pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Clean Water

Combined Sewer Overflows (CSO)

Frequently Asked Questions (FAQ)
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Background

The Department of Environmental Protection (DEP) has developed this FAQ document to assist the public in understanding what Combined Sewer Overflows (CSOs) are and the requirements that communities with CSOs must comply with in Pennsylvania. This document does not apply to discharges from Municipal Separate Storm Sewer Systems (MS4s), sewage treatment facilities with separate sanitary sewer systems, or Sanitary Sewer Overflows (SSOs).

This FAQ document was developed to clarify DEP's interpretation of existing regulations and policies governing CSOs. Nothing in this document affects regulatory requirements. The interpretations herein are not an adjudication or a regulation. There is no intent on the part of DEP to give the interpretations in this document that weight or deference. This document provides a framework within which DEP will exercise administrative discretion in the future. DEP reserves the discretion to deviate from the interpretations in this document if circumstances warrant. Questions related to the information in this document should be directed to DEP's Bureau of Clean Water at RA-EPNPDES_Permits@pa.gov. Questions on specific CSO NPDES permits should be directed to the Clean Water Program at the appropriate DEP regional office (visit www.dep.pa.gov and select "Regional Resources").

GENERAL INFORMATION

FAQ #1: What are Combined Sewer Systems (CSSs) and CSOs?

Sewer systems that convey both sanitary sewage (consisting of domestic, commercial, and industrial wastewater) and stormwater (surface and subsurface drainage from rainfall or snowmelt) through a single pipe with combined flow are referred to as CSSs. In dry weather and during light to moderate rainfall, the CSS can typically convey all flows to a sewage treatment facility. During periods of heavy rainfall, however, flows may exceed the capacity of the CSS infrastructure or the sewage treatment facility, resulting in the discharge of untreated combined sewage and stormwater to surface waters at specific locations within the CSS (i.e., CSO outfalls). The flows may also back up into basements and overflow from manholes onto streets. These overflows due to rainfall exceeding the system capacity are referred to as CSOs. Traditionally, CSO outfalls were designed to discharge directly into receiving waters during wet weather events.

A sewage treatment facility's service area can include both combined and separate sewer systems. It is important to note:

- CSOs are not SSOs. SSOs are not covered by CSO-specific regulations, by CSO policies, or by CSO-specific permit conditions. SSOs are strictly prohibited (see 25 Pa. Code § 92a.47(c)).
- An SSO is defined at 25 Pa. Code § 92a.2 as an overflow of wastewater, or other untreated discharge from a separate sanitary sewer system (which is not a combined sewer system), which results from a flow in excess of the carrying capacity of the system or from some other cause prior to reaching the headworks of the sewage treatment facility.
- New CSSs cannot be built in Pennsylvania.

FAQ #2: Why are CSOs a concern?

CSOs contain untreated or partially treated wastewater, and have the potential to carry pathogens, solids, debris, and toxic pollutants to receiving waters, which may impact public health and the environment. CSOs have caused or contributed to beach closures, shellfish bed closures, contamination of drinking water supplies, and other environmental and public health problems.

FAQ #3: Are CSOs illegal?

No. If a CSO community complies with its NPDES permit, CSO discharges during wet weather are authorized under the permit. Note that CSO discharges during dry weather conditions are prohibited.

FAQ #4: What has the Environmental Protection Agency (EPA) done to control CSOs?

To control or minimize CSO discharges, the EPA published the National Combined Sewer Overflow Control Strategy (National CSO Control Strategy) on August 10, 1989. Three objectives were set forth in this document:

1. Ensure that if CSOs occur, they are only as a result of wet weather;
2. Bring all wet weather CSO discharge points into compliance with the technology-based and water quality-based requirements of the Clean Water Act (CWA); and
3. Minimize the impacts of CSOs on water quality, aquatic biota, and human health.

EPA subsequently issued the Combined Sewer Overflow (CSO) Control Policy (CSO Control Policy) in 1994 to:

- Elaborate on the 1989 National CSO Control Strategy and provide a consistent approach for controlling CSOs through the NPDES program;
- Provide guidance to permittees with CSOs, NPDES permitting and enforcement authorities, and state water quality standards (WQS) authorities;
- Ensure coordination among the appropriate parties in planning, selecting, designing, and implementing CSO management practices and controls to meet the requirements of the CWA; and
- Ensure public involvement during the decision-making process.

The CSO Control Policy included four key principles to ensure that CSO controls are cost-effective and meet the following requirements of the CWA:

- Provide clear levels of control that would be presumed to meet appropriate health and environmental objectives;
- Provide sufficient flexibility to municipalities to determine the most cost-effective means of reducing pollutants and meeting CWA objectives and requirements;
- Allow a phased approach for implementation of CSO controls, which considers a community's financial capability; and
- Review and revise, as appropriate, WQS and their implementation procedures when developing long-term CSO control plans to reflect the site-specific wet weather impacts of CSOs.

After the issuance of The CSO Control Policy in 1994, EPA published several guidance documents and worked with stakeholders to facilitate implementation of the Policy. CSO communities needed clear guidance on how they should implement CSO and other wet weather water pollution control programs to attain water quality standards. To help permittees, NPDES permitting authorities, and WQS authorities implement the provisions of the CSO Control Policy, EPA developed the following guidance documents:

- Guidance for Long-Term Control Plan (EPA 832-B-95-002) – The main goal of this document is to provide technical support to assist municipalities in the development of technically feasible, affordable, and comprehensive Long-Term Control Plans (LTCPs) consistent with the objectives of the CSO Control Policy. The objective is to lay a strong foundation for integrating CSO long-term control planning with water quality standards reviews.

