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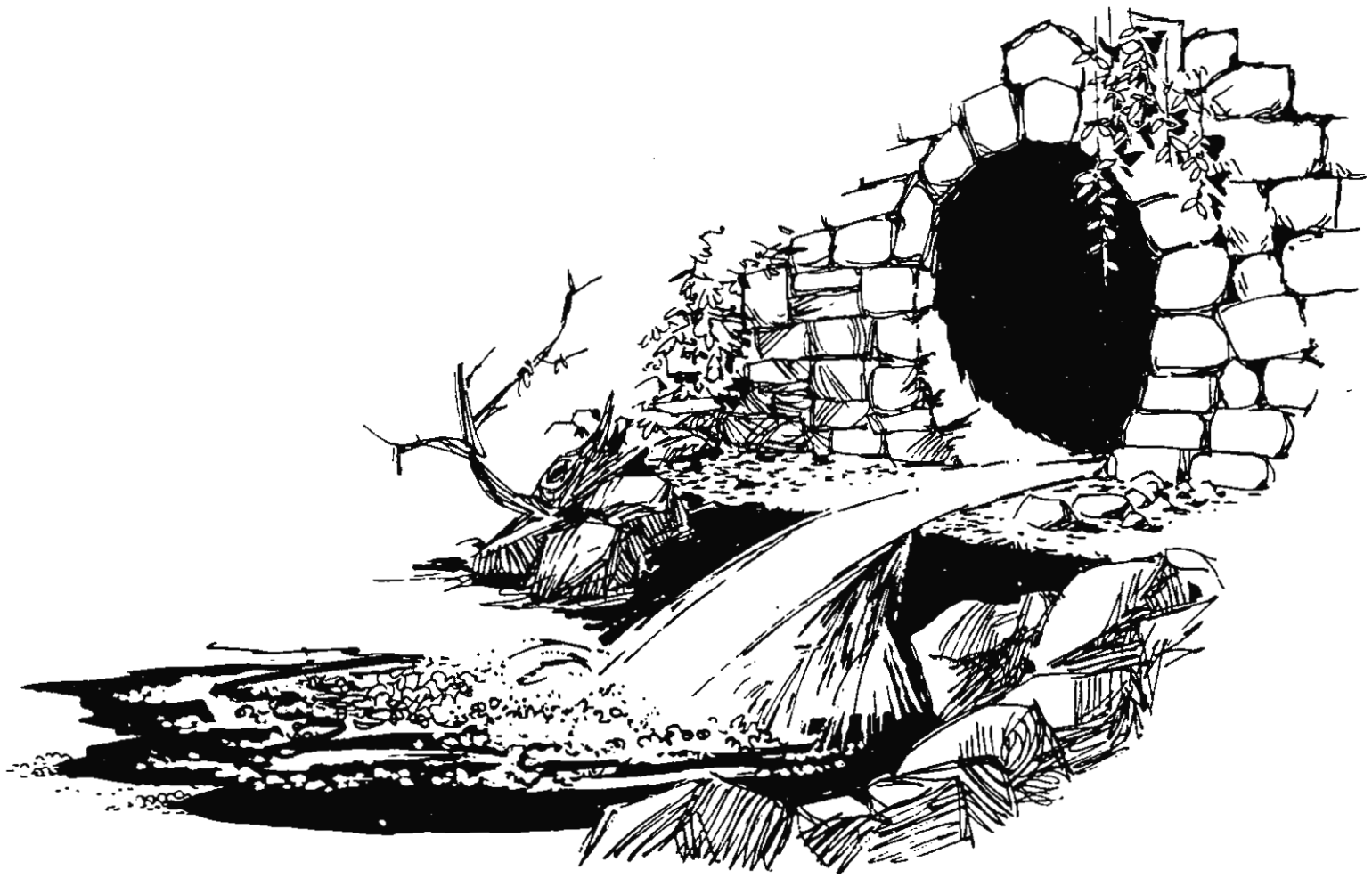
Combined Sewer Overflows

Guidance For Permit Writers



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Office of Wastewater Management
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

August 1995

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 3 1995

OFFICE OF WATER

MEMORANDUM

SUBJECT: CSO Guidance for Permit Writers

FROM: Michael B. Cook, Director (4201)
Office of Wastewater Management

TO: Interested Parties

I am pleased to provide you with the Environmental Protection Agency's (EPA's) guidance document for permit writers involved in developing National Pollutant Discharge Elimination System (NPDES) permits with Combined Sewer Overflow (CSO) conditions. This document is one of several being prepared to foster implementation of EPA's CSO Control Policy. The CSO Control Policy, issued on April 11, 1994, establishes a national approach under the NPDES permit program for controlling discharges into the nation's waters from combined sewer systems.

To facilitate implementation of the CSO Control Policy, EPA is preparing guidance documents that can be used by NPDES permitting authorities, affected municipalities, and their consulting engineers in planning and implementing CSO controls that will ultimately comply with the requirements of the Clean Water Act.

Specifically, this manual provides guidance to NPDES permitting authorities and permit writers to develop and issue NPDES permits to control CSOs in accordance with the expectations of the National CSO Control Policy. It recommends procedures and provides example permit language that permit writers can use to develop defensible and enforceable NPDES permit requirements. This guidance assumes the permit writer is responsible for ensuring coordination and involvement with WQS authorities, enforcement authorities, the public, and the permittee.

This guidance has been reviewed extensively within the Agency as well as by municipal groups, environmental groups, and other CSO stakeholders. I am grateful to all who participated in its preparation and review, and believe that it will further the implementation of the CSO Control Policy.

If you have any questions regarding the manual or its distribution, please call Tony Smith in the Office of Wastewater Management, at (202) 260-1017.

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CHAPTER 1
INTRODUCTION

1.1 BACKGROUND

Combined sewer systems (CSSs) are wastewater collection systems designed to carry sanitary sewage (consisting of domestic, commercial, and industrial wastewater) and storm water (surface drainage from rainfall or snowmelt) in a single pipe to a treatment facility. CSSs serve about 43 million people in approximately 1,100 communities nationwide. Most of these communities are located in the Northeast and Great Lakes regions. During dry weather, CSSs convey domestic, commercial, and industrial wastewater. In periods of rainfall or snowmelt, total wastewater flows can exceed the capacity of the CSS and/or treatment facilities. When this occurs, the CSS is designed to overflow directly to surface water bodies, such as lakes, rivers, estuaries, or coastal waters. These overflows—called combined sewer overflows (CSOs)—can be a major source of water pollution in communities served by CSSs.

Because CSOs contain untreated domestic, commercial, and industrial wastes, as well as surface runoff, many different types of contaminants can be present. Contaminants may include pathogens, oxygen-demanding pollutants, suspended solids, nutrients, toxics, and floatable matter. Because of these contaminants and the volume of the flows, CSOs can cause a variety of adverse impacts on the physical characteristics of surface water, impair the viability of aquatic habitats, and pose a potential threat to drinking water supplies. CSOs have been shown to be a major contributor to use impairment and aesthetic degradation in many receiving waters and have contributed to shellfish harvesting restrictions, beach closures, and even occasional fish kills.

1.2 HISTORY OF THE CSO CONTROL POLICY

Historically, the control of CSOs has proven to be extremely complex. This complexity stems partly from the difficulty in quantifying CSO impacts on receiving water quality and the site-specific variability in the volume, frequency, and characteristics of CSOs. In addition, the financial considerations for communities with CSOs can be significant. The U.S. Environmental

Protection Agency (EPA) estimates the CSO abatement costs for the 1,100 communities served by CSSs to be approximately $41.2 billion.

To address these challenges, EPA's Office of Water issued a National Combined Sewer Overflow Control Strategy on August 10, 1989 (54 *Federal Register* 37370). This Strategy reaffirmed that CSOs are point source discharges subject to National Pollutant Discharge Elimination System (NPDES) permit requirements and to Clean Water Act (CWA) requirements. The CSO Strategy recommended that all CSOs be identified and categorized according to their status of compliance with these requirements. It also set forth three objectives:

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

In addition, the CSO Strategy charged all States with developing state-wide permitting strategies designed to reduce, eliminate, or control CSOs.

Although the CSO Strategy was successful in focusing increased attention on CSOs, it fell short in resolving many fundamental issues. In mid-1991, EPA initiated a process to accelerate implementation of the Strategy. The process included negotiations with representatives of the regulated community, State regulatory agencies, and environmental groups. These negotiations were conducted through the Office of Water Management Advisory Group. The initiative resulted in the development of a CSO Control Policy, which was published in the *Federal Register* on April 19, 1994 (59 *Federal Register* 18688).

The intent of the CSO Control Policy is to:

- 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
- Ensure public involvement during the decision-making process.

The CSO Control Policy contains provisions for developing appropriate, site-specific NPDES permit requirements for all CSSs that overflow due to wet weather events. It also announces an enforcement initiative that requires the immediate elimination of overflows that occur during dry weather and ensures that the remaining CWA requirements are complied with as soon as possible.

1.3 KEY ELEMENTS OF THE CSO CONTROL POLICY

The CSO Control Policy contains four key principles to ensure that CSO controls are cost-effective and meet the 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, especially those that are financially disadvantaged, to consider the site-specific nature of CSOs and 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 considering a community's financial capability
- 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.

In addition, the CSO Control Policy clearly defines expectations for permittees, State WQS authorities, and NPDES permitting and enforcement authorities. These expectations include the following:

- Permittees should immediately implement the nine minimum controls (NMC), which are technology-based actions or measures designed to reduce CSOs and their effects on receiving water quality, as soon as practicable but no later than January 1, 1997.
- Permittees should give priority to environmentally sensitive areas.
- Permittees should develop long-term control plans (LTCPs) for controlling CSOs. A permittee may use one of two approaches: 1) demonstrate that its plan is adequate to meet the water quality-based requirements of the CWA ("demonstration approach"), or 2) implement a minimum level of treatment (e.g., primary clarification of at least 85 percent of the collected combined sewage flows) that is presumed to meet the water quality-based requirements of the CWA, unless data indicate otherwise ("presumption approach").
- WQS authorities should review and revise, as appropriate, State WQS during the CSO long-term planning process.
- NPDES permitting authorities should consider the financial capability of permittees when reviewing CSO control plans.

Exhibit 1-1 illustrates the roles and responsibilities of permittees, NPDES permitting and enforcement authorities, and State WQS authorities.

In addition to these key elements and expectations, the CSO Control Policy also addresses important issues such as ongoing or completed CSO control projects, public participation, small communities, and watershed planning.

Exhibit 1-1. Roles and Responsibilities

Permittee	NPDES Permitting Authority	NPDES Enforcement Authority	State WQS Authorities
• Evaluate and implement NMC • Submit documentation of NMC implementation by January 1, 1997 • Develop LTCP and submit for review to NPDES permitting authority • Support the review of WQS in CSO-impacted receiving water bodies • 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, State WQS authority, and State watershed personnel	• 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 • Coordinate the review and revision of WQS as appropriate • Incorporate into Phase II 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 with the progress reports)	• Ensure that CSO requirements and schedules for compliance are incorporated into appropriate enforceable mechanisms • Monitor adherence to January 1, 1997, deadline for NMC implementation and documentation • Take appropriate enforcement action against dry weather overflows • Monitor compliance with Phase I, Phase II, and post-Phase II permits and take enforcement action as appropriate	• Review WQS in CSO-impacted receiving water bodies • Coordinate review with LTCP development • Revise WQS as appropriate: Development of site-specific criteria Modification of designated use to – Create partial use reflecting specific situations – Define use more explicitly Temporary variance from WQS

1.4 GUIDANCE TO SUPPORT IMPLEMENTATION OF THE CSO CONTROL POLICY

To help permittees and NPDES permitting and WQS authorities implement the provisions of the CSO Control Policy, EPA is developing the following guidance documents:

- *Combined Sewer Overflows—Guidance for Long-Term Control Plan* (EPA, 1995a) (EPA 832-B-95-002)
- *Combined Sewer Overflows—Guidance for Nine Minimum Controls* (EPA, 1995b) (EPA 832-B-95-003)
- *Combined Sewer Overflows—Guidance for Screening and Ranking* (EPA, 1995c) (EPA 832-B-95-004)
- *Combined Sewer Overflows—Guidance for Monitoring and Modeling* (EPA, 1995d) (EPA 832-B-95-005)
- *Combined Sewer Overflows—Guidance for Financial Capability Assessment* (EPA, 1995e) (EPA 832-B-95-006)
- *Combined Sewer Overflows—Guidance for Funding Options* (EPA, 1995f) (EPA 832-B-95-007)
- *Combined Sewer Overflows—Guidance for Permit Writers* (EPA, 1995g) (EPA 832-B-95-008)
- *Combined Sewer Overflows—Questions and Answers on Water Quality Standards and the CSO Program* (EPA, 1995h) (EPA 832-B-95-009).

1.5 PURPOSE OF MANUAL AND TARGET AUDIENCE

This manual provides guidance to NPDES permitting authorities and permit writers on developing and issuing NPDES permits to control CSOs in accordance with the expectations of the CSO Control Policy. Whenever possible, the manual translates the CSO Control Policy into instructions, procedures, and example permit language that permit writers can use to develop defensible and enforceable NPDES permit requirements. The document emphasizes the role of the permit writer as the facilitator and coordinator of the CSO control program in achieving compliance with the CWA, including attainment of WQS. This guidance assumes the permit

writer is responsible for ensuring coordination and involvement with WQS authorities, enforcement authorities, the public, and the permittee.

