWs must require compliance with a level of treatment performance equivalent to Best Available Technology Economically Achievable (BAT) or Best Conventional Pollutant Control Technology (BCT) for existing sources, and consistent with New Source Performance Standards (NSPS) for new sources. Where federal effluent limitations guidelines (ELGs) have been developed for a category of dischargers, the TBELs must be based on the application of these guidelines. If ELGs are not available, a permit must include requirements at least as stringent as BAT/BCT developed on a case-by-case using best professional judgment (BPJ) in accordance with the criteria outlined at 40 CFR 125.3(d).

Seven non-municipal permits were reviewed during this PQR. Two of these permits (SC0041378 and SC0000485) are subject to ELGs, although [it was later determined] SC0041378 has ceased operation and is no longer subject to 40 CFR Part 440. The rationales for these permits include waste stream characterization information, describe treatment, and identify the applicable discharge standards and limits. The limits in SC0000485 were consistent with the applicable ELG. The rationales for all seven of these permits include a section (Section I for non-municipal permits) that details the basis for each limit, which is very informative. Two of the permits included limits based on BPJ (SC0039021 and SC0000485). Numerous other limits in these seven permits are based on water quality standards. The limits in the non-POTW permits are expressed in appropriate units and forms. The permit rationales provide generic examples of limit calculations, however, specific calculations are part of the wasteload allocation spreadsheets. EPA suggests the permit(s) rely less on referring to the applications for additional information. The permit document should clarify all data needed to be a protective shield.

## C. Water Quality-Based Effluent Limitations

The NPDES regulations at 40 CFR 122.44(d) specify permits include any requirements in addition to or more stringent than technology-based requirements where necessary to achieve state water quality standards, including narrative criteria for water quality. To establish such “water quality-based effluent limits” (WQBELs), the permitting authority must evaluate the proposed discharge and determine whether technology-based requirements are sufficiently stringent, and whether any pollutants or pollutant parameters could cause or contribute to an excursion above any applicable water quality standard. Generally, this is called a “Reasonable Potential Analysis”, or RPA.

The PQR assessed the processes employed by permit writers and water quality modelers to implement these requirements and perform RPA of proposed limits. Specifically, the PQR reviewed permits, fact sheets, and other documents in the administrative record to evaluate how permit writers and water quality modelers:

- determined the appropriate water quality standards applicable to receiving waters,
- evaluated and characterized the effluent and receiving water including identifying pollutants of concern,
- determined critical conditions,
- incorporated information on ambient pollutant concentrations,
- assessed any dilution considerations,
- determined whether limits were necessary for pollutants of concern and,
- calculated such limits or other permit conditions where appropriate.

For impaired waters, the PQR also assessed whether and how permit writers consulted and developed limits consistent with the assumptions of applicable EPA-approved TMDLs.

The rationales for the core permits reviewed consistently identify the relevant receiving water by name and use designation, based on the State’s regulations. The use designation is represented by a one to two letter designator so the specific use must be looked up in the state regulations, outside of the permit. This is a detraction from the permit as the regulation(s) may not be easily found and the reader is required to search for the description. A full description of the use designation should be articulated in the documents for the benefit of the reader. Each rationale also indicates whether the receiving water is impaired, and if so, for what, as well as whether the receiving water is subject to a TMDL and the pollutant or basis for the TMDL.

The permit rationales include a thorough discussion of the process used by DHEC to determine reasonable potential and calculate limits. This discussion is based on EPA’s Technical Support Document (TSD) and is detailed, although it only provides a generic discussion of the limit development process. Specific data are described when evaluating reasonable potential and application of water quality standards (WQS), allowances for mixing, and calculation of final limits. The permit-specific results of the RPA and limit calculation process are presented in Sections I (for non-municipal permits) and III (municipal permits) of each rationale, which also

describes prior limits, data considered, WQS, as well as new limits and their basis. The rationales explain which limits are based on the wasteload allocations calculated, and the permit file includes the wasteload allocation and limit calculations spreadsheets, including effluent data, which also reflect the pollutants evaluated. These spreadsheets are well structured and easy to follow. Wasteload allocation worksheets, which are part of the state's wasteload allocation documentation, were identified in the permit development record.

For two permits (SC0046345 and SC0045811), the associated spreadsheets indicated reasonable potential for several parameters, however, a limit was initially excluded in one of these permits. Specifically, in SC0046345; *1,2,4 trichlorobenzene* was not subject to a limit. The [issued] rationale did not explain why, but DHEC later explained the rationale was not corrected after a typographical error was found in the spreadsheet. The rationales for NPDES permits explain the basis for including effluent limitations and other decisions. Major changes or missing data should always be included in the file and/or appropriately public noticed for transparency. With respect to the findings of insufficient number of samples, DHEC clarified that if a renewal application is received without two-species used for the WET testing, additional tests will be required before the RPA can be performed. This may cause a delay in issuing a final permit, or might hold the draft permit from being public noticed until those tests can be performed and the data submitted. If the data collection can't be submitted to make the permit renewal application "timely and complete" and the permit will expire before the permit can be renewed, DHEC will issue an order to the facility to require compliance with the prior permit until the data can be submitted and permitting staff can complete the permit renewal. The POTW permits reviewed did include WET limits and the rationales explained the need for these limits.

#### **D. Monitoring and Reporting**

NPDES regulations at 40 CFR 122.41(j) require permittees to periodically evaluate compliance with the effluent limitations established in their permits and provide the results to the permitting authority. Monitoring and reporting conditions require the permittee to conduct routine or episodic self-monitoring of permitted discharges and where applicable, internal processes, and report the analytical results to the permitting authority with information necessary to evaluate discharge characteristics and compliance status.