- The Long-Term Control Plan-EZ (LTCP-EZ) Template: A Planning Tool for CSO Control in Small Communities (PDF) – This template is a planning tool for use by small communities that have not developed LTCPs and have limited resources to invest in CSO planning.

- Green Long-Term Control Plan-EZ Template (PDF) – This template is a planning tool for use by small communities that have not developed LTCPs and have limited resources to invest in CSO planning. It is intended to help small communities develop an LTCP that will build on Nine Minimum Control (NMC) implementation and lead to additional elimination and reduction of CSOs where needed.

- Guidance for Nine Minimum Control Measures (EPA 832-B-95-003) - This document provides clarity to CSO communities, particularly municipal public works officials or planning and engineering consultants, to evaluate, understand, implement, and document the NMCs.

- Coordinating CSO Long-Term Planning with Water Quality Standards Review (EPA 833-R-01-002) – This guidance discusses integration of CSO LTCP development with water quality standards reviews. It addresses challenges faced by CSO communities in meeting the water quality-based provisions of the CSO control policy and offers planning actions for states and CSO communities.

- Guidance for Screening and Ranking Combined Sewer System Discharges (EPA 832-B-95-004) - This guidance presents a process for screening and ranking CSSs with CSOs that have adverse impacts on water quality, aquatic life, or human health. The purpose of this guidance is to give permitting authorities a method of prioritizing the issuance of NPDES permits to communities with

CSSs and a tool to CSSs communities with multiple CSOs to multiple receiving water bodies for ranking CSOs.

- Guidance for Monitoring and Modeling (EPA 832-B-95-005) - This manual explains the role of monitoring and modeling in the development and implementation of a CSO control program. It also presents a set of guidelines that provide flexibility for a municipality to develop a site-specific strategy for characterizing its combined sewer system operations and impacts and for developing and implementing a long-term CSO control plan.

- Smart Data Infrastructure for Wet Weather Control and Decision Support (EPA 830-B-17-004) – This document provides guidance current advances in technology that municipalities, public utilities, and consultants can use to improve monitoring and decision making during wet weather events.

- Guidance for Financial Capability Assessment and Schedule Development (EPA 832-B-97-004) – This guidance provides a planning tool for the evaluation of financial resources that a permittee has available to implement CSO controls and cooperatively developing CSO control implementation schedules.

- Guidance for Funding Options (EPA 832-B-95-007) - This guidance document assists permittees during the development of their long-term CSO control plans. In their development of construction and financing schedules for implementation of the long-term control plans, permittees can use this guidance document during their assessment of the viability and availability of various funding sources.

- Guidance for Permit Writers (EPA 832-B-95-008) - This manual provides guidance to NPDES permitting authorities and permit writers to develop and issue NPDES permits to control CSOs in accordance with the CSO Control Policy. It recommends procedures and provides example permit language that permit writers can use to develop defensible and enforceable NPDES permit requirements.

- Guidance for Post Construction Compliance Monitoring (EPA 833-K-11-001) – This document provides guidance for municipalities, public utilities, and consultants on developing a Post Construction Compliance Monitoring (PCCM) Program to be implemented after the NMCs and other elements of the LTCP are in place. The objective of the PCCM Program is to assess the effectiveness of CSO controls at meeting local WQS.

In 2000, the CWA was amended. This Amendment is referred to as the Wet Weather Quality Act of 2000 - Section 402 of the Federal Water Pollution Control Act (33 U.S.C. 1342). The amendment added the below provisions for CSOs:

"(q) COMBINED SEWER OVERFLOWS:

(1). REQUIREMENT FOR PERMITS, ORDERS, AND DECREES - Each permit, order, or decree issued pursuant to this chapter after December 21, 2000 for a discharge from a municipal combined storm and sanitary sewer shall conform to the Combined Sewer Overflow Control Policy signed by the Administrator on April 11, 1994 (in this subsection referred to as the "CSO control policy").

(2). WATER QUALITY AND DESIGNATED USE REVIEW GUIDANCE - Not later than July 31, 2001, and after providing notice and opportunity for public comment, the Administrator shall issue guidance to facilitate the conduct of water quality and designated use reviews for municipal combined sewer overflow receiving waters.

(3). REPORT - Not later than September 1, 2001, the Administrator shall transmit to Congress a report on the progress made by the Environmental Protection Agency, States, and municipalities in implementing and enforcing the CSO control policy."

FAQ #5: What has DEP done to control CSOs?

DEP published its CSO Policy in March 2002 with a goal of improving and preserving the quality of waters of the Commonwealth through the adequate permitting and control of CSOs to protect public health and the environment, in compliance with the Wet Weather Water Quality Act of 2000. The permit conditions established pursuant to this policy required permittees to document the NMCs and begin implementing an LTCP to address CSOs in the system within the five-year permit term.