This manual is designed to be used by EPA and State NPDES permit writers who possess a working knowledge of the CWA and NPDES permit regulations and requirements to control point source discharges. Therefore, it provides guidance only for developing CSO-related permit conditions; it does not provide the more general information available in other NPDES permit guidance manuals, such as the training manual for NPDES permit writers. In addition, this manual does not provide technical guidance on the operation of CSSs and the control of CSOs. Information on these topics is contained in other CSO guidance manuals. EPA recommends that the permit writer obtain all of the CSO guidance manuals listed previously and use them in conjunction with this manual during the development and issuance of permits.

1.6 ORGANIZATION OF MANUAL

Chapter 2 presents an overview of the approach to CSO permitting as envisioned by the CSO Control Policy. The chapter explains the responsibilities of NPDES permitting authorities, setting of permitting priorities, and various strategies available to EPA Regions and States for ensuring that the CSO Control Policy objectives are met. Chapter 3 presents guidance on and example permit language for developing initial (Phase I) permit requirements for implementing minimum technology-based control measures and initiating the development of long-term plans for CSO controls. Chapter 4 provides the procedures, requirements, and example permit language for the second round (Phase II) of CSO permits, which implement the selected long-term CSO control measures. Chapter 5 discusses the development of post-Phase II permit requirements, including completion of the construction and implementation of the long-term CSO controls, as well as post-construction monitoring. The manual concludes with appendices, including a compilation of example CSO permit conditions and suggested checklists for evaluating the NMC and LTCP.

CHAPTER 2
INTRODUCTION TO CSO PERMITTING

The Combined Sewer Overflow (CSO) Control Policy provides a national strategy for the control of CSOs. It presents a uniform, nationally consistent permitting approach that should, for the first time, result in the establishment of both technology-based and water quality-based requirements for all CSOs. Although the permitting approach envisioned for CSOs still fits into the regulatory structure of the National Pollutant Discharge Elimination System (NPDES) program at 40 CFR Part 122 and is similar to the permitting approach that most NPDES permit writers are familiar with and have routinely employed for other point source discharges, it is unlike the conventional NPDES permitting approach in many ways. This chapter is designed to provide the permit writer with a clear understanding of the approach for controlling CSOs that is envisioned by the CSO Control Policy. The remainder of this guidance manual is designed to provide the permit writer with a more detailed understanding of how to integrate CSO controls into the NPDES permitting process.

2.1 OVERVIEW OF CSO PERMITTING APPROACH

The CSO Control Policy envisions that CSO control requirements typically will be implemented through NPDES permits. Generally, NPDES permits include both technology-based and water quality-based effluent limitations. In the absence of national effluent guidelines for CSOs, the CSO Control Policy envisions that technology-based controls (i.e., best available technology economically achievable/best conventional pollutant control technology) will be established on a case-by-case basis using the permit writer's best professional judgment (BPJ) and be expressed in the form of best management practices. The technology-based controls will include, at a minimum, the nine minimum controls (NMC) as determined on a BPJ basis by the NPDES permitting authority. In addition, the CSO Control Policy recommends that, initially, water quality-based effluent limits be expressed in the form of narrative requirements and performance-based standards for the combined sewer system (CSS). Ultimately, the water quality-based effluent limits may also be expressed as numeric effluent limits when data are sufficient to support their development.

The CSO Control Policy expects that CSO controls will be incorporated into NPDES permits in a two-phased process. A Phase I permit will require the permittee to implement the NMC, which are technology-based effluent limits as determined on a BPJ basis, and to document that this requirement has been met. The Phase I permit will also require the permittee to develop a long-term control plan (LTCP). The U.S. Environmental Protection Agency (EPA) expects that implementation of the NMC during Phase I will achieve an interim level of CSO control during the time the permittee is developing an LTCP. EPA expects that Phase I permit requirements will be included in NPDES permits, either as permits become due for reissuance during the usual NPDES permitting cycle or, where appropriate, on an accelerated schedule through the permit modification process.

The Phase II permit typically will be the next permit issued after the Phase I permit. In Phase II, the permittee will be required to implement the CSO controls identified in the LTCP. Typically, water quality-based controls will be expressed as performance standards, and technology-based controls will be the NMC, which may be refined to reflect site-specific conditions. Whereas Phase I typically continues for only one permitting cycle, Phase II might continue for several cycles until all selected CSO controls identified in the LTCP have been constructed and implemented.

Although the two-phased approach may be appropriate if a permittee has not implemented any CSO controls, in many instances, the separation between permit phases may not be distinct and permits may contain both Phase I and Phase II elements. For example, a permittee may have already evaluated and selected CSO controls for a portion of its CSS but not evaluated and implemented the appropriate NMC. Thus, the next permit may include the Phase I requirement to evaluate, implement, and document the implementation of the NMC and may also include a Phase II requirement to implement the selected CSO controls. The CSO Control Policy is designed to accommodate these variations in the development and implementation of CSO control programs.

After the selected CSO controls have been implemented, the NPDES permitting authority should issue the post-Phase II permit. This permit should generally contain requirements to continue NMC implementation, properly operate and maintain the completed CSO controls in accordance with the operational plan, and implement the post-construction monitoring program.

2.2 RESPONSIBILITY OF NPDES PERMITTING AUTHORITIES

The permit writer plays a critical role in the CSO permitting process, one that differs from the NPDES permit writer's traditional role in several important aspects. First, the permit writer plays a coordination role comparable to that of a team leader. In setting permitting priorities and facilitating the development of CSO permit requirements, the permit writer has the opportunity to develop a broad base of support for the CSO planning process and proposed CSO controls. The permit writer should serve as the focal point for coordination with State WQS authorities and should also work with enforcement authorities, as appropriate, to incorporate compliance schedules into enforceable mechanisms. The permit writer will also coordinate with local agencies, environmental groups, and other interested or CSO-affected members of the public.

The second difference is that the CSO permit writer's role is ongoing. Even after the issuance of the Phase I permit, the permit writer should continuously review interim LTCP deliverables and other submissions, participating in the ongoing consensus-building process, and developing and preparing for the issuance of Phase II permits.

The permit writer may also be able to assist communities in coordinating aspects of their CSO control programs with each other. This might be particularly beneficial for adjacent small communities discharging to the same receiving water. These communities might save significant resources by coordinating the characterization of their sewer systems and monitoring of the CSO impacts on the receiving water quality rather than pursuing these activities independently. The permit writer may encourage community coordination by advising adjacent communities of their mutual interests and opportunities for coordination.

2.3 CSO PERMITTING PRIORITIES AND WATERSHED CONSIDERATIONS

In response to the 1989 EPA National Combined Sewer Overflow Control Strategy, 30 States have received approval or conditional approval for CSO permitting strategies. These strategies usually provided a priority-setting plan for CSOs. EPA expects States to evaluate the need to revise their CSO strategies for consistency with the 1994 CSO Control Policy. This represents an opportunity for NPDES permitting authorities to reconsider their CSO permitting priorities in light of current or suspected environmental impacts, watershed permitting initiatives, and other factors. States and EPA Regions should review these strategies and establish appropriate permitting priorities for implementation of the CSO Control Policy.

In establishing CSO permitting priorities, the NPDES permitting authority should consider factors such as the environmental impacts of CSOs (e.g., beach closings, human health hazards, and potential risk to endangered species). The NPDES permitting authority should also consider requiring immediate action for CSOs to areas that meet the CSO Control Policy's definition of "sensitive areas." To assist NPDES permitting authorities in establishing CSO permitting priorities consistent with the CSO Control Policy, EPA developed the *Combined Sewer Overflows—Guidance for Screening and Ranking* (EPA, 1995c). This document provides guidance on establishing permitting priorities for CSSs and provides permittees with a tool for prioritizing individual CSOs within their CSSs to allow for effective allocation of resources.

EPA encourages States to use a watershed approach to set permitting priorities. Under a watershed approach, all surface water, ground water, and habitat stressors within a geographically defined area are understood and addressed in a coordinated fashion, as an alternative to addressing individual pollutant sources in isolation. To support States that want to implement a comprehensive statewide watershed approach, the Office of Water has developed guidance and training designed to assist communities and natural resource agencies that are pursuing a watershed approach. One part of this effort is the release of the NPDES Watershed Strategy. This Strategy encourages NPDES permitting authorities to evaluate water pollution control needs on a watershed basis and to coordinate CSO control program efforts with other point and nonpoint source activities within the watershed.

Applying a watershed approach to the CSO control program is particularly timely and appropriate since an ultimate goal of the CSO Control Policy is development of long-term CSO controls that will provide for the attainment of WQS. Since pollution sources other than CSOs are likely to be contributing to the receiving water and affecting whether WQS are achieved, the NPDES permitting authority needs to consider and understand these other sources.

Total maximum daily loads (TMDLs) provide the basis of equitably allocating cost-effective controls on a watershed basis. By examining the contribution of both point and nonpoint sources, the TMDL process ensures better use of limited resources in achieving WQS. To assist in the development of TMDLs for episodic, wet-weather events, EPA plans to publish technical guidance for estimating TMDLs that address integration of steady state and episodic point and nonpoint sources.

2.4 MECHANISMS FOR REQUIRING CSO CONTROLS

The CSO Control Policy envisions that, in most cases, CSO requirements and controls will be incorporated into a municipality's existing NPDES permit for its discharge from the publicly owned treatment works (POTW), much like the incorporation of pretreatment and sewage sludge requirements. CSO conditions may be incorporated into the NPDES permit in several ways: 1) by including the conditions in the permit during the next five-year permit renewal cycle, 2) by modifying the permit for cause in accordance with the criteria in 40 CFR 122.62(a) or (b) (most likely through a major permit modification), or 3) by revoking and reissuing the permit for cause in accordance with the criteria in 40 CFR 122.62(b). EPA assumes that, in most cases, CSO conditions will be incorporated into NPDES permits through permit expiration and reissuance during the five-year permit cycle. (This document assumes this scenario for illustrative purposes.) Unless the permit writer intends to incorporate CSO conditions into an NPDES permit immediately, the permit writer should inform affected parties of the impending changes and encourage them to take steps to implement the CSO Control Policy recommendations, especially the NMC, voluntarily.

EPA recommends that the permit writer integrate CSO conditions into an existing NPDES permit in one of two ways. The CSO conditions can be grouped together and contained in a separate section of the NPDES permit the same way that sewage sludge or pretreatment requirements are often placed in a separate section. Appendix A illustrates how CSO conditions can be grouped together in a separate section of an NPDES permit. Alternately, individual CSO conditions can be integrated into separate sections of the NPDES permit. For example, CSO conditions can be integrated into the effluent limitations, monitoring requirements, and special conditions sections of the permit, as appropriate. Exhibit 2-1 contains an overview of the categories of CSO permitting conditions, which are discussed throughout the manual.

Other tools are available to the NPDES permitting authority in cases where the NPDES permit is not the appropriate mechanism to initiate or require CSO control. In some cases, it might be necessary for the NPDES permitting authority to include the CSO conditions in an appropriate enforceable mechanism. An enforceable order can be issued, either independently or in conjunction with an NPDES permit, when a permittee cannot comply immediately with the terms of the NPDES permit and compliance dates have passed. For example, an enforceable order that requires compliance with the NMC (and submittal of appropriate documentation) no later than January 1, 1997, might be necessary in cases where immediate compliance cannot be achieved.

In addition, the NPDES permitting authority may request information on a community's CSS under Section 308 of the Clean Water Act (CWA) (or State equivalent). Much of the example NPDES permit language can be incorporated into a Section 308 information request.

2.5 COMPLEX COMBINED SEWER SYSTEMS

In the most common and simple case, a single system-wide permit is issued for all CSO outfalls from a single authority. For example, a municipality or a small sanitary sewer authority with one POTW treatment plant should be issued one NPDES permit that addresses requirements for the POTW, as well as for CSOs, storm water, sewage sludge, and a pretreatment program, as appropriate.

Exhibit 2-1. Categories of CSO Permitting Conditions

TIME	0 . . . . . : . . . . . 5 . . . . . 10 . . . . . > Years after Phase I Permit Issuance		
NPDES Permit Requirement	**Phase I**	**Phase II**	**Post Phase II**
A. Technology-Based	• NMC, at a minimum	• NMC, at a minimum	• NMC, at a minimum
B. Water Quality-Based	• Narrative	• Narrative + performance-based standards	• Narrative + performance-based standards + numeric water quality-based effluent limits (as appropriate)
C. Monitoring	• Characterization, monitoring, and modeling of CSS	• Monitoring to evaluate water quality impacts • Monitoring to determine effectiveness of CSO controls	• Post-construction compliance monitoring
D. Reporting	• Documentation of NMC implementation • Interim LTCP deliverables	• Implementation of CSO controls	• Report results of post-construction compliance monitoring
E. Special Conditions	• Prohibition of dry weather overflows (DWO) • Development of LTCP	• Prohibition of DWO • Implementation of LTCP • Reopener clause for WQS violations • Sensitive area reassessment	• Prohibition of DWO • Reopener clause for WQS violations

If a large municipality or sewerage control authority owns and/or operates two or more POTW treatment plants served by CSSs (also owned by the municipality) and each plant has its own NPDES permit, the NPDES permits generally should require an integrated and comprehensive approach to CSO control. This is similar to integrated requirements for a system-wide pretreatment program, where one municipality owns several POTW treatment plants. Each permit should be renewed, modified, or revoked and reissued to include CSO conditions. For example, if a municipality has three POTW treatment plants with individual permits that will be renewed in different years (e.g., treatment plant A's permit will be renewed in 1995, B's permit will be renewed in 1996, and C's permit will be renewed in 1997), conditions addressing **all** CSOs can be incorporated into each permit upon renewal. To begin the LTCP development process without having to wait for all of the permits to be reissued, treatment plant A's permit should address CSOs within the entire jurisdictional boundaries, including the areas discharging to treatment plant B and treatment plant C, and should require development of an LTCP for the entire system. Correspondingly, the NPDES permits for treatment plant B and treatment plant C should contain the same requirements. As an alternative in this same situation, the permit writer may choose to incorporate **all** conditions addressing CSOs only into the first permit to be reissued (i.e., treatment plant A's permit). Incorporating the CSO conditions into only one permit can preclude any confusion or inconsistencies resulting from including the same conditions in several different permits.