Specifically, 40 CFR 122.44(i) requires NPDES permits to establish, at minimum, annual monitoring for all limited parameters sufficient to assure compliance with permit limitations, including specific requirements for the types of information to be provided and the methods for the collection and analysis of such samples. In addition, 40 CFR 122.48 requires that permits specify the type, intervals, and frequency of monitoring sufficient to yield data which are representative of the monitored activity. The regulations at 40 CFR 122.44(i) also require reporting of monitoring results with a frequency dependent on the nature and effect of the discharge.

The core permits reviewed require monitoring for all of the parameters subject to permit limits and specify the frequency and location of such monitoring. The core permit monitoring

requirements appeared sufficient to assess compliance with effluent limitations. All of the core permits reviewed require sampling and analysis methods consistent with 40 CFR Part 136, and require that monitoring information be reported on monthly DMRs. However, not all of the permits reviewed required the use of sufficiently sensitive methods for sampling and monitoring analysis, and to date, South Carolina has not statutorily adopted the Sufficiently Sensitive Rule that became effective Sept 18, 2014.

## **E. Standard and Special Conditions**

Federal regulations at 40 CFR 122.41 require that all NPDES permits, including NPDES general permits, contain an enumerated list of “standard” permit conditions. Further, the regulations at 40 CFR 122.42 require that NPDES permits for certain categories of dischargers must contain additional standard conditions. Permitting authorities must include these conditions in NPDES permits and may not alter or omit any standard condition, unless such alteration or omission results in a requirement more stringent than required by federal regulations.

In addition to standard permit conditions, permits may also contain additional requirements that are unique to a particular permittee or discharger. These case-specific requirements are generally referred to as “special conditions.” Special conditions might include requirements such as: additional monitoring or special studies such as pollutant management plan or a mercury minimization plan; best management practices [see 40 CFR 122.44(k)], or permit compliance schedules [see 40 CFR 122.47]. Where a permit contains special conditions, such conditions must be consistent with applicable regulations.

The core permits reviewed include the standard permit conditions specified in 40 CFR 122.41. In general, these are organized similar to the federal provisions. A few provisions are located elsewhere in the permits (e.g., compliance schedules). Overall, the state standards conditions appear to be consistent with federal standard conditions. The core permits reviewed also include certain special conditions. These vary by permit and include sludge disposal and monitoring provisions, land application requirements, operator requirements, pretreatment provisions, groundwater provisions, compliance schedules, biological assessments, and other special requirements.

## **F. Administrative Process**

The administrative process includes documenting the basis of all permit decisions (40 CFR 124.5 and 40 CFR 124.6); coordinating EPA and state review of the draft (or proposed) permit (40 CFR 123.44); providing public notice (40 CFR 124.10); conducting hearings if appropriate (40 CFR 124.11 and 40 CFR 124.12); responding to public comments (40 CFR 124.17); and, modifying a permit (if necessary) after issuance (40 CFR 124.5). EPA discussed each element of the administrative process with DHEC, and reviewed materials from the administrative record as they related to the core permit review.

The files reviewed for the core permits include documentation that the respective public notices were published and that the notices for the respective draft permits include information required by 40 CFR 124.10. Public comments and responses were identified in one

permit file but were not identified for most of the core permits reviewed. The EPA considers this an issue of transparency within the program, and not a regulatory issue. South Carolina has few permit appeals for their final permits. Incidentally, one permit had been modified but the change was minor, did not require public notice, and the modifications were documented and explained in the relevant permit rationale and file.

## **G. Administrative Record**

The administrative record is the foundation that supports the NPDES permit. If EPA issues the permit, 40 CFR 124.9 identifies the required content of the administrative record for a draft permit and 40 CFR 124.18 identifies the requirements for a final permit. Authorized state programs should maintain equivalent documentation under 40 CFR 123.25. The record should contain the necessary documentation to justify permit conditions. At a minimum, the administrative record for a permit should contain the permit application and supporting data; draft permit; fact sheet or rationale; all items cited in the rationale or fact sheet including calculations used to derive the permit limitations; meeting reports; correspondence between the applicant and regulatory personnel; all other items supporting the file; final response to comments; and, for new sources where EPA issues the permit, any environmental assessment, environmental impact statement, or finding of no significant impact.

Current regulations require that fact sheets include information regarding the type of facility or activity permitted, the type and quantity of pollutants discharged, the technical, statutory, and regulatory basis for permit conditions, the basis and calculations for effluent limits and conditions, the reasons for application of certain specific limits, rationales for variances or alternatives, contact information, and procedures for issuing the final permit.

Each of the core permit files reviewed includes the permit application and associated data, fact sheet and/or rationale, discharge data, reasonable potential and wasteload allocation output tables, public notice, wasteload allocation worksheet, select correspondence, and public comments with DHEC responses in cases where comments were submitted. These documents support WQBEL development and are referenced in the respective fact sheets or rationales. The files were well organized. Materials in the files explained where and why a permit may have been modified. Individual pages are initialed by management for concurrences of corrections or minor modifications.

