

***Receiving Waters Monitoring Work Plan Guidance
for the CSO Program***

March, 2015

Background

In accordance with the United States Environmental Protection Agency's (USEPA's) Combined Sewer Overflow (CSO) Control Policy and the requirements of the New Jersey Pollutant Discharge Elimination System (NJPDDES) CSO permit, a CSO permittee shall prepare and submit ambient water quality data to satisfy the two Long Term Control Plan (LTCP) study requirements - System Characterization Report and baseline Compliance Monitoring Program (CMP) report. Although the purpose of these two study requirements in the permit is different, there is some overlap relating to the ambient monitoring requirements to develop and implement a baseline water quality monitoring plan. This ambient data will be used in the System Characterization Report to determine the baseline conditions upon which the LTCP will be developed and it will also be used for the CMP to establish the baseline ambient quality for later comparison to subsequent ambient monitoring events to CMP Report to determine baseline conditions in order assess attainment of water quality standards (WQS) and designated uses, This baseline data will also be used for comparison against future CMP monitoring events during and after LTCP implementation to determine the effectiveness of CSO controls.

This guidance is intended to provide permittees with an outline of the receiving water monitoring elements required to satisfy state and federal CSO requirements. And, to provide permittees with links to EPA's CSO documents that contain guidance on how such monitoring should be performed. Over the past several decades, EPA published numerous CSO documents¹ e.g., Combined Sewer Overflows Guidance for Monitoring and Modeling (EPA 832-B-99-002), Combined Sewer Overflows Guidance for Long-Term Control Plan (EPA 832-B-95-002), CSO

¹ A full list of EPA's CSO documents can be found at:
<http://water.epa.gov/polwaste/wastewater/StormwaterPubs.cfm>

Post Construction Compliance Monitoring Guidance (EPA-833-K-11-001) and Combined Sewer Overflow (CSO) Control Policy (April 19, 1994).

Permittees are required to develop and finalize their CSO receiving waters monitoring work plans in accordance with the NJPDES permit. These work plans should be developed in accordance with the USEPA's CSO guidance documents, as listed above. The Department is available to meet with permittees to provide additional guidance as necessary. It is important that applicants consult with the Department prior to developing the work plans to ensure that the work plans encompasses all the required elements of the monitoring project. Receiving water monitoring shall be conducted before, during and after implementing the CSO control measures. Permittees must receive a formal work plan approval letter – approved Quality Assurance Project Plan (QAPP) - from the Department prior to initiating their proposed characterization studies.

Receiving Water Monitoring Goals

The goals of receiving water monitoring should include the following:²

- 1. Assess attainment of water quality standards (WQS) including designated uses.** Identification of the applicable surface water quality criteria under N.J.A.C. 7:9B-1.14 of the New Jersey Surface Water Quality Standards (SWQS), and whether the waterbody is attaining or has ever attained these WQS. Permittees are expected to review New Jersey's Integrated Reports: the Integrated List of Waters ("305(b) Report") which identifies the Use Assessment results for some of the affected waterbodies, and the List of Water Quality Limited Waters ("303(d) List") to identify which pollutants are in exceedance of the applicable surface water quality standards (SWQS) in the CSO-impacted receiving waters.
- 2. Define the baseline conditions in the receiving water.** For the purpose of this monitoring effort, at a minimum, receiving waters baseline conditions will be established in terms of pathogens concentrations under dry and wet weather conditions. The Department has determined that the presence of pathogens is an appropriate indicator of the presence of other parameters of concern that discharge from CSOs. Wet weather conditions should encompass

² Page 4-24, Guidance for Monitoring and Modeling, (EPA 832-B-99-002)

varying antecedent dry periods so that variations in pollutant loading into the system can be assessed.

3. **Assess the relative impacts of CSOs on the water quality of receiving water.** The relative impacts can be evaluated through appropriate ambient sampling design and the CSO discharge characteristics obtained from the CSO discharge characterization studies. Depending on the complexity of the impacted waterbody, water quality data analysis could be accomplished by using a range of models of varying complexity.
4. **Gain sufficient understanding of the receiving water in order to support evaluation of proposed CSO control alternatives.** Knowledge of the hydraulic characteristics of the receiving waterbody, the ambient water quality and CSO loading characteristics of the system are necessary to when conducting evaluation of proposed CSO controls.
5. **Support the review and revision, as appropriate, of water quality standards.** A key principle of the National CSO Policy is the “review and revision, as appropriate, of water quality standards (WQS) and their implementation procedures when developing CSO control plans to reflect the site-specific wet weather impacts of CSOs.” The appropriate timing for conducting such “review and revision” is after the effect of CSO abatement measures on water quality has been evaluated through water quality monitoring and modeling and/or after significant portions of the LTCP has been implemented. For guidance on how to integrate development of CSO control plans with review of water quality standards, Permittees are encourage to review EPA’s document “Guidance: Coordinating CSO Long-Term Planning with Water Quality Standards Reviews”³

Access to Data

For the purpose of establishing a baseline condition prior to implementation of CSO control, permittees are encouraged to use any existing data that can fulfill this monitoring task and ensure it can be compared with the subsequent CSO CMP monitoring requirements during and after

³ Documents can be found at:

http://water.epa.gov/scitech/swguidance/standards/handbook/upload/2001_08_06_pubs_wqs_guide_final.pdf

final LTCP implementation. For example, the water quality data that has been collected by various organizations as noted below may satisfy some of the ambient monitoring requirements of the CSO permits.