In some cases, different parts of a CSS, as well as the treatment plant, might be owned or operated by different sewerage control authorities. In this situation, the permit writer may issue each authority its own permit, containing CSO conditions applicable to the portion of the CSS owned or operated by that authority. The permits should require synchronization, coordinated preparation, and implementation of CSO controls among all authorities within the CSS. Each authority should be responsible for its collection system and CSOs and should cooperate with the treatment plant permittee receiving the flows from the CSS. If a CSS is permitted separately from the treatment plant, the fact sheets for the different permits should cross reference each other for informational purposes. Alternately, the permit writer can issue

a single permit to all co-permittees, incorporating CSO conditions unique to each CSS and treatment plant. Such co-permittee arrangements are subject to consent by the respective co-permittees.

2.6 PREVIOUS OR ONGOING CSO CONTROL EFFORTS

Some permittees might have already completed portions of the CSO control planning and implementation process. The CSO Control Policy recognizes these ongoing CSO control efforts and does not expect duplication of effort. If the permittee has 1) completed or substantially completed construction of CSO control facilities that are designed to meet the water quality-based requirements of the CWA, 2) substantially developed or is implementing a CSO control program pursuant to an existing permit or enforcement order, and such program is considered by the NPDES permitting agency to be adequate to meet the water quality based requirements of the CWA, or 3) has previously constructed CSO control facilities in an effort to comply with water quality-based requirements of the CWA but has failed to comply due to remaining CSOs, the permit writer should take these efforts into account in determining which of the LTCP elements are still appropriate and consistent with the goals of the CSO Control Policy. However, such a permittee would still be expected to develop an LTCP. Section 3.5.3 presents additional discussion of ongoing efforts.

2.7 COMBINED SEWER SYSTEMS IN SMALLER JURISDICTIONS

The CSO Control Policy recognizes that the development and implementation of a comprehensive LTCP might be difficult or inappropriate for some small municipalities. At the discretion of the permit writer, jurisdictions with total populations under 75,000 may not need to complete all of the formal steps involved in developing an LTCP. Certain provisions of the CSO Control Policy should not be waived, however, such as implementation of the NMC, public participation under the LTCP, and sensitive area considerations. Although the CSO Control Policy is intended to provide some relief for small municipalities, the permit writer should discuss the scope of the LTCP with the permittee and the WQS authority to ensure that the LTCP includes sufficient information to select appropriate CSO controls. Section 3.5.3 discusses considerations for smaller jurisdictions in greater detail.

2.8 MEASURES OF SUCCESS

As municipalities, NPDES permitting authorities, and the public embark on a coordinated effort to address CSOs, serious considerations should be given to "measures of success." For purposes of this discussion, measures of success are objective, measurable, and quantifiable indicators that illustrate trends and results over time. Measures of success generally fall into four categories:

- Administrative measures that track programmatic activities;
- End-of-pipe measures that show trends in the discharge of CSS flows to the receiving water body, such as reduction of pollutant loadings, the frequency of CSOs, and the duration of CSOs;
- Receiving water body measures that show trends of the conditions in the water body to which the CSO occurs, such as trends in dissolved oxygen levels and sediment oxygen demand; and
- Ecological, human health, and use measures that show trends in conditions relating to the use of the water body, its effect on the health of the population that uses the water body, and the health of the organisms that reside in the water body, including beach closures, attainment of designated uses, habitat improvements, and fish consumption advisories.

EPA's experience has shown that measures of success should include a balanced mix of measures from each of the four categories.

As municipalities begin to collect data and information on CSOs and CSO impacts, they have an important opportunity to establish a solid understanding of the "baseline" conditions and to consider what information and data are necessary to evaluate and demonstrate the results of CSO control. Municipalities and NPDES permitting authorities should agree early in the planning stages on the data and information that will be used to measure success and on the extent to which the permit and monitoring plan should include such indicators.

The following list presents examples of potential measures of success for CSO control, organized by the four categories discussed above:

- **Administrative measures:**

  - Number of NPDES permits or other enforceable mechanisms requiring implementation of the NMC
  - Number of NPDES permits or other enforceable mechanisms issued requiring development of LTCPs
  - Number of municipalities meeting technology-based requirements in permits
  - Number of municipalities meeting water quality-based requirements in permits
  - Compliance rates with CSO requirements in permits
  - Dollars spent/committed for CSO control measures
  - Nature and extent of CSO controls constructed/implemented.

- **End-of-pipe measures:**

  - Number of dry weather overflows eliminated
  - Number of CSO outfalls eliminated
  - Reduction in frequency of CSOs
  - Reduction in volume of CSOs
  - Reduction in pollutant loadings (conventional and toxics) in CSOs.

- **Receiving water body measures:**

  - Reduced in-stream concentrations of pollutants
  - Attainment of narrative or numeric water quality criteria.

- **Ecological, human health, and use measures:**

  - Improved access to water resources
  - Reduced flooding and drainage problems
  - Reduced costs and treatment of drinking water
  - Economic benefits (e.g., value of increased tourism, value of shellfish harvested from beds previously closed)
  - Restored habitat
  - Improved biodiversity indices
  - Reduction in beach closures
  - Reduction in fish consumption advisories.

(Note: These measures are included as examples only; EPA is supporting the development of national measures of success for CSOs through a cooperative agreement with the Association of Metropolitan Sewerage Agencies (AMSA). The results of AMSA's efforts are expected to be available in late 1995.)

When establishing CSO measures of success, municipalities and NPDES permitting authorities should consider a number of important factors:

- **Data quality and reproducibility**—Can consistent and comparable data be collected that allow for comparison over time (e.g., trend analysis) and from different sources (e.g., watershed analysis)? Do standard data collection procedures exist?
- **Costs**—What is the cost of collecting and analyzing the information?
- **Comprehensibility to the public**—Will the public understand and agree with the measures?
- **Availability**—Is it reasonably feasible for the data to be collected?
- **Objectivity**—Would different individuals evaluate the data or information similarly, free from bias or subjectivity?
- **Other uses in wet-weather and watershed planning and management**—Can the data be used by State agencies as support for other CSO and watershed planning efforts?

Careful selection, collection, analysis, and presentation of information related to measures of success should allow municipalities, States, and EPA to demonstrate the benefits and long-term successes of CSO control efforts. Notwithstanding the effort to develop national measures of success, municipalities should identify measures, document baseline conditions, and collect appropriate information that demonstrates the cause and effect of CSO impacts and the benefits and success of CSO control. It is likely that measures of success will vary from municipality to municipality and will be determined by the environmental impacts of CSOs on site-specific basis.

2.9 COORDINATION WITH STATE WATER QUALITY STANDARDS AUTHORITY

A primary objective of the LTCP is to develop and evaluate a range of CSO control alternatives that will be sufficient to provide for the attainment of WQS, including designated uses of CSO-impacted receiving waters. To ensure that the LTCP will meet this objective, the WQS authorities, along with the NPDES permitting authorities, EPA, and the permittee, should

be involved throughout the LTCP development process. This will enable everyone to have an opportunity to review the proposed type and extent of data and information to be collected during LTCP development. Such data and information should be used to assess the attainability of the designated uses and might assist States in more precisely defining the use(s) of the CSO-impacted waters. For example, the information could be used to refine the existing WQS to reflect the site-specific wet weather conditions for CSO-impacted receiving waters. The CSO Control Policy recognizes that the review and appropriate revision of WQS is, in many cases, an integral part of LTCP development.

The CSO Control Policy discusses several types of WQS revisions in the WQS program that potentially could be used to address wet weather conditions. These types of revisions include the following:

- Development of site-specific criteria
- Modification of a designated use to include a partial use reflecting situations where a certain event (e.g., a storm) precludes the designated use from occurring
- Modification of a designated use to define the use with greater specificity (e.g., warm water fishery in place of aquatic life use protection)
- Temporary variances from water quality standards.

These mechanisms are described in detail in the *Combined Sewer Overflows—Questions and Answers on Water Quality Standards and the CSO Program* (EPA, 1995h). The decision regarding the mechanism to pursue when considering the WQS revisions will be based on a variety of factors. Thus, the permittee should consult with the NPDES permitting authority and State WQS personnel to determine the most appropriate option.

Data needs, monitoring protocols, and models to be used for system characterization and compliance monitoring should be agreed on early in the process. The water quality impacts of the existing CSOs can then be evaluated to establish a baseline, which can be used to assess the effectiveness of CSO controls once they are implemented. These models and protocols can also

be used to predict whether WQS are likely to be attained after the LTCP has been implemented. The information and data collected should assist States in assessing the need for revising WQS and implementation procedures to better reflect site-specific impacts of CSOs. In addition, coordinating the LTCP development and the review and revision, as appropriate, of WQS and implementation procedures should ensure that the permittee's LTCP and the requirements included in the NPDES permit will be sufficient to comply with the water quality-based requirements of the CWA.

Any review and revision of WQS to reflect wet weather conditions should be conducted with full participation of stakeholders within the affected watershed. This should include the sharing of CSO, storm water, and other point and nonpoint source data among stakeholders. This will enable NPDES permitting authorities and permittees to implement a comprehensive watershed management approach and allow permittees to coordinate the development and implementation of their individual LTCPs with one another.

CHAPTER 3
PHASE I PERMITTING

Consistent with the Combined Sewer Overflow (CSO) Control Policy, the National Pollutant Discharge Elimination System (NPDES) permitting authority and the individual permit writer should approach the CSO permitting process as a two-phased process. This chapter provides guidance on developing and issuing initial or Phase I NPDES permits for CSOs. In particular, it discusses how to develop permit conditions for implementation of the nine minimum controls (NMC) and development of the long-term control plan (LTCP) to meet the technology- and water quality-based requirements of the Clean Water Act (CWA).

3.1 PHASE I PERMIT PROCESS

The Phase I permit should require the permittee to immediately implement the NMC, document implementation of the NMC, and develop the LTCP. The Phase I permit should also require the permittee to gather data to establish the baseline conditions against which CSO controls will be measured.

3.2 INFORMATION NEEDS

In general, the permit writer can draft and issue a Phase I permit with a minimal amount of CSO information, because he or she can require the implementation and documentation of the NMC and development of the LTCP without site-specific data in a generic manner. Much of the data collection should occur during implementation of the NMC and development of the LTCP, and the Phase I permit will contain requirements to obtain those data. Although the CSO information base might not be extensive at the outset of the Phase I permitting process, the information base should grow and evolve during the term of the Phase I permit.

To draft and issue a Phase I permit, the permit writer should have a clear understanding of the jurisdictional boundaries and responsibilities for the combined sewer system (CSS). This information is necessary to determine which NPDES permittees should be subject to CSO requirements. Generally, where the CSS and publicly owned treatment works (POTW) are

operated by a single municipality, the permit will be issued to that municipality. Frequently, however, the relationship is more complicated; several municipalities might own part of the CSS but discharge to a single POTW treatment plant. In this case, CSO permits may be issued to several different municipalities.

In addition, the permit writer should have a thorough understanding of the permittee's past and current progress toward controlling CSOs. First, the permit writer should know which, if any, of the NMC have already been implemented. If any of the NMC have been implemented, the permit writer may determine that site-specific rather than generic permit language is more appropriate for continued implementation of those minimum controls. (See Section 4.4.2 for a discussion of site-specific permit language for the NMC.) The permit writer should also know whether the permittee has substantially developed a CSO control plan, is implementing a CSO control program, or has substantially completed construction of CSO control facilities. If the permittee has completed efforts to control CSOs, the permit writer should consider this progress when drafting the Phase I permit. (Section 3.5.3 provides more information on addressing ongoing CSO control efforts).

The permit writer should also know the approximate population of the community served by the CSS. If the CSS serves a population of less than 75,000, the permit writer may give special consideration to the permittee in developing the LTCP. (Section 3.5.3 provides more information on small system considerations.)

In some instances, pertinent CSO information might be difficult to obtain. In any event, the permit writer should, using readily available information, develop permit conditions requiring the permittee to implement the NMC, document NMC implementation, and develop the LTCP as soon as practical.

Information may be obtained from the NPDES permit application or through informal requests by letter, telephone, or in-person visits. In a limited number of cases, the permit writer may use a more formal mechanism, such as a CWA Section 308 information request or State

equivalent. The Section 308 information request is likely to be an effective approach to obtain information because failure to comply with a Section 308 information request may result in an enforcement action. The permit writer should follow the EPA Regional or State-specific policies regarding such information requests.