The Water Facilities Permitting Division develops fact sheets based on NPDES permit applications and develops permit rationales that explain and support each permit. For some permits these are combined. The fact sheets generally include eight sections (Synopsis, Proposed Effluent Limitations, Monitoring Requirements, Proposed Compliance Schedule, Proposed Special Conditions, Water Quality Standards and Effluent Standards Applied to the Discharge, and Procedures for a Final Determination). Rationales for municipal permits typically include Facility Design Flow value and Discharge Information, General Information, Rationale Guidance Procedures, and Permit Limitations and Monitoring Requirements. Rationales for industrial permits typically include Facility production values and Discharge Information, Permit Limitations and Monitoring Requirements, General Information, Background and Procedures



for Permit Limit Development, and Procedures for Reaching a Final Permit Decision. These rationales are detailed and present a good description of the basis for the permit requirements. No hearing records were identified for the core permits reviewed. DHEC uses an administrative checklist to ensure completeness of the process and record.

### *1. Documentation of Effluent Limitations*

Permit records for POTWs and industrial facilities should contain comprehensive documentation of the development of all effluent limitations. Technology-based effluent limits should include assessment of applicable standards, data used in developing effluent limitations, and actual calculations used to develop effluent limitations. The procedures implemented for determining the need for WQBELs as well as the procedures explaining the basis for establishing, or for not establishing, WQBELs should be clear and straight forward. The permit writer should adequately document changes from the previous permit, ensure draft and final limitations match (unless the basis for a change is documented), and include all supporting documentation in the permit record.

With regard to the documentation supporting TBELs in the non-municipal permits, the rationales presented clear descriptions of the respective facilities. For these permits the rationales include waste stream characterization information, identify the applicable discharge standards, and the describe treatment processes. The rationales for all seven permits reviewed include a section (Section I) that indicates the basis for each permit limit. Two of the permits included limits based on BPJ (SC0039021 and SC0000485) and the basis for these limits is explained in the respective permit rationales. SC0039021 is for a minor facility's discharges. SC0000485 is currently rated as a major facility, but has reduced its production since the previous permit's renewal. This permit when reissued reflected the reduction in production rate, and the reduction of allowable pollutant loading limits to the receiving stream. The major rating sheet should also be revised as a result of the reduced loading. The current rationale for SC0000485 explains how the characterization and performance levels were determined. Numerous other limits in these seven permits are based on water quality standards. Most of the limit calculations are part of the wasteload allocation spreadsheets. The permit rationales also include generic examples of limit calculations. The rationales reference supporting attachments and previous permit limits which are documented in the respective files. While generic examples of limit calculations are helpful, the rationales should reflect the actual calculations made to establish final permit limitations.

With regard to documentation supporting the development of WQBELs, the rationales for the core permits reviewed consistently identify the relevant receiving water by name and include a signifying system of letters for the waterbody's designated use (the specific use is described in the state regulations, e.g., "FW" indicates "Fresh Water"). The rationales also indicate whether the receiving water is impaired, and if so, for what pollutant, as well as whether the receiving water is subject to a TMDL and the pollutant or basis for the TMDL. The permit rationales provide a detailed discussion of the process used by DHEC to determine reasonable potential and calculate limits. The discussion describes which data are considered when evaluating reasonable potential and defines the standards, mixing zones, and calculation of limits. The

permit-specific results of the reasonable potential and limit calculation process are presented in Sections I (for non-municipal permits) and III (municipal permits) of each rationale. The rationales explain which limits are based on the wasteload allocations calculated, and the permit file retains the wasteload allocation and limit calculations spreadsheets, including effluent data, which also reflect the pollutants evaluated. DHEC selects the most stringent standard between TBELs and WQBELs.

For permit SC0048411, limits for two parameters have been carried forward from previous permits, and while the rationale explains the basis for these limits specific calculations were not included in the rationale. Each permit is unique; certain data should be included to provide a thorough understanding of the reasoning behind the effluent limits permitted for transparency to the public. For permit SC0002798, the receiving water body is impaired for phosphorus, a TMDL is yet to be developed and so monitoring and reporting data required by the permit is a part of the process. No increased loadings were allowed. However, certain monitoring was waived as mentioned in the rationale for SC0002798, but an explanation for this monitoring waiver was not mentioned in the final permit.

The permit rationales include standard anti-backsliding language that explains that “When a permit is reissued, the terms and conditions of the reissued permit must be at least as stringent as those final limits in the previous permit unless certain exceptions are met (see Regulation 61-9.122.44.1.)”. Clarity with anti-backsliding restrictions could be increased in these situations. Three permits (SC0023035, SC0046345, and SC0047872) removed limits or made a limit less stringent than the previously issued permit, their rationales mathematically supported the changes. Similarly, the permit rationales include standard language that indicate that an antidegradation assessment is completed for new facilities or expansions of existing facilities, and indicate whether each respective permit application is for a new or expanding facility. One permit (SC0046345) included limits for two flows, but it was not clear whether this was an expansion under this permit or the previous permit (no discussion of antidegradation beyond the standard language was included). The state later explained these two flow were justified in the prior permit and agreed this could have been made more clear.

## H. National Topic Areas

National topic areas are aspects of the NPDES permit program that warrant review based on the specific requirements applicable to the selected topic areas. These topic areas have been determined to be important on a national scale. National topic areas are reviewed for all state PQRs. The national topics areas are: nutrients, pesticides, pretreatment, and stormwater.