The policy was later replaced by the Pennsylvania Combined Sewer Overflow (CSO) Policy (385-2000-011), published on September 6, 2008, to further enhance and support compliance with CSO and NPDES permit conditions within the regulated community. Under the revised Policy, DEP conducts or provides for appropriate follow-up actions, including compliance monitoring, compliance actions, permit renewal, plan reviews, field inspections, water quality monitoring, and enforcement. These actions are employed as necessary to promote the development and implementation of NMCs and LTCPs at each CSO facility. This new round of permitting and compliance activity is referred to as DEP's Phase III CSO NPDES Permitting / Compliance Program (CSO Phase III Program).

Historically, Pennsylvania had over 150 permitted CSS communities with over 1,900 CSS outfalls throughout the Commonwealth. To date, 30 facilities have either ceased operation, closed their CSS outfalls, or separated their storm and sanitary sewer systems to be removed from the existing CSO facilities list. Many others have reduced their number of outfalls by rerouting a portion of their collection system or by enhancing the capacity of their collection system. Currently, Pennsylvania has over 120 active CSO communities with 1,584 outfalls.

FAQ #6: What are the roles and responsibilities of permittees and regulatory agencies to control CSOs?

EPA's CSO Control Policy defines expectations for permittees and NPDES permitting and enforcement authorities, as shown in Table 1 below. EPA has delegated NPDES program implementation within Pennsylvania to DEP. DEP also has the authority to regulate water pollution in the Commonwealth under the Clean Streams Law (35 P.S.§§ 691.1 et seq.). The Clean Streams Law was enacted to preserve and improve the quality of waters of the Commonwealth for the protection of public health, animal and aquatic life, industrial consumption, and recreation. There are additional responsibilities involving WQS that are not identified in Table 1.

Table 1: General Roles and Responsibilities for Controlling CSOs

Permittee	NPDES Permitting Authority (DEP)	NPDES Enforcement Authority (DEP)
• Evaluate and implement NMCs. • Submit documentation of NMC implementation by January l, 1997. • Develop LTCP and submit for review to NPDES permitting authority. • Comply with permit conditions based on narrative WQS. • Implement selected CSO controls from LTCP. • Perform post-construction compliance monitoring. • Reassess overflows to sensitive areas. • Coordinate all activities with NPDES permitting authority.	• Reassess/revise CSO permitting strategy. • Incorporate into Phase I permits CSO-related conditions (e.g., NMC implementation and documentation and LTCP development). • Review documentation of NMC implementation. • Coordinate review of LTCP components throughout the LTCP development process and accept/approve permittee's LTCP. • Incorporate into Phase Il permits CSO-related conditions (e.g., continued NMC implementation and LTCP implementation). • Incorporate implementation schedule into an appropriate enforceable mechanism. • Review implementation activity reports (e.g., compliance schedule progress reports).	• Ensure that CSO requirements and schedules for compliance are incorporated into appropriate enforceable mechanisms. • Monitor compliance with January l, 1997 deadline for NMCs implementation and documentation. • Take appropriate enforcement action against dry weather overflows. • Monitor compliance with Phase I, Phase Il, and post-Phase Il permits and take enforcement action as appropriate.

FAQ #7: How has the implementation of CSO controls been completed in phases?

According to the CSO Control Policy, a phased approach was adopted for the implementation of CSO controls in order to alleviate the financial burden placed on regulated communities. There have been three phases to date, and NPDES permits have reflected different levels of implementation throughout these phases, as summarized in Table 2 below.

Table 2: Phased permitting approach (from EPA guidance) as modified by DEP's Phase III CSO Program

Permit Requirement	Phase I	Phase II	Phase III
Technology-Based	NMCs, at a minimum	NMCs, at a minimum	NMCs, at a minimum + Narrative TBELs (no visible change during CSO discharge)
Water Quality-Based	Narrative	Narrative + Performance-based standards	Narrative + Performance-based standards + Numeric water quality-based effluent limits (as appropriate), including LTCP Goals
Monitoring	Characterization, monitoring and modeling of CSS	Monitoring to evaluate water quality impacts; monitoring to detect effectiveness of CSO controls	Post-construction compliance monitoring (both before and after coming into compliance with applicable WQS)
Reporting	Documentation of NMC implementation; interim LTCP deliverables	Implementation of CSO controls	Report results of post construction of compliance monitoring including state of compliance with NMCs, applicable LTCP Goal, and applicable WQS.
Special Conditions	Prohibition of dry weather overflows; development of LTCP	Prohibition of dry weather overflows; implementation of LTCP; reopener clause of WQS violations; Sensitive area reassessment	Prohibition of dry weather overflows; reopener clause for WQS violations

The three phases of permit implementation listed above allowed CSO communities and permitting authorities to begin permit coverage while still developing and constructing CSO controls. The majority of CSO communities in Pennsylvania are under Phase II permits, and DEP is working to implement Phase III requirements as permits are reissued.

FAQ #8: What are the technology-based Nine Minimum Controls (NMCs)?