3.3 IDENTIFICATION OF CSO OUTFALLS IN THE PERMIT

The permittee might not have identified the locations of all CSO outfalls prior to the issuance of the Phase I permit, although this is a desirable goal. To the extent that the CSO outfalls are known, the permit writer should list them in the permit. If the exact location and number of all outfalls are not known, however, the permit writer should not wait to issue the Phase I permit until this information is available but should include generic permit language to encompass all CSOs. All CSO outfalls should be identified as the municipality characterizes its CSS during LTCP development. Exhibit 3-1 provides example permit language for a CSS for which all CSO outfalls are not known prior to issuance of the Phase I permit. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee.

Exhibit 3-1. Example Permit Language for Identifying CSO Outfalls in the Phase I Permit

The permittee is authorized to discharge from the CSO outfalls listed below and additional CSO outfalls within the boundaries of the permittee's jurisdiction identified after the effective date of the permit. The permittee shall ensure that all CSOs from the CSS comply with the requirements of **[insert appropriate permit section(s) containing CSO requirements]** and other pertinent portions of this permit.

Outfall Number	Overflow Outfall Location	Receiving Water Body
[insert number]	**[insert latitude/longitude (street address optional)]**	**[insert name of receiving water body]**

3.4 NINE MINIMUM CONTROLS

The Phase I permit should require all permittees to immediately implement technology-based requirements (best available technology economically achievable (BAT)/best conventional pollutant control technology (BCT)) which, in most cases, are expected to be the NMC, as determined on a best professional judgment (BPJ) basis by the NPDES permitting authority. The NMC are controls that are designed to reduce the magnitude, frequency, and duration of CSOs

and their effects on receiving water quality. Typically, they do not require significant engineering studies or major construction and can be implemented in a relatively short time period. Section 301(b) of the CWA requires immediate compliance with technology-based controls (i.e., BAT or BCT). Thus, if immediate compliance with the NMC cannot be achieved, an appropriate enforceable mechanism should accompany the permit. The enforceable mechanism should contain a compliance schedule for implementing the NMC as soon as practicable, but no later than January 1, 1997. (See Section 3.4.1 for more detail.) Section 2.4 describes additional mechanisms for implementation of NMC in cases where the permit is not expected to be reissued in the normal five-year cycle prior to January 1, 1997.

The NMC are intended to provide technology-based controls, applied on a site-specific basis, that will immediately reduce CSO impacts on water quality and that can be implemented early in the control process without the type of in-depth studies necessary for the LTCP. Exhibit 3-2 lists examples of NMC measures. Section 3.6 further discusses the use of the NMC to satisfy the BAT/BCT requirement on a BPJ basis. The U.S. Environmental Protection Agency (EPA)'s *Combined Sewer Overflows—Guidance for Nine Minimum Controls* provides a detailed description of each minimum control, example measures for each control, and their associated advantages and limitations (EPA, 1995b). Although the permittee will be responsible for implementing technology-based control measures that satisfy each of the NMC, EPA does not expect that a separate set of control measures will necessarily be required for each control. Rather, EPA encourages a holistic approach to addressing the NMC. For example, the same control measure(s) could satisfy both "Control of Solid and Floatable Materials" and "Pollution Prevention."

Exhibit 3-2. Summary of the Nine Minimum Controls

Minimum Control	Examples of Control Measures	
Proper Operation and Maintenance	• Maintain/repair regulators • Maintain/repair tidegates • Remove sediment/debris • Repair pump stations • Develop inspection program • Inspect collection system	
Maximum Use of Collection System for Storage	• Maintain/repair tidegates • Adjust regulators • Remove small system bottlenecks • Prevent surface runoff • Remove flow obstructions • Upgrade/adjust pumping operations	
Review and Modify Pretreatment Requirements	Volume Control • Diversion storage • Flow restrictions • Reduced runoff • Curbs/dikes	Pollutant Control • Process modifications • Storm water treatment • Improved housekeeping • BMP Plan
Maximum Flow to the POTW for Treatment	• Analyze flows • Analyze unit processes • Analyze headloss • Evaluate design capacity • Modify internal piping • Use abandoned facilities • Analyze sewer system	
Eliminate Dry Weather Overflows	• Perform routine inspections • Remove illicit connections • Adjust/repair regulators • Repair tidegates • Clean/repair CSS • Eliminate bottlenecks	
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	
Pollution Prevention	• Source controls (see above) • Water conservation	
Public Notification	• Posting (at outfalls, use areas, public places) • TV/newspaper notification • Direct mail notification	
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	

Implementation of the NMC should enable the permittee to achieve an intermediate level of CSO control while the LTCP is being developed. Implementation and documentation of the NMC should involve the following steps:

- Evaluate alternative control measures for implementing each of the NMC. The permittee should be required to evaluate alternatives and select appropriate control measures to meet the NMC.

- Implement the most appropriate control measures. The permittee should be required to implement those control measures that are most appropriate for the site. The control measures should be refined in Phase II, as appropriate, to reflect the information obtained during the Phase I permit term. These control measures should eventually become part of the long-term CSO control program.

- Document implementation of the selected control measures. This documentation should detail the baseline conditions prior to NMC implementation, the permittee's evaluation of the efficacy of CSO controls after implementation of the NMC, the baseline conditions upon which the LTCP should be developed, and the degree to which the NMC are sufficient to provide attainment of water quality standards (WQS).

- Report on implementation. The permittee should be required to submit appropriate documentation to illustrate implementation of the NMC (discussed in Section 3.4.2).

3.4.1 Implementation Considerations

Because the compliance date contained in the CWA for technology-based requirements has lapsed, the permit writer should require the NMC to be implemented immediately. When the permittee cannot comply with such permit conditions, the permit writer should coordinate with enforcement authority staff to prepare an enforcement order, including a compliance schedule with fixed dates. In accordance with the CSO Control Policy, the NMC should be implemented with appropriate documentation as soon as practicable, but no later than January 1, 1997.

Exhibit 3-3 provides example permit language requiring implementation of the NMC. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. The permit writer must also prepare a fact sheet or statement of basis associated with the implementation of the NMC. The permit writer must show that the permittee's NMC satisfy

Exhibit 3-3. Example Permit Language to Require Immediate Implementation of the Nine Minimum Controls

I. Effluent Limits

A. Technology-based requirements for CSOs. The permittee shall comply with the following technology-based requirements:

1. The permittee shall implement proper operation and maintenance programs for the sewer system and all CSO outfalls to reduce the magnitude, frequency, and duration of CSOs. The program shall consider regular sewer inspections; sewer, catch basin, and regulator cleaning; equipment and sewer collection system repair or replacement, where necessary; and disconnection of illegal connections.

2. The permittee shall implement procedures that will maximize use of the collection system for wastewater storage that can be accommodated by the storage capacity of the collection system in order to reduce the magnitude, frequency, and duration of CSOs.

3. The permittee shall review and modify, as appropriate, its existing pretreatment program to minimize CSO impacts from the discharges from nondomestic users.

   [Alternative language for a permittee without an approved pretreatment program:] The permittee shall evaluate the CSO impacts from nondomestic users and take appropriate steps to minimize such impacts.

4. The permittee shall operate the POTW treatment plant at maximum treatable flow during all wet weather flow conditions to reduce the magnitude, frequency, and duration of CSOs. The permittee shall deliver all flows to the treatment plant within the constraints of the treatment capacity of the POTW.

5. Dry weather overflows from CSO outfalls are prohibited. Each dry weather overflow must be reported to the permitting authority as soon as the permittee becomes aware of the overflow. When the permittee detects a dry weather overflow, the permittee shall begin corrective action immediately. The permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated.

6. The permittee shall implement measures to control solid and floatable materials in CSOs.

7. The permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.

8. The permittee shall implement a public notification process to inform citizens of when and where CSOs occur. The process must include (a) a mechanism to alert persons of the occurrence of CSOs and (b) a system to determine the nature and duration of conditions that are potentially harmful to users of receiving waters due to CSOs.

9. The permittee shall monitor CSO outfalls to characterize CSO impacts and the efficacy of CSO controls. This shall include collection of data that will be used to document the existing baseline conditions, evaluate the efficacy of the technology-based controls, and determine the baseline conditions upon which the long-term control plan will be based. These data shall include:

   a. Characteristics of combined sewer system including the population served by the combined portion of the system and locations of all CSO outfalls in the CSS
   b. Total number of CSO events and the frequency and duration of CSOs for a representative number of events
   c. Locations and designated uses of receiving water bodies
   d. Water quality data for receiving water bodies
   e. Water quality impacts directly related to CSOs (e.g., beach closing, floatables wash-up episodes, fish kills).

the BAT/BCT requirements based on BPJ of the permit writer, considering the factors presented in 40 CFR 125.3(d). These factors include the age of equipment and facilities involved, engineering aspects of the application of various types of control measures, and the reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits achieved. The *Training Manual for NPDES Permit Writers* contains additional details on the use of BPJ in developing permit conditions (EPA, 1993g).

When the permittee is already implementing some or all of the NMC, the permit writer should customize the permit language to address site-specific conditions. For example, if the permittee is already implementing an operation and maintenance (O&M) program, the permit writer might craft language that specifically addresses CSS inspection frequency. If the permittee is already controlling solid and floatable materials, the permit writer may augment the general language to address the specific controls being implemented. Where the permittee has already selected long-term CSO controls, the permit writer should coordinate the development of the permit language requiring NMC implementation with implementation of such controls. This is because some of the control measures might not be appropriate when the selected long-term CSO controls have been implemented (e.g., if a CSO outfall is being eliminated). Section 4.4.2 addresses potential site-specific permit conditions in greater detail. Most importantly, the permit writer should ensure that the permit language reflects the permittee's site-specific conditions, is consistent with the CSO Control Policy, and is enforceable.

It is important to note some additional implementation considerations pertaining to specific minimum controls:

Pretreatment: In the case where the permittee does not have an approved pretreatment program under 40 CFR Part 403, the permit writer should require the permittee to identify its nondomestic users, evaluate the impacts of such users on CSOs, and take steps, as appropriate, to minimize these impacts within the CSS "up-pipe" of the CSOs. Alternative language for this situation is presented in Exhibit 3-3.

Maximizing flow: In developing a permit condition for maximizing flow to the POTW for treatment, the permit writer should consider the secondary treatment regulations in 40 CFR Part 133, which specify numeric effluent limits for biochemical oxygen demand and total suspended solids, as well as a minimum percent removal (85 percent) for secondary treatment. Secondary treatment requirements are enforceable conditions in POTW permits.

Section 133.103(a) and (e) provides relief for POTWs with CSSs that process elevated flows (and more dilute influents) by allowing for the possibility of a waiver of the percent removal requirement. Waivers from effluent concentration limits are not available, however. The decision to apply a waiver and the recalculation of the percent removal are made on a case-by-case basis.

3.4.2 Documentation and Reporting

The Phase I permit should require the permittee to submit documentation demonstrating the implementation of each of the NMC. The CSO Control Policy recommends that the NPDES permitting authority require this documentation to be submitted as soon as practicable but no later than two years after permit issuance. The purpose of the documentation is to 1) verify that the permittee has evaluated, selected, and implemented CSO controls for each of the NMC, 2) document the existing baseline conditions, evaluate the efficacy of the CSO controls after implementation of the NMC, and determine the baseline conditions upon which the LTCP should be developed, and 3) evaluate the degree to which the NMC are sufficient to provide for the attainment of WQS.

The permit should require the permittee to document and report the evaluation and selection of the most appropriate control(s) for each minimum control. Exhibit 3-4 presents example permit language requiring such documentation. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. Exhibit 3-5 and EPA's guidance for nine minimum controls (EPA, 1995b) contain examples of NMC documentation. The permit writer should review the example types of documentation in Exhibit 3-5 and the NMC guidance document and choose the appropriate items to be required in the permit. NMC

Exhibit 3-4. Example Permit Language for Requiring Documentation and Reporting of the Nine Minimum Controls

II. Reporting Requirements A. Reporting implementation of nine minimum controls. The permittee shall submit documentation that demonstrates implementation of each of the nine minimum controls that includes the elements below. The permittee shall submit this documentation to the permitting authority on or before **[insert due date]**. **[insert appropriate list of documentation items]**

documentation may come in a variety of forms. For example, the permittee may submit reports and studies prepared for other purposes, such as operating or facility plans, revised sewer use ordinances, sewer system inspection reports, technical studies, and pollution prevention program plans; public notification plans; and contracts and schedules for minor construction programs for improving the existing system's operation.

The documentation required in the permit should be the minimum amount necessary to demonstrate that appropriate NMC measures are being implemented. In addition, the NPDES permitting authority may choose to require the municipality to keep some records of NMC implementation on site rather than requiring all documentation to be submitted. In these cases, NPDES inspectors can review documentation that is on file during inspections.

Although not reflected in the example permit language in Exhibit 3-4, the permit writer may require periodic reports on the implementation of the NMC throughout the term of the permit. For example, the permit writer may require updates on any significant changes in NMC implementation. In addition, the permit writer may require the submission of monitoring data at a specified frequency throughout the term of the Phase I permit. In any case, the permit language should reflect the permittee's site-specific conditions.