### 1. *Nutrients*

#### *Background*

For more than a decade, both nitrogen and phosphorus pollution has consistently ranked as one of the top causes of degradation of surface waters in the U.S. Since 1998, EPA has worked at reducing the levels and impacts of nutrient pollution. A key part in this effort has been the support EPA has provided to states to encourage the development, adoption and

implementation of numeric nutrient criteria as part of their water quality standards (see the EPA's *National Strategy for the Development of Regional Nutrient Criteria*). In a 2011 memo to the EPA regions titled *Working in Partnerships with States to Address Nitrogen and Phosphorus Pollution through use of a Framework for State Nutrient Reductions*, the Agency announced a framework for managing nitrogen and phosphorus pollution that, in part, relies on the use of NPDES permits to reduce nutrient loading in targeted or priority watersheds. The PQR looked at how nutrients are addressed in the NPDES permitting program in South Carolina and implementation of this framework.

To assess how nutrients are addressed in the South Carolina NPDES program, EPA Region 4 reviewed five permits as well as response to the program questionnaire sent prior to the state visit. From the questionnaire, DHEC indicated South Carolina has adopted numeric water quality criteria for both Nitrogen and Phosphorus for their lakes. In addition to this DHEC includes the following in their Rationales:

Discharges of nutrients from all sources, including point and non-point, to waters of the State shall be prohibited or limited if the discharge would result in or if the waters experience growths of microscopic or macroscopic vegetation such that the water quality standards would be violated or the existing or classified uses of the waters would be impaired. Loading of nutrients shall be addressed on an individual basis as necessary to ensure compliance with the narrative and numeric criteria.

Numeric nutrient criteria for lakes are based on an ecoregional approach that takes into account the geographic location of the lakes within the State and are listed below. These numeric criteria are applicable to lakes of 40 acres or more. Lakes of less than 40 acres will continue to be protected by the narrative criteria. For the Piedmont and Southeastern Plains ecoregions of the State, total phosphorus shall not exceed 0.06 mg/l, chlorophyll *a* shall not exceed 40 ug/l, and total nitrogen shall not exceed 1.50 mg/l.

In evaluating the effects of nutrients upon the quality of lakes and other waters of the State, the Department may consider, but not be limited to, such factors as the hydrology and morphometry of the waterbody, the existing and projected trophic state, characteristics of the loadings, and other control mechanisms in order to protect the existing and classified uses of the waters.

The Department shall take appropriate action, to include, but not limited to: establishing numeric effluent limitations in permits, establishing Total Maximum Daily Loads, establishing waste load allocations, and establishing load allocations for nutrients to ensure that the lakes attain and maintain the above narrative and numeric criteria and other applicable water quality standards.

#### *Program Strengths:*

To implement specific numeric-based limits in permits, procedures are in place to calculate values based on a variety of background data provided by the permittee and any state database information. There are no obstacles in state law preventing DHEC from fully implementing nutrient permit requirements once they are established. Studies to evaluate numeric standards for estuaries along the coast of South Carolina are ongoing. DHEC had previously negotiated a priority plan with EPA for developing numeric nutrient criteria for other waters.

*Critical Findings:* None.

## 2. Pesticides

### *Background*

On January 7, 2009, the Sixth Circuit vacated the EPA's 2006 NPDES Pesticides Rule on Aquatic Pesticides (71 Fed. Reg. 68483, November 27, 2006) and found that point source discharges of biological pesticides and chemical pesticides that leave a residue, into waters of the U.S. were pollutants under the CWA. *National Cotton Council of America v. EPA*, 553 F.3d 927 (6th Cir. 2009). As a result of the Court's decision to vacate the 2006 NPDES Pesticides Rule, NPDES permits are required for discharges of biological pesticides and of chemical pesticides that leave a residue, to waters of the United States. In response to this decision, on April 9, 2009, the EPA requested a two-year stay of the mandate to provide the Agency time to develop general permits, to assist NPDES-authorized states to develop their NPDES permits, and to provide outreach and education to the regulated community. On June 8, 2009, the Sixth Circuit granted the EPA the two-year stay of the mandate. On March 28, 2011, the U.S. Court of Appeals for the Sixth Circuit granted the EPA's request for an extension to allow more time for pesticide operators to obtain permits for pesticide discharges into U.S. waters. The court's decision extended the deadline for when permits would be required from April 9, 2011 to October 31, 2011.

EPA proposed a draft pesticide general permit on June 4, 2010, to cover certain discharges resulting from pesticide applications. The EPA Regional offices and State NPDES authorities may issue additional general permits or individual permits, if needed. On October 31, 2011, the EPA issued the final NPDES Pesticide General Permit (PGP) for Discharges from the Application of Pesticides. South Carolina issued a PGP, SCG160000, in 2011 and the permit expired in March 2016. DHEC reissued their PGP for another five years on March 22, 2016 and the permit is effective until March 31, 2021. South Carolina has a permit similar to EPA's PGP since EPA's permit was not applicable in South Carolina. There are no facilities in South Carolina covered under an individual pesticides permit.

### *Program Strengths:*

The South Carolina PGP, like the EPA permit, covers operators that apply pesticides that result in discharges from the following pesticide use patterns: 1) mosquito and other flying insect pest control; 2) weed and algae control; 3) animal pest control; and 4) forest canopy pest control. Region 4 reviewed South Carolina's PGP with a focus on verifying its consistency with NPDES program requirements. It was found that this permit meets the requirements to obtain coverage for all discharges from the application of pesticides. The review found that the permit was consistent with CWA requirements.

*Critical Findings:* None.

### *3. Pretreatment*

#### *Background*

The general pretreatment regulations (40 CFR 403) establish responsibilities of federal, state, and local government, industry and the public to implement pretreatment standards to control pollutants from industrial users which may cause pass through or interfere with POTW treatment processes or which may contaminate sewage sludge.