All CSO dischargers must implement the NMCs, which are as follows:

1. Proper operation and regular maintenance programs for the sewer system and CSO outfalls;
2. Maximization of storage in the collection system;
3. Review and modification of pretreatment requirements to ensure that CSO impacts are minimized;
4. Maximization of flow to the publicly owned treatment works (POTW) for treatment;

5. Elimination of CSOs during dry weather;
6. Control of solid and floatable materials in CSOs;
7. Pollution prevention programs to reduce contaminants in CSOs;
8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and
9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

NMCs 1 and 9 are tools for characterizing the CSS's response to wet weather. Monitoring used for the characterization of the CSS may be used to develop a LTCP, and later for the purpose of PCCM. Table 3 below summarizes a few examples of control measures that could be associated with each of the NMCs. The NMCs are not one-time controls, but must be periodically reviewed and updated in the LTCP in the event of facility changes, identified non-compliance, and/or operational experience indicating the need for additional controls.

Table 3: Control measures for Nine Minimum Controls

Nine Minimum Controls	Examples of Control Measures	
1. Proper Operation and Maintenance	• Maintain/repair regulators • Maintain/repair tide gates • Remove sediment/debris • Repair pump stations • Develop/implement inspection program • Inspect collection system	
2. Maximize Use of Collection System for Storage	• Maintain/repair tide gates • Adjust regulators • Remove small system bottlenecks • Prevent surface runoff • Remove flow obstructions • Upgrade/adjust pumping operations	
3. Review and Modify Pretreatment Requirements	Volume Control: • Diversion storage • Flow restrictions • Reduced runoff • Curbs/dikes	Pollutant Control: • Process modifications • Storm water treatment • Improved housekeeping (such as Pretreatment Program tracking and inspections) • BMP Plan
4. Maximize Flow to the POTW for Treatment	• Analyze flows • Analyze unit processes • Analyze head loss • Evaluate design capacity • Modify internal piping • Use abandoned facilities • Analyze sewer system	

Nine Minimum Controls	Examples of Control Measures
5. Eliminate Dry Weather Overflows	• Perform routine inspections • Remove illicit connections • Adjust/repair regulators • Repair tide gates • Clean/repair CSS • Eliminate bottlenecks
6. Control of Solid and Floatable Materials in CSOs	• Screening - baffles, trash racks, screens (static and mechanical), netting, catch basin modifications • Skimming - booms, skimmer boats, flow balancing • Source controls - street cleaning, anti-litter, public education, solid waste collection, recycling
7. Pollution Prevention	• Source controls (see above) • Water conservation
8. Public Notification	• Posting (at outfalls, use areas, public places) • TV/newspaper notification • Direct mail notification
9. Monitoring	• Identify all CSO outfalls • Record total number of CSO events and frequency and duration of CSOs for a representative number of events • Summarize locations and designated uses of receiving waters • Summarize water quality data for receiving waters • Summarize CSO impacts/incidents

CSO LONG-TERM CONTROL PLANNING

FAQ #9: What is the purpose of a Long-Term Control Plan (LTCP) and what does it address?

LTCPs are developed and implemented with an objective of the permittee achieving WQS, either through elimination or control of CSO discharges. The overall planning approach consists of three major steps: system characterization, development and evaluation of alternatives, and selection and implementation of control measures. Each of these steps is discussed separately in detail in the Guidance for Long-Term Control Plan (EPA 832-B-95-002).

The CSO Control Policy lists nine elements that should be addressed in the overall planning approach, as follows:

1. **Characterization, monitoring, and modeling** activities as the basis for selection and design of effective CSO controls;
2. **A public participation** process that actively involves the affected public in the decision-making to select long-term CSO controls;
3. Consideration of **sensitive areas** as the highest priority for controlling overflows;
4. **Evaluation of alternatives** that will enable the permittee, in consultation with the NPDES permitting authority, WQS authority, and the public, to select CSO controls that will meet CWA requirements;

5. **Cost/performance considerations** to demonstrate the cost benefit relationships among a comprehensive set of reasonable control alternatives;
6. **Operational plan** revisions to include agreed-upon long-term CSO controls;
7. **Maximization of treatment at the existing POTW treatment plant** for wet weather flows;
8. **An implementation schedule** for CSO controls; and
9. **A post-construction compliance monitoring program** adequate to verify compliance with water quality-based CWA requirements and ascertain the effectiveness of CSO controls.

FAQ #10: What are sensitive areas? Who decides which areas are sensitive?

Sensitive areas are water bodies that are sensitive to pollution and therefore warrant special consideration during the CSO planning process. Section II.C.3 of the CSO Control Policy states that the highest priority should be given to controlling CSO discharges to sensitive areas. The CSO Control Policy establishes six (6) criteria for defining a sensitive area:

1) Designated Outstanding National Resource Waters;
2) National Marine Sanctuaries;
3) Waters with threatened or endangered species and their habitat;
4) Waters with primary contact recreation;
5) Public drinking water intakes or their designated protected areas; and
6) Shellfish beds.

The initial identification of sensitive areas should be made by the NPDES permitting authority and the permittee in consultation with appropriate state and federal agencies. The final determination of sensitive areas will be made by the permit writer. Refer to DEPs eMapPA and 25 Pa. Code Chapter 93 for stream classifications and designated uses in Pennsylvania.

FAQ #11: What are "priority areas"?

During LTCP development, the permittee may choose to designate certain priority areas for implementation of CSO controls. The term "priority areas" is not defined by EPA. In general, this refers to areas of some environmental significance that do not meet the criteria to be considered sensitive areas as defined in EPA's CSO Control Policy. These priority areas may include, but are not limited to, public access areas (i.e., near marinas, schools, playgrounds, parks, or athletic fields) or use of shallow streams for recreational activity other than full contact (i.e., wading).