3.5 LONG-TERM CONTROL PLAN

The second major element of the Phase I permit is the requirement to develop an LTCP that will ultimately result in the permittee's compliance with CWA requirements. For this reason, the LTCP should contain CSO controls that are adequate to provide for the attainment

Exhibit 3-5. Example Types of NMC Documentation

Proper operation and regular maintenance programs

An inventory of CSS components requiring routine operation and maintenance
An evaluation of operation and maintenance procedures to include regular inspections; sewer, catch basin, and regulator cleaning; and equipment and sewer collection system repair or replacement where necessary
Copy of, or excerpts from, an operation and maintenance manual and/or procedures for the CSS and CSO structures
Resources allocated (manpower, equipment, training) for maintenance of the CSS and CSO structures
A summary of inspections conducted and maintenance performed

Maximization of use of the sewer collection system for storage

An analysis/study of alternatives to maximize collection system storage
A description of procedures in place for maximizing collection system storage
An implementation schedule of minor construction associated with maximizing collection system storage
Description of actions taken to maximize storage
Identification of existing off-line storage potential
Identification of any additional potential actions to increase storage in the existing collection system, but that require further analysis; documentation that they will be/were evaluated in hydraulic studies conducted as part of the LTCP

Review and modification of controls on nondomestic sources

Results of an inventory of nondomestic discharges and assessment of the impact of such discharges on CSOs
Analysis of feasibility of modifications to nondomestic source controls (including local pretreatment program, if appropriate) to reduce the impact of such discharges on CSOs
Documentation of selected modifications

Maximization of flow to the POTW treatment plant for treatment

Results of any study/analysis of existing conditions and a comparison with the design capacity of the overall facility
Results or status of any engineering studies to increase treatment of wet weather flows
Documentation of actions taken to maximize flow and the magnitude of increase obtained or projected

Elimination of CSOs during dry weather flow conditions

A summary of dry weather overflows that occurred, including location, duration, and frequency
A description of procedures for notifying permitting authority of dry weather overflows
A summary of actions taken to identify dry weather overflows and progress toward eliminating dry weather overflows
A plan for complete elimination of all dry weather overflows

Control of solid and floatable materials in CSOs

An engineering evaluation of procedures or technologies considered for controlling solid and floatable materials
A description of CSO controls in place for solid and floatable materials
A schedule for minor construction
Documentation of any additional controls to be installed or implemented

Exhibit 3-5. Example Types of NMC Documentation (Continued)

Pollution prevention programs to reduce contaminants in CSOs

An evaluation of pollution prevention opportunities to include procedures to control solid and floatable materials
A description of selected pollution prevention opportunities to include resources allocated for implementation
Documentation of pollution prevention program or actions taken

Public notification

An evaluation of public notification options, including description of existing and/or proposed public notification procedures
A description of selected public notification methods
A log of CSO occurrences and associated public notification

Monitoring to characterize CSO impacts and efficacy of CSO controls

An identification of CSO outfalls in the CSS
A summary of CSO occurrences (the number of CSO events and the frequency and duration of CSOs during a representative number of events); monitoring summary for frequency and duration for overflow events may portray a representative number of CSO outfalls
A summary of existing water quality data for receiving water bodies
A summary of receiving water impacts directly related to CSOs (e.g., beach closing, floatables wash-up episodes, fish kills)
An assessment of the effectiveness of any CSO control measures already implemented (e.g., reduction of floatables)
Development of a monitoring plan for the LTCP, as appropriate

of WQS—that is, they will ensure that designated uses are not impaired and the State's water quality criteria are not exceeded. The CSO Control Policy recommends that the permittee develop and submit the LTCP as soon as practicable but generally within two years after the requirement to develop the LTCP is incorporated into a permit, Section 308 information request, or enforcement action. The CSO Control Policy also recognizes that it may be appropriate for the permit writer to establish a longer schedule for completion of the LTCP based on site-specific factors.

The LTCP development process is a comprehensive planning effort designed to evaluate a range of CSO control alternatives and result in the selection of CSO controls that will provide for the attainment of WQS. For this reason, the LTCP development process will be an incremental and, frequently, a sequential process. For example, a permittee should assess the impacts of CSOs on water quality prior to identifying a range of feasible CSO control

alternatives. In establishing the requirements to develop an LTCP, the permit writer should consider the site-specific conditions of the permittee. In a limited number of cases, implementation of the NMC may be sufficient to provide for the attainment of WQS and the permittee's efforts to develop an LTCP should appropriately reflect this situation. In other cases, the permittee may have already begun the CSO planning process and the requirement to develop an LTCP should be tailored to reflect ongoing efforts.

This section provides guidance for the permit writer on how to require development of the LTCP in accordance with the CSO Control Policy. Section 3.5.1 describes each element of the LTCP, Section 3.5.2 presents the schedule for development of the LTCP, and Section 3.5.3 discusses considerations for small systems and ongoing CSO control efforts. EPA's *Combined Sewer Overflows—Guidance for Long-Term Control Plan* contains technical guidance on the development of LTCPs (EPA, 1995a).

3.5.1 Components of the Long-Term Control Plan

The CSO Control Policy outlines the following minimum LTCP components:

- Characterization, monitoring, and modeling of the CSS and receiving waters (including identification of sensitive areas)
- Public participation
- Consideration of sensitive areas
- Evaluation and selection of alternatives
- Cost/performance considerations
- Operational plan
- Maximization of treatment at the POTW treatment plant
- Implementation schedule
- Post-construction compliance monitoring program.

In general, the permit should guide the development of the LTCP consistent with the CSO Control Policy, establishing distinct incremental actions, providing the permittee with flexibility in conducting the planning process, and ensuring enforceability of subsequent Phase II permit conditions.

Exhibit 3-6 provides example permit language requiring the development of an LTCP. This exhibit was intended to provide practical, realistic example language which should not necessarily be considered as boilerplate language. Thus, the permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. The permit conditions in this exhibit include all the components of an LTCP outlined in the CSO Control Policy. The permit writer should list specific LTCP components in the permit rather than simply require the permittee to develop an LTCP consistent with the CSO Control Policy. A permit condition such as, "The permittee shall complete and submit to the permitting authority an LTCP by **[date specified]**..." may result in the submittal of an incomplete or poorly developed plan. Listing the individual components of the plan requires the permittee to consider all of the necessary LTCP components.

The public participation component of the LTCP is discussed first in this section because it is important for the permittee to identify potential stakeholders and formulate a process that will facilitate their active involvement in LTCP development. This should be done as early as possible in the LTCP development process.

3.5.1.1 Public Participation

Under the CSO Control Policy, the permittee should employ a public participation process that actively involves the affected public in the decision-making to select the long-term CSO control(s). According to the CSO Control Policy, the affected public includes rate payers, industrial users of the sewer system, persons who live adjacent to or use water bodies affected by CSOs, and any other interested persons. Public participation is critical to the ultimate success of the CSO controls selected by the permittee, given the potential financial impact (e.g., increased fees) to the affected public. Early and constant public participation during the

Exhibit 3-6. Example Permit Language for Requiring the Development of a Long-Term Control Plan

III. Long-Term Control Plan

The permittee shall develop a long-term control plan that will include the elements contained in Sections III.A through III.D below and shall submit the plan elements in accordance with the schedule contained in Section III.E:

A. Public Participation

The permittee shall prepare and implement a public participation plan that outlines how the permittee will ensure participation of the public throughout the long-term control plan development process.

B. CSS Characterization

The permittee shall develop and implement a plan that will result in a comprehensive characterization of the CSS developed through records review, monitoring, modeling, and other means as appropriate to establish the existing baseline conditions, evaluate the efficacy of the CSO technology-based controls, and determine the baseline conditions upon which the long-term control plan will be based. The characterization shall adequately address the response of the CSS to various precipitation events; identify the number, location, frequency, and characteristics of CSOs; and identify water quality impacts that result from CSOs.

To complete the characterization, the permittee shall employ the following methods:

1. Rainfall Records Review. The permittee shall examine the complete rainfall records for the geographic areas of the CSS and evaluate the flow variations in the receiving water body to correlate between the CSOs and receiving water conditions.

2. CSS Records Review. The permittee shall review and evaluate all available CSS records and undertake field inspections and other necessary activities to identify the number, location, and frequency of CSOs and their location relative to sensitive areas (as identified in III.B.4) and to pollution sources, such as significant industrial users, in the collection system.

3. CSO and Water Quality Monitoring. The permittee shall develop and submit a monitoring program that measures the frequency, duration, flow rate, volume, and pollutant concentration of CSOs and assesses the impact of the CSOs on receiving waters. Monitoring shall be performed at a representative number of CSOs for a representative number of events. The monitoring program shall include CSOs and ambient receiving water body monitoring and, where appropriate, other monitoring protocols, such as biological assessments, toxicity testing, and sediment sampling.

4. Identification of Sensitive Areas. The permittee shall identify sensitive areas to which its CSOs occur. These areas shall include Outstanding National Resource Waters, National Marine Sanctuaries, waters with threatened or endangered species and their designated critical habitat, waters with primary contact recreation, public drinking water intakes or their designated protection areas, shellfish beds, and any other areas identified by the permittee or permitting authority, in coordination with appropriate State or Federal agencies.

5. CSS and Receiving Water Modeling. The permittee may employ models, which include appropriate calibration and verification with field measurements, to aid in the characterization. If models are used, they shall be identified by the permittee along with an explanation of why the model was selected and used in the characterization.

Exhibit 3-6. Example Permit Language for Requiring the Development of a Long-Term Control Plan (continued)

C. CSO Control Alternatives

1. Development of CSO Control Alternatives. The permittee shall develop a range of CSO control alternatives that would be necessary to achieve **[insert appropriate range of levels of control (e.g., zero overflow events per year, an average of 1 to 3, 4 to 7, and 8 to 12 overflow events per year)]**. The permittee shall consider expansion of the POTW treatment plant secondary and primary capacity as an alternative.

   Alternatives presented must give the highest priority to controlling CSOs to the sensitive areas identified in III.B.4 above. For such areas, the alternatives included in the plan must (1) prohibit new or significantly increased CSOs, (2) eliminate or relocate CSOs from such areas wherever physically possible and economically achievable, except where elimination or relocation would provide less environmental protection than additional treatment, (3) where elimination or relocation is not physically possible or economically achievable or would provide less environmental protection than additional treatment, provide the level of treatment for remaining CSOs deemed necessary to meet water quality standards for full protection of existing and designated uses.

2. Evaluation of CSO Control Alternatives. The permittee shall evaluate each of the alternatives developed in accordance with III.C.1 to select the CSO controls that will ensure compliance with CWA requirements.

3. Cost/Performance Considerations. The permittee shall develop and submit cost/performance curves that demonstrate the relationship among the set of CSO control alternatives that correspond to the ranges identified in III.C.1 above.

D. Selected CSO Controls

Once the permittee has selected the CSO controls in consultation with the permitting authority, the permittee shall submit the following:

1. Implementation Schedule. The permittee shall submit a construction schedule for the selected CSO controls as part of the implementation schedule. Such schedules may be phased based on the relative importance of the adverse impacts on water quality standards and on the permittee's financial capability.

2. Operational Plan. The permittee shall submit a revised operation and maintenance plan that addresses implementation of the selected CSO controls. The revised operation and maintenance plan shall maximize the removal of pollutants during and after each precipitation event using all available facilities within the collection and treatment system.

3. Post-Construction Compliance Monitoring Program. The permittee shall develop and submit a post-construction monitoring program that (a) is adequate to ascertain the effectiveness of the CSO controls and (b) can be used to verify attainment of water quality standards. The program shall include a plan that details the monitoring protocols to be followed, including CSO and ambient monitoring and, where appropriate, other monitoring protocols, such as biological assessments, whole effluent toxicity testing, and sediment sampling.

E. Schedule and Interim Deliverables

The following reports shall be developed in accordance with the requirements specified in Sections III.A through III.D and submitted to the permitting authority by the dates specified below:

1. Public Participation Plan, as required in Section III.A, shall be submitted on or before **[insert due date]**.

2. CSS Characterization Monitoring and Modeling Plan, as required in Section III.B, shall be submitted on or before **[insert due date]**.

Exhibit 3-6. Example Permit Language for Requiring the Development of a Long-Term Control Plan (continued)

3. CSS Characterization Monitoring and Modeling Results, including identification of sensitive areas, as required in Section III.B, shall be submitted on or before **[insert due date]**.
4. CSO Control Alternatives Identification, as required in Section III.C.1, shall be submitted on or before **[insert due date]**.
5. CSO Controls Evaluation and Cost Performance Curves for the selected CSO controls, as required in Sections III.C.2 and 3, shall be submitted on or before **[insert due date]**.
6. Implementation Schedule, as required in Section III.D.1, including any supporting analyses, shall be submitted on or before **[insert due date]**.
7. Operational Plan revised to reflect selected CSO controls, as required in Section III.D.2, shall be submitted on or before **[insert due date]**.
8. Post-Construction Compliance Monitoring Plan, as required in Section III.D.3, shall be submitted on or before **[insert due date]**.

development, evaluation, and selection of CSO controls should reduce the potential for delays in the development of the plan, evaluation of control alternatives, and implementation of selected CSO controls, and reduce the risk of unnecessary expenditure of resources by the permittee.

The permittee should be required to prepare and implement a public participation plan. Among the permit writer's options for requiring public participation as a part of LTCP development are the following:

- Requiring the development of a public participation plan at the beginning of the planning process that describes how the public will be involved throughout the process of developing the LTCP. In some cases, the permit writer may want to require the plan to be submitted to the NPDES permitting authority for review. EPA recommends this approach. Example permit language is provided in Exhibit 3-6.