The goal of a pretreatment program review is to assess the status of the pretreatment program in South Carolina, as well as assess specific language in POTW NPDES permits. With respect to NPDES permits, focus is placed on the following regulatory requirements for pretreatment activities and pretreatment programs:

- 40 CFR 122.42(b) (POTW requirements to notify Director of new pollutants or change in discharge);
- 40 CFR 122.44(j) (Pretreatment Programs for POTWs);
- 40 CFR 403.8 (Pretreatment Program Requirements: Development and Implementation by POTW);
- 40 CFR 403.9 (POTW Pretreatment Program and/or Authorization to revise Pretreatment Standards: Submission for Approval);
- 40 CFR 403.12(i) (Annual POTW Reports); and
- 40 CFR 403.18 (Modification of POTW Pretreatment Program).

The EPA Region 4 industrial pretreatment program routinely performs comprehensive audits of the state's permitting, compliance, and enforcement activities to assure consistency with the Clean Water Act, state law, the Memorandum of Agreement (MOA), the state grant workplan and all applicable federal regulations.

Comprehensive State Pretreatment Program Audits (CSPPA) include: (1) on-site visits to all appropriate state offices, including central and field offices; (2) compliance oversight visits to a statistically significant percentage of public utility (i.e., POTW) pretreatment programs and, if appropriate, state-controlled significant industrial users; and (3) a desk audit of the legal authorities, formal procedures, and resources available to the state's industrial pretreatment program.

#### *Program Strengths:*

Since the CSPPA takes a more comprehensive look at the pretreatment program, the EPA's evaluation of the state's pretreatment permitting activities will be included in the CSPPA report provided separately to the State Director. The EPA will notify the State pretreatment program director prior to conducting the next CSPPA.

*Critical Findings:* None.

## 4. Stormwater

### *Background*

DHEC issues an industrial stormwater general permit authorizing all new and existing stormwater point sources within South Carolina to discharge stormwater associated with industrial activity, excluding construction, to waters of the State. South Carolina's industrial stormwater general permit (IGP) is modeled after the EPA's Multi-Sector General NPDES Permit (MSGP) for industrial stormwater, issued on June 04, 2015. Many of the benchmark values and recommended procedures, practices, control measures and Best Management Practices (BMP) in DHEC's IGP are based principally on EPA's MSGP.

### *Program Strengths:*

Region 4 reviewed DHEC's IGP with a focus on verifying its consistency with NPDES program requirements. The review found that this permit meets the federal requirements to obtain coverage for all stormwater related discharges associated with industrial activities. Some of the highlights of the IGP are as follows:

- The IGP has 27 specific industrial sectors and some are required to conduct annual analytical sampling;
- The IGP contains benchmark values and facilities can generate their own; however, these are not considered effluent limits and exceeding a benchmark is not a permit violation;
- At least once during the term of the IGP, permittees must conduct a dye, smoke, or equivalent test to evaluate the presence of non-stormwater discharges into the storm sewer system, where applicable;
- If there is an exceedance of a benchmark value, the permittee is required to make modifications of BMPs and sample each subsequent quarter until the benchmark is met or make the determination that no further pollutant reductions are technologically available and economically practicable. If the facility passes the benchmark sampling requirement, it will be required to sample bi-annually for the pollutant of concern;
- If there is an exceedance of a numeric effluent limit, the IGP requires the permittee to conduct corrective action and follow-up monitoring which is to continue, at least quarterly, until the discharge is in compliance;
- The IGP requires the permittee to regularly review and refine their BMPs to reduce pollutants to the maximum extent practicable; and
- The IGP has additional requirements for dischargers to all impaired waters identified on the South Carolina 305(b)/303(d) list, including monitoring for appropriate parameters and corrective action if the discharge exceeds the benchmark value for the pollutant of concern.

*Critical Findings:* None.

## *Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s)*

### *Background*

The NPDES program requires stormwater discharges from certain MS4s, industrial activities, and construction sites to be permitted. Generally, the EPA and NPDES-authorized states issue individual permits for medium and large MS4s and general permits for smaller MS4s, industrial activities, and construction activities. The EPA Region 4 staff reviews all draft MS4 and construction permits as per the MOA with the State of South Carolina. EPA Region 4 makes its official comments and recommendations about permit quality during these reviews.

South Carolina's permits require permittees to develop and implement a storm water management program that includes the six minimum control measures, evaluation/assessment and reporting efforts, and recordkeeping. MS4s are required to design a storm water management program that:

- Reduces the discharge of pollutants to the "maximum extent practicable" (MEP);
- Protects water quality; and
- Satisfies the appropriate water quality requirements of the Clean Water Act.

MEP is the standard that establishes the level of pollutant reductions that MS4 operators must achieve through implementation of a storm water management program. The strategies used to reduce pollutants to the MEP may be different for each MS4 because of unique local hydrologic, geologic, and water quality concerns in different areas.

As part of the PQR, EPA reviewed several MS4 permits applicable to all Phase I and Phase II communities, the construction stormwater general permit and the industrial stormwater general permit (SCR000000). Phase I MS4 communities are issued individual MS4 permits while Phase II MS4 communities are regulated under a general permit (SCR030000). In 2016, there were 4 Phase I MS4 communities covered under individual permits and over 70 communities covered under the Phase II MS4 general permit.