FAQ #12: What actions should be taken to avoid or minimize CSO impacts in sensitive areas?

The CSO Control Policy states that if sensitive areas are present and impacted, the LTCP should include provisions to:

- Prohibit new or significantly increased overflows;
- Eliminate or relocate overflows wherever physically possible and economically achievable;
- Treat overflows where necessary; and

- Where elimination or treatment is not achievable, reassess impacts each permit cycle.

Sensitive areas should be properly identified prior to the evaluation of CSO control alternatives. This allows a CSO community to identify and estimate costs for controls that could eliminate or relocate CSOs from sensitive areas where pollutants pose a high environmental or public health risk and where control efforts should be focused. The cost of these controls can then be considered, along with the community's financial capability, to evaluate cost-effective controls for the receiving waters.

FAQ #13: What alternatives should be considered during development of the LTCP?

Under LTCP element #4 in FAQ #9 above, the CSO Control Policy provided two alternative approaches for CSO communities to consider when evaluating water quality-based CSO control options and ultimately selecting controls to meet water quality standards under the CWA. When complete separation of the sewer system cannot be achieved, these alternatives are:

1) The "presumption approach," under which achievement of certain performance criteria (i.e., no more than 4-6 untreated overflow events per year; the elimination or capture for treatment of at least 85 percent by volume of CSS flows during precipitation events on a system-wide annual average basis; or elimination or removal of at least the mass of pollutants identified in LTCP element #1 as causing water quality impairments) would be presumed to provide an adequate level of control to attain water quality standards; and

2) The "demonstration approach," wherein the permittee may develop and implement an LTCP that they can demonstrate meets applicable water quality standards, even if the criteria listed under the presumption approach are not fully met.

FAQ #14: What treatment is required for CSOs?

CSO dischargers must provide minimum treatment of combined sewer flows in certain situations. Minimum treatment includes: 1) primary clarification (or equivalent); 2) solids and floatables removal and disposal; and 3) disinfection, where necessary, including removal of harmful disinfection residuals. Minimum treatment must be provided when:

- The presumption approach to LTCP planning is used and the no more than 4-6 untreated overflows per year alternative is selected. There may be more than 4-6 overflows as long as minimum treatment is provided to overflows exceeding 4-6 per year.

- The presumption approach to LTCP planning is used and the at least 85 percent elimination or capture for treatment alternative is selected. If CSS flows are not eliminated, at least 85 percent must be captured and provided minimum treatment on a system-wide annual average basis.

- Wet weather flows passing the headworks of a POTW that bypass secondary treatment must be provided minimum treatment and any other treatment that can reasonably be provided.

FAQ #15: How should CSO communities approach long-term control planning?

See Figure 1 in EPA's Guidance: Coordinating CSO Long-Term Planning with Water Quality Standards Review (July 31, 2001, 833-R-01-002) document and Exhibit 1-2 in EPA's Guidance for Long-Term Control Plan (EPA 832-B-95-002) for visual examples of EPA's recommendations on approaching the development of LTCPs.

FAQ #16: When is it appropriate for a permittee to use the presumption approach?

The presumption approach is applicable if the data collected during characterization, monitoring, and modeling of the CSS suggests that the use of this standardized approach will result in the achievement of WQS. After system-wide flow and pollutant data are collected, CSO communities should evaluate whether WQS can be attained by meeting the performance criteria listed under the presumption approach in FAQ #13 above. If this evaluation suggests that the achievement of the performance criteria will not result in the attainment of WQS, the permittee is expected to return to the planning process to "demonstrate" how WQS will be achieved through additional controls.

The CSO community's LTCP is an enforceable narrative Water Quality-Based Effluent Limit. If LTCP objectives are not met as per a compliance schedule contained in an NPDES Permit, the LTCP may need to be revised to come into compliance. The burden falls on the permittee to justify a presumptive approach if the receiving stream is impaired for bacteria or pathogens and/or if the CSO discharges would contribute to an existing impairment.

FAQ #17: According to the CSO Control Policy, one option for the LTCP is the "elimination or the capture for treatment of no less than the mass of the pollutants identified as causing a water quality impairment." How can a permittee identify the pollutants causing a water quality impairment?

Pollutants identified as causing water quality impairment are those pollutants that will cause or contribute to an exceedance of WQS, including designated uses and narrative and numeric water quality criteria. The CSO Control Policy includes a minimum control that requires the permittee to characterize the CSO impacts and the efficacy of CSO controls. During the initial monitoring and characterization of the system, permittees identify pollutants present in their CSO discharges and determine how their presence affects instream pollutant concentrations. The instream concentrations should then be compared to all applicable WQS, including any wasteload allocation (WLA) in Total Maximum Daily Loads (TMDLs), to determine if the discharge pollutants are causing or contributing to an impairment. DEP's eMapPA system can be consulted to determine if a receiving stream is known to be impaired and/or if there is an existing TMDL to address known causes of impairments.

FAQ #18: How many Pennsylvania communities have used the presumption approach for their CSO LTCP?