- Generally requiring public participation and periodic reporting of the actual public involvement activities. Alternatively, the permit writer may require reporting at the end of the planning process when the permittee submits its final LTCP.

Regardless of the approach selected, the permit writer may want to specify the type of documentation that should be maintained on public involvement. For example, acceptable documentation may include records of public meetings (including the date, time, location, approximate number of people attending, and key issues), although meeting transcripts would

not necessarily be required. Acceptable documentation may also include summaries of public comments received.

3.5.1.2 Characterization, Monitoring, and Modeling of the CSS and Receiving Waters

Characterization, monitoring, and modeling activities provide the basis for the permittee to choose and design effective CSO controls. According to the CSO Control Policy, the major elements include:

- Examination of rainfall records
- Characterization of the CSS
- Monitoring of CSOs and receiving water quality
- Modeling of the CSS and the receiving water.

As discussed in Section 3.7, initial characterization and monitoring activities are conducted under one of the NMC (monitor to effectively characterize CSO impacts and efficacy of CSO controls). If the permittee has already characterized its CSS, CSOs, and impacts on receiving waters, permit requirements for further characterization may not be necessary (although long-term compliance monitoring will still be necessary, as discussed in Section 3.5.1.9). If the permittee has not sufficiently characterized the system, the permit writer should determine whether further efforts are needed and establish permit conditions that specify the characterization activities necessary to adequately complete this component of the LTCP. EPA's *Combined Sewer Overflows—Guidance for Monitoring and Modeling* (EPA, 1995d) and *Combined Sewer Overflows—Guidance for Long-Term Control Plan* (EPA, 1995a) present technical guidance related to proper CSS characterization.

EPA recommends that the permit writer require the permittee to develop a characterization and monitoring plan that includes the monitoring protocols, procedures, and associated time periods for collection of data that will be used to characterize the CSS and receiving waters. (Section 3.5.2 discusses submittal of the plan and other interim deliverables.) This characterization and monitoring plan should be reviewed by the NPDES permitting

authority, State WQS authority, and EPA Region. As part of this review, these parties should agree on the data, information, and analyses needed to support the development of the LTCP and the review and revisions to WQS and implementation procedures to reflect site-specific wet weather conditions, if appropriate. In addition, the permittee's proposed characterization and monitoring plan should be coordinated with other monitoring efforts within the same watershed. Review and concurrence by these participants should ensure that the permittee collects adequate but not unnecessary characterization and monitoring data.

3.5.1.3 Consideration of Sensitive Areas

Sensitive areas should be identified as part of the CSS characterization as soon as the locations of all CSO outfalls are known. The CSO Control Policy indicates that sensitive areas should be given priority during LTCP development (see discussion in next section). Examples of sensitive areas are provided in the CSO Control Policy and listed in Exhibit 3-7.

Exhibit 3-7. Sensitive Areas Identified in the CSO Control Policy

- Outstanding National Resource Waters
- National Marine Sanctuaries
- Waters with threatened or endangered species
- Waters with primary contact recreation (e.g., swimming)
- Public drinking water intakes
- Shellfish beds

The *initial* identification of sensitive areas should be made by the permittee in consultation with the NPDES permitting authority and may require coordination with local, State, and Federal agencies involved in the protection of such areas. For example, the permittee and permit writer should:

- Coordinate with the U.S. Fish and Wildlife Service to determine whether CSOs occur in waters with threatened or endangered species.
- Coordinate with the local public water utility to ensure the designation of drinking water sources as sensitive areas.

- Evaluate the designated uses of each CSO receiving water because the State might have a designated use that corresponds to a sensitive area as defined by the CSO Control Policy.

The NPDES permitting authority will make the final determination of sensitive areas.

Once sensitive areas have been identified, the permit should require the permittee to give the highest priority to controlling overflows to these areas. Permit conditions should require the LTCP to 1) prohibit new or significantly increased overflows to sensitive areas, 2) eliminate or relocate overflows that discharge to sensitive areas wherever physically possible and economically achievable (except where elimination or relocation would provide less environmental protection than additional treatment), or 3) where elimination or relocation is not physically possible and economically achievable, or would provide less environmental protection than additional treatment, provide the level of treatment for remaining overflows deemed necessary to meet WQS for full protection of existing and designated uses.

Section III.C.1 of Exhibit 3-6 contains example permit language requiring the permittee to consider sensitive areas during LTCP development.

3.5.1.4 Evaluation of Control Alternatives

The primary objective of the LTCP is to evaluate CSO control alternatives that will enable the permittee, in consultation with the NPDES permitting authority, the WQS authority, and the public, to select CSO controls that will meet CWA requirements. To ensure that the most cost-effective and protective CSO controls are selected, the permit writer should require the permittee to consider a reasonable range of CSO control alternatives. The CSO Control Policy encourages the permittee to evaluate CSO control alternatives that provide varying levels of control such as those that would achieve:

- **Example 1**

  - Zero overflow events per year (i.e., total elimination of CSOs via storage and/or sewer separation)
  - An average of 1 to 3 overflow events per year
  - An average of 4 to 7 overflow events per year
  - An average of 8 to 12 overflow events per year.

- **Example 2**

  - Controls that achieve 100-percent capture for treatment
  - Controls that achieve 90-percent capture for treatment
  - Controls that achieve 85-percent capture for treatment
  - Controls that achieve 80-percent capture for treatment
  - Controls that achieve 75-percent capture for treatment.

The permittee should develop an appropriate range of control alternatives based on site-specific conditions.

The CSO control alternatives could include total sewer separation or retention of all combined sewer flows for subsequent treatment during dry weather. The CSO control alternatives also could include a combination of controls for an entire system (e.g., partial sewer separation and retention). In addition, the permittee should consider, among its CSO control alternatives, expanding POTW treatment plant secondary and primary capacity and associated appurtenances to enable additional treatment of combined sewage. Thus, the Phase I permit should require the permittee to evaluate the maximization of treatment at the POTW treatment plant among its CSO control alternatives. EPA's guidance on LTCPs contains additional technical guidance on evaluating CSO control alternatives (EPA, 1995a).

The evaluation of alternatives will ultimately enable the permittee to select CSO controls, in consultation with the NPDES permitting authority, WQS authority, and the public, that, when implemented, will comply with water quality-based requirements of the CWA either through the "presumption approach" or the "demonstration approach." It is unlikely that a permittee or a permit writer will be able to determine the level of control necessary to meet WQS requirements prior to the initiation of the LTCP planning process. Similarly, a permittee will probably not

be able to specifically adopt either the presumption or demonstration approach until after the initial planning process has begun and more is known about its CSS and CSOs. These two approaches (contained in the CSO Control Policy) are described in the following discussion.

Presumption Approach

The presumption approach presumes that the CSO controls necessary to meet the performance criteria presented in the CSO Control Policy will be sufficient to meet the water quality-based requirements of the CWA. The permittee may consider the presumption approach where the level of control needed to protect WQS is unknown, but the permit writer and permittee agree the approach is reasonable based on the data and analysis conducted as part of the characterization. This approach is based on the permittee meeting one of the following criteria presented in the CSO Control Policy:

- No more than an average of four overflow events per year, provided that the NPDES permitting authority may allow up to two additional overflow events per year. Thus, the permit writer may allow four, five, or six overflow events per year. For the purpose of this criterion, the CSO Control Policy defines an overflow event as "one or more overflows from a CSS as the result of a precipitation event that does not receive the minimum treatment specified below."

- The elimination or capture for treatment (as treatment is specified below) of no less than 85 percent by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis. To determine the volume of combined sewage that must be captured or eliminated, the permittee should calculate the total volume entering the combined sewer during precipitation events on a system-wide annual average basis.

- The elimination or reduction of no less than the mass of pollutants identified as causing WQS exceedances through the sewer system characterization, monitoring, and modeling effort for the volume(s) that would be eliminated or captured for treatment, as described under the previous bullet. Again, the permittee, in consultation with the permit writer, should determine the appropriate volume of combined sewage to be treated. In addition, the permittee, in consultation with the permit writer, should identify the specific pollutants and their masses to be eliminated or reduced.

For purposes of the first two criteria above, all combined sewer flows in the CSS remaining after implementation of the NMC should be required to receive the following minimum treatment:

- Primary clarification (or equivalent) for the removal of floatables and settleable solids
- Solids and floatables disposal
- Disinfection of effluent, if necessary, to meet WQS and protect human health, including removal of harmful disinfection chemical residuals, where necessary to meet WQS.

For example, if the permittee chooses to capture 85 percent by volume of the combined sewage collected on a system-wide annual basis during precipitation events, these flows should receive the treatment listed previously. The remaining 15 percent by volume should receive treatment to the greatest extent practicable, and this should be addressed in the operational plan. For example, in considering what type of treatment constitutes "to the greatest extent practicable," the permittee may evaluate whether attaching nets as end-of-pipe controls for solid and floatable materials in the remaining 15 percent is achievable within technical and financial constraints.

As stated in the CSO Control Policy, the controls selected under the presumption approach are only "presumed" to meet the water quality-based requirements of the CWA "...provided the permitting authority determines that such presumption is reasonable in light of the data and analysis conducted in the characterization, monitoring and modeling of the system and the consideration of sensitive areas...." Therefore, the selected CSO control program should be designed to allow for cost-effective expansion or cost-effective retrofitting if additional controls are subsequently determined to be necessary to meet WQS.

Demonstration Approach

As an alternative to the presumption approach, the permittee may choose to demonstrate that the selected CSO controls, when implemented, will be adequate to comply with the water

quality-based CWA requirements. An adequate demonstration should include each of the following:

- The planned control program is adequate to provide for attainment of WQS unless WQS cannot be attained as a result of natural background conditions or pollution sources other than CSOs.
- The CSOs remaining after implementation of the planned control program will not preclude the attainment of WQS. If WQS are not met in part because of natural background conditions or pollution sources other than CSOs, a total maximum daily load (TMDL), including a wasteload allocation for point sources, a load allocation for nonpoint sources, and a margin of safety, should be used to apportion pollutant loads to all source discharges.
- The planned control program will provide the maximum pollution reduction benefits reasonably attainable including the cost/performance considerations below.
- The planned control program is designed to allow cost-effective expansion or cost-effective retrofitting if additional controls are subsequently determined to be necessary to meet WQS.

It is important to note some additional considerations pertaining to use of the demonstration approach:

Natural Background Conditions: The decision as to whether natural background conditions preclude attainment of WQS is made during the WQS-setting process by the WQS authority. "Natural background conditions" of a receiving water body include both naturally occurring pollutant concentrations and channel and instream characteristics (e.g., mean stream width and depth, total volume, flow and water velocity, reaeration rates, seasonal changes, turbidity, suspended solids, temperature, sedimentation, and channel stability, obstructions, or changes).

Decisions regarding pollutant sources other than CSOs, on the other hand, are made during the development of wasteload allocations during the TMDL process. Other "pollution sources" to a receiving water body could include additional municipal or industrial point source

dischargers, including facilities or operations with storm water discharges, and nonpoint sources, such as agricultural and roadway runoff or drainage from abandoned mines.

TMDL: A TMDL is a technically sound and legally defensible tool used by a State to calculate and apportion to identified sources the allowable amounts of pollutants that may be discharged into the water body without exceeding numeric criteria or another quantifiable endpoint (e.g., temperature, riparian habitat). The use of a TMDL to apportion pollutant loads is illustrated by the following example:

> *A river segment at the lower end of a watershed is not meeting its designated use because of excessive concentration of one particular metal. Studies determined that sources of the metal include a metal finishing plant (300 kg/yr), a POTW (200 kg/yr), drainage from an abandoned mine (400 kg/yr), CSOs (500 kg/yr), and atmospheric deposition (5 kg/yr). The metal finishing plant is meeting its technology-based permit limits and little reduction in metal loadings can be anticipated without expensive upgrades. No further reductions in loadings can be achieved by the POTW without expensive upgrades. The mine drainage can be treated using BMPs to remove 75 percent of the metal (leaving 100 kg/yr). Design changes to the CSS will reduce the metal loadings to 50 kg/yr.*
>
> *Modeling analyses would then be conducted, and a margin of safety would be identified to accommodate potential new development or lack of certainty in the modeling analysis. If this modeling indicates that the resulting WQS for the particular metal can be achieved through implementation of those allocations (including the margin of safety), the analysis constitutes a TMDL. The TMDL should then be submitted to EPA for review under CWA Section 303(d).*

To help ensure that the demonstration by the permittee will be adequate, the permit writer should consider defining how the above criteria for "adequate demonstration" will be met. If the NPDES permitting authority has particular policies or procedures for evaluating water quality impacts, then the permit writer should place these requirements in the permit.

If natural background conditions or pollution sources other than CSOs are contributing to exceedances of WQS, then the permit writer should coordinate with the appropriate State authorities to determine whether a TMDL has been developed or is in the process of being developed for the watershed in which the permittee is located. Effluent limitations for the CSO outfall must be consistent with any WLA for that CSO prepared by the State and approved by EPA pursuant to 40 CFR 130.7. (See 40 CFR 122.44(d)(1)(vii)(B).) The permittee should demonstrate compliance with such WLA. In the absence of a TMDL for a pollutant or pollutants, the permit writer should coordinate with appropriate State water quality personnel to determine how a permittee will demonstrate compliance with WQS in light of the other source of pollutants.