**Phase 1 MS4s:** There are 4 Phase I MS4s within the State of South Carolina. Under the Phase I MS4 program, regulated communities are required to develop comprehensive stormwater management programs that, at a minimum, address the following:

- Structural control maintenance;
- Areas of significant development or redevelopment;
- Roadway runoff management;
- Flood control related to water quality issues;
- Municipal owned operations such as landfills, wastewater treatment plants, etc.;
- Hazardous waste treatment, storage or disposal sites, etc.;
- Application of pesticides, herbicides, and fertilizers;
- Illicit discharge detection and elimination;
- Regulation of sites as classified as associated with industrial activity;

- Construction and post-construction site runoff control; and
- Public education and outreach.

MS4s have coordinated technical assistance and information exchange via a host of networks, including the South Carolina Association of Storm Water Managers (SCASM), Clemson University Extension Service, and various quasi-governmental entities. Some South Carolina MS4's have adopted stormwater utilities to provide funding for their stormwater management program.

The Phase I MS4 permits issued by DHEC contain all the required core Phase I elements including the development of the Stormwater Management Program (SWMP). The SWMP is routinely updated as required by the permit. Development of new content in the SWMP based on permit directives are completed based on timetables established within the permit.

**Phase II MS4s:** There are over 70 Phase II MS4s within the State of South Carolina covered under the MS4 general permit. Under the Phase II MS4 program communities, are responsible for developing and implementing a local stormwater management programs by requiring the SWMP to consist primarily of six “minimum control measures.” These measures are the following:

- Public education and outreach
- Public participation/ involvement
- Illicit discharge detection and elimination
- Construction site runoff control
- Post-construction site runoff control
- Pollution prevention/ good housekeeping.

#### *Program Strengths:*

Upon reissuance, Region 4 staff reviews all MS4 permits to ascertain permit adherence to federal MS4 requirements. The State of South Carolina’s overall administration of the NPDES stormwater program and its permits continue to meet EPA’s expectations. DHEC’s MS4 permits are some of the most comprehensive permits issued in Region 4. DHEC staff are proactive in keeping MS4s informed and up to date on State and federal initiatives/policies. Plans and annual reports are extensively reviewed and updated as necessary. The State is constantly working towards initiatives and permit policy consistent with adaptive management practices protective of state water quality concerns relating to stormwater. However, due to staff shortages and resource constraints, several MS4 permits are administratively continued.

Additionally, it should be noted that DHEC is required by the South Carolina Coastal Zone Management Act to review all applicable state and federal permit applications for activities within the eight county coastal zone for consistency with the State's Coastal Zone Management Plan (SCCZMP). The South Carolina Coastal Zone Program document contains the specific goals,



objectives and policies necessary for staff review of development activities taking place in the eight coastal counties. It also contains the basic procedures involved in the management of specific coastal resources, such as endangered species and archeological and historical resources, as well as procedures for dock master plans and wetland master plans.

*Recommendations:*

The Phase I and Phase II MS4 permits are extensive and provide solid requirements for MS4 program development and implementation. However, as noted earlier, resource and staff shortages continue to present a challenge in the reissuance of Phase 1 MS4 permits on a timely basis. DHEC must continue to re-direct resources as necessary to ensure that permit backlog is minimized.

*Critical Findings:* None.

## **IV. REGIONAL TOPIC AREA FINDINGS**

### **A. Implementation of TMDLs**

*Background*

A TMDL is a calculation of the maximum quantity of a pollutant that may be added to a waterbody from all sources, without exceeding its applicable WQS. States must establish TMDLs for all impairing pollutants – pollutants that prevent waters from attaining WQS after implementing applicable technology-based requirements. Where a TMDL has been established for a waterbody, WQBELs must be consistent with the assumptions and requirements of any wasteload allocation (WLA) for point source dischargers.

From the PQR discussion with staff it is understood that currently, over 400 sites or stations are covered under a TMDL developed in South Carolina and are approved by USEPA Region 4. Of those, approximately 350 of these approved TMDLs are for fecal coliform bacteria. The complete list of sites covered under TMDLs and whether the sites are meeting water quality standards for the pollutant of concern may be found on the states' web site for TMDLs. In addition, DHEC is currently developing TMDLs for other sites that are impaired for fecal coliform bacteria in fresh waters, fecal coliform bacteria in shellfish harvesting waters, and nutrients in lakes.

The focus of the TMDL review during the PQR was to verify that final TMDL requirements applicable to point sources are being implemented in NPDES permits. As part of the PQR, EPA reviewed 13 permit records for TMDL implementation.

*Program Strengths:*

DHEC includes implementation plans for each TMDL and these plans are available on DHEC's website. The purpose of the implementation plan is to identify the actions that must be taken to decrease the pollutants of concern from entering the stream with the goal of improving water quality and better enabling the waterbody to meet state WQS. The TMDL

implementation plans concentrate on educating the public about non-point sources of water pollution and encouraging the use of best management practices at the agriculture, forestry, and urban and residential levels to reduce non-point source pollution. The implementation plans document the public participation process used to define the issues and resolve any local concerns regarding specific sources of pollution contributing to the water quality impairment.

*Critical Findings:* None.

## **B. Whole Effluent Toxicity (WET)**

### *Background*

Regulations at 40 CFR 122.44(d) require several factors to be considered when determining reasonable potential for whole effluent toxicity (WET). Among these factors, WET monitoring data used should be representative of the effluent discharge and consideration of species sensitivity, as well as ensuring that effluent variability is considered and addressed. State standards specify WET testing species (R.61-68). 40 CFR 122.48(b) requires permits to establish monitoring requirements to yield data representative of the monitored activity, and 40 CFR 122.44(i)(I) requires that monitoring requirements ensure compliance with permit limitations. Monitoring frequencies are based on the nature of the facility, similar facilities and, if applicable, existing and/or previous permit's monitoring results or compliance history. DHEC clarified that they do require four tests sets using two species for the application for permit to be complete. At a minimum, major municipal facilities perform these tests on a quarterly basis. Industrial facilities are only required to submit one test result with two species.

