John K. Durkee, P.E.
Environmental Engineering Sciences, LLC
1226 White Tail Path
Charleston, SC 29414
Phone: 843-214-0663
Fax: 843-573-0563
Email: e2sciences@bellsouth.net
Website: www.e2sciences.com

Extended Abstract

The Increasing Impact of 303(d) Stream Impairments on NPDES Permit Limits

The South Carolina Department of Health and Environmental Control (DHEC) monitors instream water quality throughout South Carolina, and the number of 303(d) stream impairments continues to rise as analytical detection levels and state instream water quality criteria get lower. At the same time, DHEC and the EPA continue to tighten their approach to limiting an NPDES discharger that "contributes to" a downstream impairment. Language within state regulations *R.61-68, Water Classifications & Standards* (R.61-68), *Water Pollution Control Permits: R.61-9*, and the forthcoming renewal of the *NPDES General Permit for Storm Water Discharges Associated with Industrial Activity (IGP)*, as well as the Department's implementation of the state regulations, is leading to tighter NPDES permit conditions and limitations for permittees.

The state 303(d) list is a list of waterbodies that do not meet water quality standards (are impaired) that is submitted to EPA every two years, and the primary regulation that drives the listing/delisting process in South Carolina is R.61-68. This regulation includes, among other things, standards that all surface waters (freshwaters, salt waters, trout waters, etc.) and ground waters must achieve, and these may be narrative or numeric standards. All numeric criteria for the protection of aquatic life and human health for priority toxic pollutants (metals, volatiles, semi-volatiles, pesticides, herbicides, and others) are listed as an appendix to R.61-68. When DHEC monitors the state's waters and determines whether or not the waterbody is impaired, the data are compared to these standards.

DHEC's ambient water quality monitoring program collects and analyzes the data needed to make water quality management decisions, and the data is used to:

- Assess water quality status and identify waters not meeting standards – 303(d) list, 305(b) report, watershed water quality assessments (WWQA)
- Determine long-term trends in specific constituents at individual sites
- Collect data for Wasteload Allocation Models
- Support specific NPDES permit limits
- Evaluate the effectiveness of other DHEC programs

Monitoring in South Carolina consists primarily of: 1) Physical and Chemical (water column), 2) Biological (macroinvertibrate), and 3) Fish Tissue testing at about 2,300 sites across South Carolina. Physical and chemical monitoring is the primary type, and it is performed at stations under two "networks." Base fixed monitoring is performed bi-monthly, year-round, every year to assess long-term trends at a network of sites that ensures consistent statewide coverage. In 2002, DHEC began performing "probability-based monitoring" at random sites across the state. Each site includes one year of monthly data, and the data is used to identify new 303(d) candidates as well as to enhance the ability

to make statistically valid inferences about large watershed areas based on a limited number of sampling stations.

Every two years, DHEC uses the data to assess the state's waters against designated aquatic life, recreational, human consumptive, and shellfish harvesting uses. The 303(d) list is compiled using five years of data (e.g. for the 2008 list, data from 2002-2006 was used). NOTE: Less current data may still be the basis for listing previous 303(d) sites where no new data was collected. An assessment methodology is developed and approved by EPA Region 4 and is used to assess the data for 303(d) list development. The primary listing assessments include aquatic life (based on the percentage of criteria excursions), recreational use support (whether or not the swimmable goal of the Clean Water Act is attained based on the frequency of fecal coliform excursions), and fish consumption (an advisory for mercury or PCB's indicates non-support).

During this two-year review, the state also determines whether sites should be delisted. Once a site has been added to the 303(d) list, there are only three ways for it to be removed/delisted:

- A listing error has been identified.
- The SC water quality standard has been attained – i.e., the most recent data and information indicate that water quality standard is being met.
- A TMDL has been developed and approved. TMDLs must be developed and approved by EPA for all sites listed on the 303(d) list unless they are removed for one of the two reasons above. Note that a developed and approved TMDL may not mean that the site/station has attained the water quality standards.