Under the demonstration approach, the permit writer also should specify clearly what will constitute a reasonable effort by the permittee to demonstrate the maximum pollution reduction benefits reasonably attainable. Maximum pollution reduction that is "reasonably attainable" is the reduction that can be realized through the implementation of CSO controls determined to be feasible for the individual permittee, recognizing factors such as the nature of the individual CSS, the characteristics of the receiving water body, and other factors specific to the CSO and receiving water body.

To provide an adequate demonstration, the permittee should rely upon data collected both during monitoring done as part of NMC implementation and the characterization, monitoring, and modeling completed during the initial stages of LTCP development. Using these data, the permittee should establish that its selected CSO controls will satisfy each of the demonstration criteria.

3.5.1.5 Cost/Performance Considerations

The permit writer should require the permittee to develop and submit with the LTCP appropriate cost/performance curves for each of the CSO control alternatives being evaluated. The permittee develops the curves to demonstrate the relationship between the anticipated effectiveness of CSO control alternatives being considered and the cost of each. Consistent with

the CSO Control Policy, the permittee should be required to include an analysis discussing the point at which the increment of pollution reduction achieved in the receiving water diminishes compared to increased costs (i.e., a "knee of the curve" analysis). The permit writer may also want to require the permittee to evaluate the environmental benefits associated with the cost/ performance curves (e.g., the reduction in the number of days per year that the receiving water exceeds State bacteriological WQS). These analyses will ultimately help guide the selection of CSO controls by the permittee, NPDES permitting authority, WQS authority, and the public. EPA's guidance on LTCPs contains detailed information related to the development and review of cost/performance curves (EPA, 1995a).

3.5.1.6 Operational Plan

The Phase I permit should generally include a requirement that, once the appropriate CSO controls are selected, the permittee will revise the O&M plan developed as part of the NMC to include the selected CSO controls. The operational plan, as it incorporates the O&M program implemented as part of the NMC, will reduce the magnitude, frequency, and duration of CSOs. As described in the CSO Control Policy, the operational plan should be designed to maximize the removal of pollutants during and after each precipitation event using all available facilities within the collection and treatment system. The operational plan should also specify methods to ensure that any flows in excess of the volumes prescribed under the presumption approach (e.g., flows in excess of 85 percent by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis) receive treatment to the greatest extent practicable. EPA's guidance on LTCPs presents additional information on technical considerations in revising an O&M program (EPA, 1995a).

3.5.1.7 Maximization of Treatment at the POTW Treatment Plant

As discussed in Section 3.5.1.4 (Evaluation of Control Alternatives), the permittee should evaluate the maximization of treatment **at the POTW treatment plant** as part of the LTCP. As a component of the LTCP, maximization of treatment at the treatment plant is envisioned to include the use of existing primary excess wet weather flow capacity rather than the construction of additional treatment capacity. However, as part of evaluating whether the use of existing

primary capacity is an appropriate long-term alternative, the permittee should evaluate the feasibility of expanding either primary treatment capacity or both primary and secondary treatment capacities.

This component of the LTCP is distinguished from **maximization of flow to the POTW for treatment,** one of the NMC. The minimum control focuses on maximizing flow through the treatment plant so that the combined sewage flow can receive secondary treatment. Thus, this minimum control takes advantage of existing secondary treatment capacity.

As stated in the CSO Control Policy, maximization of treatment has two benefits:

- Treatment of increased flows during wet weather may enable the permittee to minimize overflows to sensitive areas
- Combined sewer flows would receive at least primary treatment.

In addition, use of existing primary treatment capacity at the treatment plant may prove to be a cost-effective alternative based on the cost/performance analyses of CSO control alternatives.

If a permittee determines during its LTCP development that utilization of excess primary treatment capacity is a feasible long-term CSO control, the permit writer will need to consider authorization of a CSO-related bypass for the permittee. Section 4.9.1 contains a detailed discussion of CSO-related bypass, which is likely to be addressed in the special conditions section of the Phase II permit.

3.5.1.8 Implementation Schedule

The permit should require the permittee to develop a schedule that will ensure timely implementation of the selected CSO controls. The proposed CSO implementation schedule should include construction schedules, financing plans, and milestones for any other permitting requirements (e.g., environmental reviews, siting of facilities, site acquisition, and Army Corps

of Engineers permits). These schedules may be phased depending on the following environmental and financial factors:

- Elimination of CSOs to sensitive areas as the highest priority
- Use impairment of receiving water
- Permittee's financial capability, including consideration of such factors as:
  - Median household income
  - Total annual wastewater and CSO control costs per household as a percent of median household income
  - Overall net debt as a percent of full market property value
  - Property tax revenues as a percent of full market property value
  - Property tax collection rate
  - Unemployment
  - Bond rating
- Grant and loan availability
- Previous and current residential, commercial, and industrial sewer user fees and rate structures
- Other viable funding mechanisms and sources of financing.

EPA's guidance documents on LTCPs (EPA, 1995a) and financial capability assessment (EPA, 1995e) contain information on scheduling and financial capability.

3.5.1.9 Post-Construction Compliance Monitoring Program

The post-construction compliance monitoring plan should be submitted by the permittee as part of the LTCP and reviewed by the permit writer (see Section 4.5.2). The permit writer should require that this plan detail the monitoring protocols and associated schedules (including the duration of the different monitoring activities). The monitoring protocols should include the necessary effluent and ambient monitoring and, where appropriate, biological assessments, whole effluent toxicity testing, and sediment sampling.

The monitoring plan should include ambient monitoring at locations appropriate to determine the full range of CSO impacts on the water body. The types of pollutants and parameters to be analyzed, which will depend on the WQS in the receiving water body, might include chemical (e.g., biochemical oxygen demand, total suspended solids, metals, oil and grease, herbicides, and pesticides), physical (e.g., temperature, turbidity, sedimentation), and biological (e.g., fish, benthic invertebrates, and zooplankton) parameters. The monitoring should be coordinated with any ongoing or planned State monitoring programs and programs of other permittees within the same watershed.

The permit writer should encourage the permittee to develop appropriate measures of success as part of its monitoring plan. The permittee's measures of success should be based on site-specific circumstances. Section 2.8 discusses potential measures of success for the CSO program.

Because construction of the selected CSO controls may extend over several permit terms, it might be appropriate to defer all or some requirements for development of the post-construction monitoring plan to later permits when construction of the CSO controls is complete. The permit writer may also consider requiring the permittee to conduct certain types of monitoring (e.g., for specified parameters) for the duration of the permit and other monitoring for a time period shorter than the permit term. EPA's guidance for monitoring and modeling presents information on the development of a post-construction compliance monitoring program (EPA, 1995d).

3.5.2 Schedule for Development of the Long-Term Control Plan

The permit writer should establish a deadline for completing and submitting the LTCP. According to the CSO Control Policy, this deadline should be within two years of the effective date of the Phase I permit or other implementation mechanism (such as an enforcement order). As stated in the CSO Control Policy, the permit writer may extend the two-year deadline on a case-by-case basis to account for site-specific factors that might complicate the planning process

for the permittee. A schedule for completion of the LTCP should be included in an appropriate enforceable mechanism.

The permit writer should also consider establishing a periodic reporting schedule that requires the permittee to report on progress related to LTCP development. These progress reports should describe progress made to date on each of the primary LTCP components, identify problems that might affect completion of the LTCP, and describe remedial measures to be taken when necessary. Depending on the specific circumstances and complexity of the CSS, a permit writer may require submission of progress reports on a regular basis (e.g., quarterly, biannually), customize the schedule to track critical path components (e.g., to ensure public participation occurs early in the process or that CSS characterization is proceeding), or require the submission of progress reports at the completion of each component of the LTCP.

In addition to progress reports, the permit writer should consider establishing interim deadlines and deliverables for various components of the LTCP to ensure that the permittee is making adequate progress during the term of the permit. Example permit language requiring the submission of interim deliverables is provided in Exhibit 3-5, presented earlier. The submission of interim deliverables prior to completion of the LTCP gives the permit writer and other key participants, such as WQS authorities, an opportunity to review critical components of the LTCP early in the planning process and avoid delays in issuing the Phase II permit due to the submission of inadequate information or analyses. Generally, EPA expects the permit writer to receive the following interim deliverables prior to completion of the LTCP:

- Public participation plan
- CSS characterization, monitoring, and modeling plan
- CSS characterization, monitoring, and modeling results, including identification of sensitive areas
- Identification of CSO control alternatives
- Evaluation of CSO control alternatives and cost/performance curves

- Operational plan
- Proposed implementation schedule, including supporting analyses
- Post-construction compliance monitoring plan.

Upon receipt of an interim deliverable, the permit writer should work closely with the permittee to ensure that any inadequacies or other issues are addressed prior to submittal of the final LTCP and issuance of the Phase II permit. Section 3.10 provides more detail on the responsibilities of the permit writer while reviewing interim deliverables.

The specific deadlines in the permit or other enforceable mechanism will depend on the circumstances of the CSS being permitted. For example, if a permit writer requires the development of a public participation plan, the permit writer should impose deadlines for completion of the plan and, after review by the NPDES permitting authority, for its implementation. In other cases, the information, such as CSS characterization data needed to identify sensitive areas, might not be available prior to issuance of the Phase I permit. Due to the importance of evaluating alternatives to protect sensitive areas, the permit writer should establish a deadline for the submission of information on sensitive areas early in the LTCP development process.

3.5.3 Considerations for Previous or Ongoing CSO Control Efforts and Small Combined Sewer Systems

Generally, the permit writer should consider two special factors when establishing the requirements to develop the LTCP: the permittee's previous efforts to control CSOs and the limited resources of small communities.

3.5.3.1 Recognition of Previous or Ongoing Efforts at Controlling CSOs

The permit writer will probably determine that municipalities are at different stages of CSO characterization and CSO control implementation. Some municipalities might have already

begun planning, monitoring, and implementing CSO controls in response to EPA's 1989 CSO Control Strategy and other initiatives.

The CSO Control Policy recommends that the permit writer consider, on a case-by-case basis, the following efforts that a permittee might have undertaken prior to Phase I permitting: 1) substantial completion of construction of CSO controls that appear to provide for attainment of WQS, 2) CSO control programs substantially developed or implemented pursuant to existing permits or enforcement orders, and 3) previous construction of CSO control facilities designed to provide for attainment of WQS but where WQS have not been attained due to remaining CSOs.

If the permit writer has determined that the permittee has "substantially completed" construction of projects designed to provide for attainment of WQS, the permit conditions for LTCP development may be modified to reflect these efforts. The permit writer may choose not to require the initial planning and construction provisions of the LTCP. The permittee, however, should be required to complete the relevant components of the LTCP that might not have been addressed by the permittee's previous efforts or that represent ongoing commitments, including development of an O&M program and post-construction compliance monitoring plan. If subsequent monitoring shows that the WQS are **not** being attained and CSOs continue to contribute to the impairment of designated uses or exceedances of water quality criteria, notwithstanding efforts to coordinate with WQS authorities, then an enforceable order should require a revised/amended LTCP, and the permit should be modified as appropriate.

If the permittee has substantially developed or is implementing a CSO control program pursuant to an existing permit or enforcement order but has not completed construction of the selected CSO controls, and the control program is expected to provide for attainment of WQS and is consistent with the objectives of the CSO Control Policy, the permit requirements should be modified to require evaluation of sensitive areas and financial capabilities, as well as development of a post-construction monitoring plan.

If the permittee has previously constructed CSO facilities in an effort to attain WQS but has failed to meet the applicable standards because remaining CSOs are not sufficiently controlled, the permit writer may consider these previous efforts when identifying further CSO control planning activities. The previous construction of CSO control facilities, although not yet attaining WQS, may mitigate the need to complete each step in the LTCP. In some cases, a permit writer may need to require the development of a complete, although abbreviated, LTCP (e.g., further CSS characterization might be needed or other alternative CSO controls identified and costs and funding mechanisms developed).

3.5.3.2 Small System Considerations

The CSO Control Policy acknowledges that portions of the LTCP may prove to be difficult to implement for small municipalities and recommends that for CSSs in jurisdictions with populations under 75,000, the permit requirement to develop the LTCP should reflect the capabilities of such "small" jurisdictions. The permit writer should ensure that the permittee has gathered enough information to implement effective CSO controls. The permit requirements for developing a plan should include consideration of sensitive areas, public participation in the selection of the CSO controls, and a post-construction compliance monitoring program sufficient to determine whether WQS are attained. Thus, for jurisdictions with populations less than 75,000, the permit writer may use discretion in deciding not to include specific requirements for the following components of the LTCP: system characterization, monitoring and modeling; evaluation and selection of alternatives (including cost/performance analyses); operational plan; maximization of treatment at the POTW treatment plant; and implementation schedule. Overall, the permit writer should be aware that a delicate balance needs to be achieved between resources spent on monitoring and modeling and resources spent on implementation of controls.

3.6 EFFLUENT LIMITATIONS

The CWA requires that technology-based effluent limitations be established for all point source discharges. In addition, a point source may also be subject to more stringent limitations, including those necessary to meet WQS. During Phase I permitting, the permit writer should establish technology-based requirements and any other limitations necessary to meet WQS in the

form of narrative requirements since he or she will probably not have sufficient data or information to establish numeric effluent limitations. During subsequent CSO permitting phases, as data and information related to the CSOs and CSO controls implemented by permittees improve, it may be appropriate to develop numeric effluent limitations.