- The New Jersey Harbor Dischargers Group Monitoring Network
- The Interstate Environmental Commission (IEC)
- Meadowlands Environmental Research Institute (MERI)
- New Jersey Bureau of Freshwater & Biological Monitoring
- New Jersey Bureau of Marine Water Monitoring
- U.S. Geological Survey - National Water Information System (USGS- NWIS)
- NY/NJ Harbor Estuary Program – Harbor Survey
- Delaware River Basin Commission (DRBC)
- Special studies, e.g., data collected as part of TMDL studies, CSS characterization studies

The permittees will be responsible for compiling and analyzing all existing data/information for submittals to the Department and ensuring that the data meets the State Quality Assurance Program requirements.

Monitoring Protocols and Parameters

For the purpose of establishing baseline water quality conditions of the CSO receiving waterbody, existing data and/or proposed future sampling based on site specific conditions and in cooperation with the Department, should meet the following protocols and parameters unless specific site conditions warrant modifications ⁴:

- 1- **Monitoring Locations:** A sufficient number of appropriate monitoring stations are required to ensure acceptable spatial coverage of the studied area. For example, proper near and far-field stations; the selection of appropriate locations depends on the characteristics of the

⁴ For in-depth discussions of these monitoring requirements, permittees are expected to review EPA's documents: page 49 thru 77 of the CSO Post Construction Compliance Monitoring Guidance; Ch.6 of the Combined Sewer Overflows Guidance for Monitoring and Modeling. Both documents can be found at: <http://water.epa.gov/polwaste/wastewater/StormwaterPubs.cfm>

receiving water - monitoring tidally-influenced waterbodies is more resource intensive than simple non-tidal riverine systems. The number and placement of sampling locations also depends on the size of the water body, the horizontal and vertical variability in the water body, and the degree of resolution necessary to assess attainment of WQS.

- 2- **Sampling frequency and extent of monitoring:** Sampling frequency and extent of monitoring should provide temporal coverage necessary to describe seasonal variations, proper assessment of WQS and define variations in pollutant loading for the system. Monitoring studies should target seasons, flow regimes, and other critical environmental conditions where CSOs have the greatest potential for impacts. To assess the impact of wet weather runoff, the water quality of receiving waters during average dry weather periods should be known. Water quality data collected during dry weather conditions provide a basis of comparison to data collected during wet weather conditions. Sampling several events with varying antecedent dry periods will help define the variations in pollutant loading. The minimum sampling frequency required to ensure acceptable temporal coverage is fifteen (15) sampling events taken during dry and wet weather conditions - a total of five dry and ten wet weather sampling events for each monitoring station. Sampling sites will be determined by the permittee and will be subject to final approval by the Department after conducting a site visit. In general, dry-weather events are characterized as being preceded by a 72-hour period with no measurable rainfall (less than 0.1 inch rainfall). Note that in defining a dry-weather event, permittees should evaluate the duration of an overflow after rainfall has ceased. Wet-weather events are generally characterized as storm events that are greater than 0.1 inch and at least 72 hours from the previously measurable storm event. Permittees should also collect wet weather samples (10 sampling events) such that samples can be used to differentiate between “wet-weather conditions under which a CSO is not expected to occur” (5 sampling events) vs. “wet-weather conditions for which a CSO is expected to occur” (5 sampling events).

- 3- **Monitoring Parameters:** Receiving water monitoring should include identified parameters of concern, primarily indicator bacteria, e.g., *Enterococcus* for SE1 designated waterbodies, *E. coli* for freshwater, and Fecal Coliform for SE2 and SE3 designated waterbodies. Note,

depending on the location of the CSO discharge in relation to the designated waterbodies, more than one indicator may be necessary to address pathogens assessment in the downstream waterbodies. The permittee should be prepared to address any future changes in the Water Quality Standards (WQS). For example, on November, 26, 2012, EPA recommended new recreational water quality criteria for pathogens; the Department is in the process of evaluating these new criteria.

- 4- **Hydraulic Monitoring and Analysis:** Establishing the hydraulic characteristics of the receiving water is an important first step in a receiving water study, since the physical dynamics of the receiving water are important factors in determining the effects of CSOs on receiving water quality. Information gained through the hydraulic study will help identify sampling locations in the river to determine CSO effects. Hydraulic monitoring in receiving waters consists of assessment of transport characteristics (water depth and velocity) and physical characteristics (elevation, bathymetry and cross-section) of the receiving waterbody.