As part of the PQR, EPA reviewed five permits and their rationales to evaluate whether the permits adequately and correctly implemented the state's WET procedures.

The municipal permits reviewed usually include chronic WET testing requirements, which are run to the sublethal end point. SC0046345 includes acute testing as well, but the numeric limit is not stated in the limits table where other chemical specific limits appear, rather it is placed elsewhere in the permit. One of the permits (SC0048526) does not require WET testing because it is for a reverse-osmosis drinking water facility. Two of the non-municipal permits include chronic WET monitoring as warranted.

### *Program Strengths:*

The review demonstrated that the majority of the permits require the use of both species, and include either acute or chronic toxicity monitoring requirements.

*Critical Findings:* None.

### *Suggested Practice:*

Consider placing the WET limit requirements in the effluent limits table. Include a more thorough description of the dilutions required to complete the WET tests.

## C. Resource Extraction

### *Background*

EPA Region 4 has identified the resource extraction industry as a primary industrial area contributing pollutants and causing impairments to water bodies in the Southeast. Resource extraction operations in Region 4 include coal mining, mineral mining (i.e. bauxite clay, industrial sand, kaolin, limestone, phosphate, sand and gravel), and metal mining (i.e., aluminum, gold, and zinc). Conventional underground and surface mining techniques account for most of the resource extraction mining activities. The extraction and beneficiation of these resources can lead to the generation of large quantities of waste. These waste streams include mine waste and process water, storm water, waste rock, tailings, and overburden.

Sediments, toxic metals, acid mine drainage, and in some cases nutrients, are the primary pollutants associated with resource extraction discharges. The volume of water discharged is dependent on site-specific conditions, including temporary wastewater storage, rainfall, and evaporation rates; however, effluent flow rates from some mines and processing facilities can be significant.

The focus of the resource extraction permit review is to verify that permits and fact sheets appropriately address these and other issues associated with this industry. With that goal in mind, two permits were reviewed.

Permit number SC0041378 expired in 2015. This permit was established for an existing, non-major, precious metals (gold) mining facility that has since ceased operations, but nothing was initially found in the record to indicate re-application for permit was made, nor request for permit termination. Subsequently, it was determined that a renewal application was at DHEC in a different location and their data management system did properly reflect that the permit had been administratively continued. Reclamation activities were indicated in the permit fact sheet and a closure plan for the site was mentioned.

The only TBEL and/or WQBEL limit in the permit was for pH at one external outfall (003), which was established for “run-off” discharges from the site. Two internal monitoring points (03A and 03B) are included in the permit for monitoring heavy metals discharges of cyanide identified as Weak Acid Dissociable or WAD-cyanide, and/or Free, or total cyanide in the leachate from two drains to outfall 003. The permit mentions a “centralized wastewater treatment (CWT) system that includes application of slaked lime (calcium hydroxide) or soda (sodium hydroxide) addition to adjust the pH of water prior to discharge to the North Lake Pit (assumed Outfall 003). The permit also includes annual monitoring for 12 groundwater monitoring wells.

EPA’s further research into the CWT process at the facility finds that this application is to ensure that acidity of the waste stream is maintained over pH 10.5. At gold plants, it is possible that other species of cyanide may remain in tailings streams, which are potentially toxic. However,

DMR data reviewed during the permit reissuance indicated that there were no detections of WAD, free and total cyanide at internal outfalls. This could have been better documented in the rationale. Other processes that may be applied to reduce cyanide to cyanate, a less toxic parameter, can release higher levels of ammonia and mercury. However, this facility no longer has a cyanide destruction process, therefore, ammonia should not be generated. Mercury was evaluated at the final outfall; however, there was no reasonable potential. Although, this could have been better documented in the rationale.

Permit number SC0045811 was recently reissued for the “tailings pond” drainage, and the permit rationale indicated the site is operational. The only numeric limitations found in the permit were for pH and TSS. Reasonable potential was indicated for Nickel and Aluminum (monthly average only), however, the permit rationale did not include effluent limits for these metals because a [reported] discharge had occurred only once in the previous 5-year permit cycle. The state determined no reasonable potential for the daily maximum of these parameters. Because the discharge was not continuous, the permit writer set limits based on the daily maximum only per State Regulations R.61-9.122.45(e), (same as 40 CFR 122.45(e)). There was no indication of there being any available background data to use.

#### *Program Strengths:*

Region 4 reviewed two resource extraction permits with a focus on verifying consistency with NPDES program requirements. The state evaluates the reasonable potential of the discharges to cause or contribute to an exceedance of a WQS and when appropriate assigns limits to specific parameters. The permits reviewed were consistent with NPDES program requirements.

*Critical Findings:* None.

## **V. ACTION ITEMS**

This section provides a summary of the main findings of the review and provides proposed action items to improve South Carolina’s NPDES permit programs. This list of proposed action items will serve as the basis for ongoing discussions between EPA Region 4 and DHEC, as well as between Region 4 and EPA HQ. These discussions should focus on eliminating program deficiencies to improve performance by enabling good quality, defensible permits issued in a timely fashion.

The proposed action items are divided into three categories to identify the priority that should be placed on each Item and facilitate discussions between Regions and states.