Approximately 90% of CSS facilities in Pennsylvania have chosen the presumption approach (either 4-6 untreated overflows per year or 85% capture by volume of the combined sewage collected in the CSS

during precipitation events on an annual average basis) for their LTCP. The remaining facilities have chosen to either fully separate their sanitary and storm sewer systems or to use a combination of partial separation with the presumption/demonstration approaches for the remaining CSSs in their LTCP. As described in FAQ #5 above, many CSSs have been separated or rerouted to eliminate CSO outfalls throughout the Commonwealth. For example, one medium-sized city in Pennsylvania has eliminated 49 CSO outfalls since the beginning of program implementation. Several years of collected flow data demonstrates that the controls in place can now collect over 90% of the CSS's wet weather flow. Many LTCPs in the Commonwealth have been completed or are close to completion and are now required to develop a PCCM Program to evaluate the efficacy of implemented controls in attaining the applicable WQS.

FAQ #19: What are CSO Controls? Are there specific controls that must be used?

The term "CSO controls" refers to any measure taken to mitigate the effects of CSOs and may include actions such as regulatory/ordinance updates, operational/maintenance practices, or physical system improvements. The only required controls specified by the CSO Control Policy are the NMCs; however, the implementation of these alone will typically not result in meeting the CSO long-term planning goals. Other than the NMCs, CSO communities are encouraged to consider all possible CSO control solutions with reference to their system monitoring and characterization to determine the most cost-effective options for their system. CSO controls can be most efficiently used when their function and effects are studied across the entire system, as opposed to designing controls to address localized problems within the system.

One example of an alternative CSO control measure is the use of green infrastructure to reduce the volume of stormwater runoff collected by the CSS. Green infrastructure includes the use of bioretention areas, infiltration practices, and general runoff reduction in the upper areas of the collection system. These practices may greatly reduce the need to expand conveyance and treatment facilities at the lower end of the system. For further discussion on the potential of green infrastructure in CSO planning, refer to EPA's Greening CSO Plans (EPA 832-R-14-001) guidance document.

POST-CONSTRUCTION COMPLIANCE MONITORING (PCCM)

FAQ #20: What is a PCCM Program?

EPA's CSO Control Policy requires post-construction monitoring to verify the efficacy of CSO control strategies implemented under the presumption approach to comply with WQS. In May 2012, EPA published the CSO Post Construction Compliance Monitoring Guidance (833-K-11-001) to assist permittees in developing PCCM Programs. Post-construction monitoring applies to any CSO outfall that is controlled to meet WQS.

Monitoring requirements for a PCCM Program are established in NPDES permits and may be specific to a permittee's LTCP. These monitoring requirements generally include monitoring of a representative number of CSOs for a representative number of wet weather events for certain key parameters along with ambient water quality monitoring to determine attainment of WQS.

FAQ #21: Why is PCCM required?

PCCM is necessary to **v**erify attainment of WQS or that CSOs are not precluding attainment of WQS; determine effectiveness of CSO controls with respect to reduction in volume/load or reduction in CSO frequency; compare current conditions with conditions before the controls were put in place (baseline); build on data and analysis supporting the development of the LTCP; and determine adherence to permit conditions.

FAQ #22: What are the expectations for PCCM?

PCCM informs the permitting authority and permittee on whether the assumptions in the LTCP were correct and whether the LTCP goals were met. The PCCM Program may include rainfall monitoring, monitoring and/or modeling of the CSS to show reduced CSO volumes and discharge frequencies over time, monitoring during wet weather, instream biological assessments, monitoring upstream and downstream of CSO outfalls, and other activities. Monitoring should be focused on performance measures to track the impact of chosen control measures such as reduced volume/frequency of overflows (#/year); reduced floatables (e.g., tons/year collected); improved bacteria concentrations (fecal coliform and E. coli); and restored habitat (length or acres) in the overflow area.

At a minimum, a PCCM Plan is expected to include CSO and instream monitoring for no less than 5 years for pathogens (i.e., fecal coliform and E. coli) and other pollutants that are present in CSO discharges for which there are numeric water quality criteria in a manner consistent with the criteria (e.g., acute, chronic). If achievement of WQS is demonstrated following the initial period, further monitoring may be reduced.

FAQ #23: What are the components of a PCCM Program?

A permittee's PCCM Program is described in a PCCM Plan and should:

- Establish performance measures and metrics based on the goals identified in the LTCP;
- Describe the data/analysis required to assess performance;
- Establish a plan and protocol for data collection/analysis; and
- Identify compliance reporting products and schedules.

The PCCM Plan, which is submitted to DEP for review and approval prior to completion of LTCP activities, may include 1) Quality Assurance Project Plans (QAPPs), 2) Field Sampling Plans, and 3) Standard Operating Procedures (SOPs). Additional details can be found in Section 3 of EPA's CSO Post Construction Compliance Monitoring Guidance (833-K-11-001). Further assistance on performing monitoring to verify the effectiveness of CSO controls and assess compliance with WQS can be found in Section 4 of this guidance as well as in Section 5 of EPA's 1999 Combined Sewer Overflows Guidance for Monitoring and Modeling (832-B-99-002). Permittees may also refer to DEP's Data Collection Protocols Monitoring Book for guidance on sample and data collection.

FAQ #24: Who should conduct the monitoring?

The permittee is responsible for conducting PCCM. To support their PCCM Program the permittee may collect their own data or, if available, use monitoring data from other sources (e.g. federal and/or state agencies). Permittees are responsible for verifying the quality and applicability of any secondary data used from other sources. Where requested, the permittee should coordinate instream water quality sampling with the appropriate DEP regional office for split-sampling.