Waterbodies that appeared on the previous 303(d) list that do not meet the above justifications for delisting remain on the current 303(d) list.

Once the waters downstream from an NPDES discharger are listed as impaired, how can this impact the permittee? First, NPDES permit limits are based on the most stringent of all factors including technology-based (federal effluent guidelines, secondary treatment standards, best professional judgment, etc.) and water quality-based (typically based on the aquatic life or human health criteria in R.61-68). Most new NPDES permit limits are water quality-based due to limited instream assimilative capacity, new or lower state-adopted criteria or analytical practical quantitation levels (PQL's), or downstream water quality impairments. The permit engineer must consider any downstream impairment of the receiving stream when developing the permit limitations, and new, additional, or more restrictive discharge limits will be required if the state determines that the discharge "contributes" to the impairment.

While there is no actual definition for "contributing to" an impairment, there are many uses of this term within state regulation and NPDES permits. Examples include:

> No new NPDES permit may be issued "…if the discharge from its construction or operation will cause or contribute to the violation of water quality standards." *R.61-9.122.4(i)*
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> Permits must contain limits when pollutants "…may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." *R.61-9.122.44(d)(1)*

> "A discharge may be determined to contribute to an excursion of a water quality criterion when the waterbody is impaired (e.g., on the 303(d) list) for the parameter of concern and that parameter is also being discharged at levels above the water quality criterion." *NPDES Permit Rationale Language*
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> New discharges to impaired waters are not eligible for permit coverage unless applicants "…prepare data to support a showing that the discharge is not expected to cause or contribute to an exceedance of a water quality standard…" *Proposed IGP Part 1.1.4.7.c*

When determining future NPDES permit limits upstream of an impairment, state and federal policies can often lead to conservative assumptions and permit limitations, and complicating factors make it difficult to negotiate permit limits that consider the discharge's relative contribution to the impairment. While many impairments (fecal, turbidity, metals) likely result from sampling performed during storm events, permit limitations are developed based on conservative, low-flow conditions. In addition, in cases where a state Total Maximum Daily Load (TMDL) has not been developed and the source(s) of the impairment is unknown, permit limitations often do not allow for available instream dilution, thereby requiring the instream criteria to be met at the dischargers' pipe rather than instream. EPA has also acknowledged that most turbidity impairments are the result of non-point sources, but to ensure that dischargers do not "contribute to" turbidity impairments, they have indicated that upstream discharges may not be allowed total suspended solids (TSS) increases and their permits may include turbidity limits. In addition, due to state budget shortfalls, DHEC has significantly reduced their monitoring sites by one-third, and this may result in listed sites not being delisted until new information becomes available, likely funded by permittees.

The purpose of this presentation is to provide background information regarding the 303(d) and NPDES permitting programs, to list several examples where permitting policies may be too conservative when considering contributions to impairments prior to the issuance of TMDL's, and to initiate a dialogue between regulators and permittees in the hope of finding an amenable solution. Potential suggested solutions to be discussed may include:

- Not adopting criteria into R.61-68 unless necessary (ex., the removal of iron and manganese).
- Issuing more TMDL's (listed sources "contribute" and others do not).
- Determine a discharge's "relative contribution" at 7Q10 flows based on the 303(d) data and a (pre-TMDL) load-duration curve to discount small contributions and exclude permit restrictions.
- Streamline permittee monitoring at DHEC sites and other instream locations to potentially delist inactive sites, or stream reaches, and to determine an initial list of actual relative contributors *(refer to DHEC guidance, "Outside Data and Quality Assurance Requirements, January 2010").*
- Potential expiration of 303(d) listings if the data is determined not to be representative of current conditions (primarily probability sites).
- Additional language in regulations and permits such as "natural background pollutant levels" (as included within the IGP), de minimus terminology, and/or reword/insert language regarding the restriction of available dilution where downstream impairments exist within regulations and permits.
- Other potential solutions???