- **Critical Findings** (Category One) - Most Significant: Proposed action items will address a current deficiency or noncompliance with respect to a federal regulation.
- **Recommended Actions** (Category Two) - Recommended: Proposed action items will address a current deficiency with respect to EPA guidance or policy.

- **Suggested Practices** (Category Three) - Suggested: Proposed action items are listed as recommendations to increase the effectiveness of the State’s or Region’s NPDES permit program.

The critical findings and recommended actions proposed should be used to augment the existing list of “follow up actions” currently established as an indicator performance measure and tracked under EPA’s Strategic Plan Water Quality Goals or may serve as a roadmap for modifications to the Region’s program management.

## **A. Basic Facility Information and Permit Application**

Overall, the cover page and basic facility and receiving waterbody information provided in the core permit fact sheets and rationales is clear and complete. Similarly, proper permit application forms were identified in the files and these forms include required information and data. Proposed action items to help DHEC strengthen its NPDES permit program include the following:

- Include additional description of municipal facilities in rationales, including basic information regarding the treatment process employed. (Category 2).
- Include outfall identifier (i.e. 001), and location information, (Latitude/Longitude), in the permits. (Category 2).
- Describe the actual designated uses of the receiving water in the rationale, not just the alphabetical acronym. (Category 3).

## **B. Technology-based Effluent Limitations**

Municipal facility permits reviewed include limits that are as stringent, or more stringent, than those required by secondary treatment. Non-municipal facilities also implement facility specific ELGs where applicable and BPJ-based limits where appropriate, as well as other limits based on conditions and state regulations. Proposed action items to help DHEC strengthen its NPDES permit program include the following:

- Ensure that rationales explain the facility characterization process (how the applicability of ELGs is determined) and, where applicable, how performance levels are determined. (Category 2).
- In the rationale, identify the wasteload allocation worksheet as part of the documentation for water quality-based requirements. (Category 2).

## **C. Water Quality-Based Effluent Limitations**

The process for evaluating and developing WQBELs is clear, well documented, and appears consistent with federal guidance. Pollutants of concern are easy to identify, water quality spreadsheets including effluent data, reasonable potential, and limits, are clear and part of the files, as are wasteload allocation worksheets, and WET requirements appear to be consistently implemented. Proposed action items to help DHEC strengthen its NPDES permit program include the following:

- In the rationale, identify the wasteload allocation worksheet as part of the documentation for water quality-based requirements. (Category 2).
- Consider ways in which rationales can include more site specific information applicable to the permitted facility and not just by reference. (Category 2).

#### **D. Monitoring and Reporting**

Monitoring requirements in the permits reviewed appeared sufficient to assess compliance with effluent limitations. Proposed action items to help DHEC strengthen its NPDES permit program include the following:

- Because the deadline to adopt the rule for Sufficiently Sensitive Methods expired September 18, 2016, South Carolina should adopt the federal regulation requirements by their proposed completion date of December 2017. Pursuant to 40 CFR 136. (Category 1).

#### **E. Standard and Special Conditions**

- There are no proposed action items for this topic area.

#### **F. Administrative Process (including public notice)**

The permit files reviewed include documentation of permit public notices. Public comments and responses were identified in one permit file but were not identified for most of the core permits reviewed. Proposed action items to help DHEC strengthen its NPDES permit program include the following:

- The state should update the permit rating sheet anytime a facility submits an application with reduced production rates, pursuant to 40 CFR 122.44. (Category 2).
- Include documentation in an addendum to the permit rationale noting whether, or not, any public comments were received and whether a hearing was conducted. (Category 3).

#### **G. Documentation (including fact sheet)**

Overall, the permits reviewed were well documented in the fact sheets, detailed permit rationales, and permit files. Proposed action items to help DHEC strengthen its NPDES permit program include the following:

- In reissued permits with new or increased loadings, provide a better explanation in the permit or fact sheet detailing how antidegradation requirements are addressed pursuant to 40 CFR § 121.44(l). (Category 2).
- Where discharge limits are carried forward from a prior permit, recognizing that the rationale referred to the application, ensure that the basis for current limits is clear, including compliance with anti-backsliding. (Category 2).
- Where multiple flow conditions are included in the rationale for an upgrade of a POTW, or where operational fluctuations are indicated for variable production at industrial

facilities, tiered limits are suggested. Clarify in the permit how facility should make notification to the state of these changes and identify any approval authority procedures. (Category 2).

- While generic examples of limit calculations are helpful, the rationales should reflect the actual calculations made to establish final permit limitations. (Category 3).

## H. National Topic Areas

Proposed actions items for core topic areas are provided below.

### 1. *Nutrients*

- There are no proposed action items for this topic area.

### 2. *Pesticides*

- There are no proposed action items for this topic area.

### 3. *Pretreatment*

- There are no proposed action items for this topic area.

### 4. *Stormwater*

- There are no proposed action items for this topic area.

## I. Regional Topic Areas

Proposed action items for special focus areas are provided below.

### 1. *Implementation of TMDLs*

- There are no proposed action items for this topic area.

### 2. *Whole Effluent Toxicity (WET)*

The municipal permits reviewed generally include chronic WET testing requirements and the use of two species.

Proposed action item to strengthen DHEC's NPDES permit program includes the following:

- Consider placing the WET limit requirements in the effluent limits table of the permit. Include a more thorough description of the dilutions required to complete the WET tests in the permit. (Category 3).

### 3. *Resource Extraction*

Proposed action item to strengthen DHEC's NPDES permit program includes the following:

- Current closure plans should be included or referenced in the NPDES permits. (Category 3).