FAQ #25: What parameters or pollutants should be monitored?

The permittee, in consultation with DEP, should select the pollutants to be included in the PCCM Program. The permittee should document these pollutants and the rationale for their selection in the PCCM Plan. As noted in FAQ #22, monitoring for fecal coliform and E. coli and other pollutants present in CSO discharges that have numeric water quality criteria (e.g., pH, Dissolved Oxygen) is required. Other parameters of concern may include, but are not limited to: Flow (volume and flow rate), Total Suspended Solids (TSS), 5-Day Biochemical Oxygen Demand (BOD_5), Settleable Solids, nutrients (e.g., Total Nitrogen and Total Phosphorus), and toxic pollutants reasonably expected to be present in the CSO based on an industrial survey or tributary land use. Pollutants subject to a TMDL for the receiving waters should also be considered. Table 4 contains example parameters for which DEP may require PCCM.

Table 4: PCCM Pollutant Monitoring Guidance

Waterbody or CSO attribute	Example parameters to be monitored
Waterbody on 303(d) list for dissolved oxygen impairment	Nutrients, BOD_5, Dissolved Oxygen (DO)
Waterbody on 303(d) list for sediment/siltation	Settleable Solids, Turbidity
Waterbody designated uses include primary contact recreation	Bacterial Indicators
Waterbody zinc concentrations exceeding WQS	Dissolved Zinc, Hardness
Fish kills reported in waterbody	DO, BOD_5, Oil and Grease, pH, Toxic Metals, Hardness, Pesticides
CSS within a coastal system	Sodium, Chloride, TDS or Conductivity
Waterbody with existing TMDL for Abandoned Mine Drainage (AMD) impacts	Aluminum, Iron, Manganese, pH
Chesapeake Bay TMDL	When the NPDES Permit has Chesapeake Bay annual mass limits, monitoring of CSO Total Nitrogen and Total Phosphorus mass loads may be required.

FAQ #26: How can communities demonstrate through their PCCM Program that implementation of the LTCP is achieving WQS?

The ultimate expectation of the CWA and CSO Control Policy is to meet applicable WQS and protect the designated uses of the receiving waterbody. If the LTCP has been developed based on the presumption approach, the permittee should define system-wide (baseline) and annual average conditions in the CSO control assessment plan. These values will be used to determine the reductions needed to meet the presumption approach criteria (either fewer than 6 overflows per year or 85% capture by volume of the combined sewage collected in the CSS during precipitation events on an annual average basis). Permittees should discuss the appropriate time frames for evaluating the success of CSO control targets with DEP to ensure that adequate data are collected. The annual average contains both sewage and runoff components. The annual average sewage volume can be determined by modeling or metering records, while the rainfall component should include ranking annual rainfall, assessing month-to-month variations, assessing rainfall intensity, and assessing return frequency.

For both the presumption and the demonstration approach, the most direct method for permittees to verify the attainment of WQS is to monitor the receiving waters. Receiving water monitoring should be specified in the PCCM Program to demonstrate the impact of the implemented CSO controls on water quality. If a water quality model will be used, the permittee should describe the model and the data that will be needed to calibrate and validate the model. Permittees should also include a discussion of monitoring and data collection protocols used to calibrate or verify the model, including references to the field sampling plan, as appropriate.

FAQ #27: What if the chosen approach does not result in the attainment of applicable WQS?

EPA's CSO Control Policy clearly states that the end goal of the CSO program and any associated planning and implementation is the attainment of WQS under the CWA. If it is determined through PCCM that the implemented CSO controls were not successful in attaining WQS, the permittee should examine what reductions were achieved by the CSO controls and re-evaluate and revise the LTCP as necessary in order to attain WQS. Chapter 4.7 of the Guidance for Long-Term Control Plan (EPA 832-B-95-002) discusses re-evaluation of existing controls and making updates to the LTCP if the PCCM demonstrates that WQS have not been attained.

If the permittee believes that the applicable WQS are not attainable, they may seek to revise the WQS based on the findings of their PCCM Program. Permittees should contact DEP's Bureau of Clean Water, Division of Water Quality if this option is pursued.

FAQ #28: How are the LTCP expectations for CSO facilities incorporated into NPDES permits?

CSSs in the Commonwealth typically fit into one of two categories: 1) the CSS is publicly owned and operated and flows to a POTW; or 2) the CSS is publicly owned and operated but its owners/operators are not directly responsible for the operation of the wastewater treatment facilities that receive flow from the collection and conveyance system (also called a satellite CSS). These two types are further divided into "Small" and "Large" systems serving populations less than or greater than 75,000 people. DEP may allow a focused LTCP for CSO facilities serving populations of less than 75,000 residents, consistent

with EPA's CSO Control Policy. At a minimum, DEP requirements for these systems include continued implementation of the NMCs, public participation, consideration of sensitive areas and PCCM. The PAG-06 General Permit may be used for NPDES permit coverage for satellite CSSs serving less than 75,000 people and do not discharge to special protection waters. For all other types of CSSs an individual NPDES permit is required. Part A of individual NPDES permits identifies the authorized CSOs and includes general requirements for CSO discharges. Part C of individual NPDES permits includes specific requirements to implement NMCs, LTCPs, and PCCM and will typically contain a compliance schedule.

FAQ #29: How long does the PCCM Program need to be in place after attaining WQS?

At the discretion of the DEP, post-construction monitoring may be limited to representative outfalls and parameters after achieving consistent compliance with WQS and successfully maintaining the designated use of each surface water receiving CSO discharges. Ongoing monitoring requirements may be assigned in the NPDES permit for CSO discharges for as long as the CSO outfalls remain active.

ADDITIONAL QUESTIONS AND RESOURCES

FAQ #30: How can CSO discharges be eliminated?

There are three general approaches to eliminating CSOs:

1. *Sewer Separation:* Communities can construct a separate system of pipes to collect stormwater during rainfall events. Stormwater should be routed away from the CSS when practicable as part of sewer maintenance or upgrade projects and new development. Maintenance projects to reduce Inflow & Infiltration (I&I) can also reduce CSS flows by minimizing stormwater inflow via manholes and groundwater infiltration. By removing stormwater from the sanitary sewer, the system should no longer overflow during heavy rainfall.

   Building another piping system can be challenging and expensive, especially in densely populated urban areas where system separation requires extensive investigation and redirecting of pipes to remove all cross connections. The construction work for a sewer separation project will likely impact other utilities and traffic for an extended period, since multiple utilities exist in some roadways and some utilities may need to be relocated or modified for the new stormwater piping.

2. *Increase Storage Capacity:* Storage facilities can be constructed – either in-line with the main system conveyance, or in a parallel system to which flow can be diverted – to store excess combined sewer flows during heavy rainfall and release it to the treatment plant at a controlled rate.

   Underground reservoirs and larger conveyance pipes such as interceptors and tunnels can be used to temporarily store combined wastewater and stormwater, but they usually must be large enough to hold several million gallons. Because increased storage systems can operate in conjunction with existing collection systems, they can be constructed without interrupting service; however, available space is the limiting factor with this approach.

3. *Increase Treatment Capacity:* Treatment facility capacity can be increased, or additional facilities can be constructed to treat the combined wastewater and stormwater before it is discharged. Some CSO communities construct additional or expanded facilities that are only used to achieve minimum treatment during CSO events (see FAQ #14 above). As with the other approaches, this depends on the availability of space and funding constraints, as well as ongoing operations and maintenance capabilities.

By properly monitoring and characterizing the system at the beginning of the LTCP process, CSO communities can determine which approach is most appropriate and cost effective. Each system is unique and will most likely utilize a combination of the approaches above to eliminate CSO discharges.

FAQ #31: How much rain does it take for a CSO discharge to occur?

The specific rainfall volume and intensity (volume over time) that will cause a CSO to occur is different for each CSS. Typically, this can be determined during monitoring and characterization of the sewer system to establish baseline conditions. The CSS flow data can be evaluated to develop an understanding of the hydraulic response of the system to rainfall events. Some locations may experience CSO discharges during a relatively moderate storm, while other locations will only overflow during heavier or longer duration storms.

FAQ #32: How long does a waterbody remain impacted after a rain event?

It depends, as the volume and duration of the overflow and the flow in the receiving waterbody will vary. It may take several days for the surface water to return to baseline conditions. To ensure public safety, recreational uses should be suspended for periods when bacteria levels are elevated, which typically extend beyond the end of the rainfall or observable runoff.

FAQ #33: How can I find out if there are CSO outfalls near me?

First, check DEP's CSO list to determine whether you live in or near an active CSO community. Specific locations of CSO outfalls in those communities may be obtained by contacting your local sewer authority or by conducting a file review of CSO information in the appropriate DEP regional office. Locations of CSO outfalls should be identified along surface waters through signage.

FAQ #34: How do I know when a CSO discharge occurs?

All CSO permittees should have as part of their NMCs a public notification plan to inform the public of when a CSO discharge has occurred and potential impacts. The timing and method of public notice may vary depending on the permittee's plan. Residents can ask their local municipality or sewer authority for a copy of the notification plan and specific notification procedures.

FAQ #35: Should I avoid swimming or other recreational activities downstream of CSO outfalls?

As a general precaution, DEP recommends that recreational activities be avoided immediately downstream of CSO outfalls where direct contact with CSO-impacted surface waters could occur. The probability of encountering CSO-impacted surface waters is generally highest during and immediately following precipitation events.

FAQ #36: Are new stormwater discharges allowed to flow into a CSS?

When land cover changes from pervious to impervious surface within the service area of a CSS, new or additional stormwater flows may be generated. These flows should generally not be directed to a CSS as doing so could impede the permittee's ability to implement its NMCs or LTCP.

FAQ #37: Are industrial sites that discharge stormwater into a CSS required to obtain their own permit?

Existing industrial sites that discharge stormwater associated with industrial activities (as defined by federal regulations) to CSSs are not required to apply for and obtain their own NPDES permit coverage.

FAQ #38: Where can I find out more?

For more information visit EPA's website, contact your local DEP regional office (visit www.dep.pa.gov and select Regional Resources) or contact DEP's Bureau of Clean Water, NPDES Permitting Division at RA-EPNPDES_PERMITS@pa.gov.

Version History

Date	Version	Revision Reason
12/14/2020	1.0	Original