3.6.1 Technology-Based Requirements

Section 301 of the CWA requires effluent reductions based on various degrees of control technology for all discharges of pollutants. For existing nonmunicipal dischargers, these technology-based effluent limitations must reflect BAT/BCT for toxic, conventional, and nonconventional pollutants.

NPDES regulations at 40 CFR 122.44(a) require the establishment of technology-based effluent limitations for pollutants of concern discharged by point sources that will be regulated under an NPDES permit. Although CSOs are subject to technology-based requirements, they are not subject to secondary treatment standards applicable to POTWs. According to 40 CFR 125.3(c), in the absence of national effluent guidelines and standards for point source discharges, technology-based effluent limitations are to be established on a case-by-case basis using the permit writer's BPJ.

The CSO Control Policy recommends the use of the NMC, in the form of best management practices (BMPs), as the technology-based requirements for CSOs. The use of BMPs in lieu of numeric technology-based effluent limitations is allowed under 40 CFR 122.44(k)(2) where it is infeasible to calculate a numeric limit. BMPs are considered particularly applicable for CSOs because the types, concentrations, and quantities of pollutants expected from a precipitation event are generally unpredictable.

As stated in the CSO Control Policy, Phase I permits should at least require the permittee to "immediately implement BAT/BCT, which includes the nine minimum controls, as determined on a BPJ basis by the permitting authority." Thus, where the permit writer determines on a BPJ basis that the implementation of the NMC in Phase I and Phase II permits meets the technology-

based requirements, he or she should not need to develop numeric technology-based effluent limitations. Exhibit 3-3, presented previously, provides example permit language requiring implementation of the NMC.

If the permit writer determines that numeric technology-based effluent limitations are warranted for CSOs, EPA's *Training Manual for NPDES Permit Writers* (EPA, 1993) should be consulted for guidance on developing limits on a case-by-case basis using BPJ. Although this EPA manual is intended to address continuous discharges, it may provide useful information for wet weather flows.

3.6.2 Water Quality-Based Requirements

Section 301(b)(1)(C) of the CWA and NPDES regulations at 40 CFR 122.44(d) require that NPDES permits contain water quality-based effluent limitations for all discharges that cause, contribute to, or have the potential to cause an exceedance of a numeric or narrative water quality standard.

EPA expects that it will be extremely difficult in the early stages of permitting to determine whether numeric water quality-based effluent limitations are necessary. This is due to many factors including the lack of point source and ambient data for conventional, toxic, and nonconventional pollutants of concern. Thus, it is likely to be very difficult or inappropriate for the permit writer, at this point, to "back-calculate" effluent limits based on WQS.

As described in the CSO Control Policy, Phase I permits should at least require that the permittee immediately comply with applicable WQS expressed in the form of a narrative limitation. Such a requirement to comply with narrative WQS is justified for CSOs if, prior to the development of the LTCP, sufficient data are not available to evaluate the need for numeric water quality-based effluent limits.

Exhibit 3-8 provides example permit language requiring compliance with narrative WQS. The specific narrative standards a permit writer should include as permit conditions will depend

on, and should be consistent with, State WQS. All State WQS have narrative criteria that address aesthetic qualities (e.g., all waters shall be free from discharges that settle to form objectionable deposits). Although State narrative standards can be incorporated into the permit by reference, EPA recommends that the permit writer include the specific narrative language in the permit to ensure that the permittee understands exactly what standards it must meet.

Exhibit 3-8. Example Permit Language for Requiring Compliance with Narrative Water Quality Standards

I. Effluent Limits

B. Water quality-based requirements for CSOs.
The permittee shall not discharge any pollutant at a level that causes or contributes to an in-stream excursion above numeric or narrative criteria developed and adopted as part of **[insert State name]** water quality standards.

Site-Specific Language:

1. *The permittee shall not discharge any floating debris, oil, grease, scum, foam, or other objectionable materials that may result in amounts sufficient to be unsightly or otherwise objectionable or to constitute a nuisance under State law.*

2. *The permittee shall not discharge settleable solids, sediments, sludge deposits, or suspended particles that may coat or cover submerged surfaces.*

3. *The permittee shall not discharge any pollutants that may impart undesirable odors, tastes, or colors to the receiving water body or to the aquatic life found therein, may endanger public health, or may result in the dominance of nuisance species.*

3.7 MONITORING

Phase I permit monitoring requirements should address both NMC implementation and LTCP development activities. Under the NMC, the CSO Control Policy recommends monitoring to characterize CSO impacts and to determine the efficacy of CSO controls. The objectives of such monitoring include the following:

- To map the drainage area for the CSS
- To identify all CSO outfall locations and develop a record of overflow occurrences (i.e., total number, frequency, and duration)

- To compile existing information about the receiving water (e.g., existing uses and water quality criteria) and whether WQS are currently being attained in the water body

- To compile existing information on water quality impacts associated with CSOs (e.g., beach closing).

The information collected as part of this control should be used to establish baseline conditions both prior to and subsequent to implementation of the NMC. Exhibit 3-3, given previously, presents example permit language for the NMC monitoring requirement.

The second aspect of Phase I monitoring is CSS characterization as part of LTCP development. The objectives of such monitoring include the following:

- To obtain a thorough understanding of the CSS, including its response to various precipitation events

- To evaluate the impacts of CSOs on the receiving water

- To assess the effectiveness of various CSO control alternatives in reducing the impacts of CSOs on the receiving water.

Exhibit 3-5, given previously, contains example permit language for the monitoring requirements associated with LTCP development. During LTCP development, the permittee should prepare a monitoring and modeling plan to be reviewed by the NPDES permitting authority and other members of the review team (see Section 3.10) before conducting monitoring and modeling activities. This review should ensure that adequate but not unnecessary information and data are collected to support LTCP development and the review and revision, if appropriate, of WQS to reflect site-specific wet weather conditions.

The permit writer and permittee should not view monitoring conducted as part of NMC implementation and LTCP development as independent activities, but rather as related components in the CSO control planning process. In many cases, the permittee will be conducting NMC implementation and LTCP development concurrently. Thus, where monitoring objectives overlap, the permit writer should coordinate the monitoring requirements into one

comprehensive permit condition. For example, the permit writer could put all monitoring requirements into one section of the permit.

In some cases, monitoring associated with the NMC and the LTCP might require special characterization studies (e.g., if existing site-specific information implies that CSOs are causing substantial water quality impacts). These studies might include the following:

- Sediment studies
- Whole effluent toxicity testing
- Biological assessment.

This type of monitoring can be required as a short-term study special condition. Typically, such a study is required in response to specific information indicating that the CSO is impairing the designated use or water quality. The permit writer might want to develop permit conditions that require 1) a separate monitoring plan to be developed for each special study, 2) the plan be submitted for review prior to performing the monitoring, and 3) the final report to be submitted to the NPDES permitting authority within a specified time after study completion.

The permit writer should review the monitoring plans carefully to ensure that the CSO information collected can be correlated with water quality impacts; otherwise, the studies might not provide conclusive evidence of the cause of impact. Other studies might be needed in conjunction with these special studies. For example, sediment studies might not be meaningful without a contaminant transport modeling study, and a bioassay might not provide meaningful results without toxicity data and CSO data. The permittee should include appropriate quality assurance/quality control procedures as part of these studies to ensure that the results can be verified. EPA's guidance on monitoring and modeling contains additional information on these types of studies (EPA, 1995d).

3.8 REPORTING

Reporting requirements related to CSO controls that should be included in the Phase I permit fall into two categories: 1) documentation of NMC implementation and 2) LTCP development. Exhibit 3-4, presented previously, provides example permit language, and Section 3.4.2 contains a detailed discussion of the recommended reporting requirements associated with the NMC. Section 3.5 discusses the recommended LTCP interim deliverables, as well as the requirement to submit the completed LTCP, and provides example permit language.

In addition to the CSO control-related reporting mentioned above, permittees should be required to periodically report the results from monitoring requirements established in the permit, including any special monitoring studies.

3.9 SPECIAL CONDITIONS

This section discusses two special conditions. The first, CSO-related bypass, should be used in certain limited circumstances to authorize bypasses under 40 CFR 122.41(m). The second special condition, a reopener clause, should appear in every permit covering CSOs.

3.9.1 CSO-Related Bypass

Some POTW treatment plants might have existing primary treatment capacity that significantly exceeds secondary treatment capacity. The CSO Control Policy recognizes that 40 CFR 122.41(m) can be interpreted to allow an advance authorization of a CSO-related bypass in the NPDES permit to take advantage of the opportunity to provide at least primary treatment of most or all wet weather flows. The CSO Control Policy envisions that the permittee would evaluate the feasibility of this as part of the LTCP; for this reason, this special condition is most likely to occur in the Phase II permit. If the permit writer believes that a CSO-related bypass might be an effective CSO control available for use in the Phase I permit, however, he or she should require the permittee to submit the necessary information as part of the permit application. Section 4.9.1 contains a detailed discussion of CSO-related bypass.

3.9.2 Permit Reopener Clause

As with any NPDES permit, the permit writer should include an appropriate reopener clause. Exhibit 3-9 provides an example reopener clause generally appropriate for a Phase I permit. This reopener language allows the permit to be modified or revoked and reissued to incorporate requirements to implement selected CSO controls in advance of the normal permit reissuance. This will assist the permit writer in accelerating the implementation of selected CSO controls. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. The permit writer might decide that the generic reopener clause already included in NPDES permits is sufficiently broad to address CSOs.

Exhibit 3-9. Example Permit Language for a Phase I Reopener Clause

This permit may be modified or revoked and reissued, as provided pursuant to 40 CFR 122.62 and 124.5, for the following reasons:

- To include new or revised conditions developed to comply with any State or Federal law or regulation that addresses CSOs that is adopted or promulgated subsequent to the effective date of this permit
- To include new or revised conditions if new information, not available at the time of permit issuance, indicates that CSO controls imposed under the permit have failed to ensure the attainment of State water quality standards
- To include new or revised conditions based on new information generated from the long-term control plan.

In addition, this permit may be modified or revoked and reissued for any reason specified in 40 CFR 122.62.

3.10 ADDITIONAL ACTIVITIES DURING PHASE I PERMITTING

The permit writer should be responsible for ensuring the receipt and coordinating the review of NMC documentation and all interim CSO-related documents submitted as part of the LTCP development. This will enable the permit writer to begin evaluating the permittee's progress in implementing the NMC and developing an LTCP. The early review during Phase I will assist the permit writer in identifying and resolving issues prior to the development of the Phase II permit. If the review of progress made by the permittee during the Phase I permit term is not performed until just prior to the development of the Phase II permit, significant delays

might occur, particularly if a permit writer detects extensive deficiencies in the progress made by the permittee.

To ensure that the NMC documentation and all LTCP deliverables are reviewed properly and to facilitate the expeditious review of these submissions, the permit writer should coordinate among appropriate representatives of the NPDES permitting authority, and should establish a review team made up of NPDES permitting and enforcement personnel, State WQS personnel, and State watershed personnel (see Section 4.5.1). The permit writer should identify team members and coordinate with them to review the NMC documentation and LTCP interim deliverables. The review team may also be useful in assisting the permit writer in developing permit conditions.

CHAPTER 4
PHASE II PERMITTING

This chapter provides the permit writer with guidance related to developing and issuing the Phase II permit. It also discusses the review and evaluation of documentation that should generally be required by the Phase I permit.

4.1 PHASE II PERMIT PROCESS

The primary objective of the Phase II permit should be to require the permittee to implement the selected combined sewer overflow (CSO) controls in the long-term control plan (LTCP) that will meet Clean Water Act (CWA) requirements. After the permittee has completed the development of the LTCP and has discussed and coordinated the selection of the necessary CSO controls with the permit writer, the State water quality standards (WQS) authority, and the public, the permit writer can embody the selected CSO controls into the Phase II permit.

To be consistent with the CSO Control Policy, the Phase II permit should generally contain provisions that:

- Require the permittee to continue implementing the nine minimum controls (NMC)
- Direct the permittee to implement and properly operate and maintain the selected CSO controls from the LTCP
- Require the permittee to implement a post-construction water quality monitoring program
- Require the permittee to periodically reassess overflows to sensitive areas where elimination or relocation was not feasible
- Authorize the National Pollutant Discharge Elimination (NPDES) permitting authority to reopen and modify or revoke and reissue the permit when the CSO controls do not result in attainment of WQS.

The permit writer should coordinate the development of the Phase II permit with the permittee and the State WQS authority to ensure that statutory and regulatory requirements are met. The permit writer should also ensure that the general public is involved in the decision-making process leading to finalization of the Phase II permit conditions through the public notice provisions of the NPDES permit regulations or the equivalent provision in approved NPDES State permit issuance programs.

In drafting the Phase II permit, the permit writer should work closely with the permittee and the State WQS authority in reviewing the CSO control alternatives presented in the LTCP. The permit writer should ensure that the permittee has shown, using either the presumption or demonstration approach, that the selected CSO controls will provide for the attainment of WQS in the receiving water body.

For the technology-based requirements in the Phase II permit, the permit writer should require continued implementation of the NMC as appropriate. The permittee's documentation may be used to show that the NMC continue to satisfy best available treatment economically achievable (BAT)/best conventional pollutant control technology (BCT) requirements on the basis of the permit writer's best professional judgment (BPJ). The permit writer may choose to modify any or all of the NMC from the Phase I permit to be more site-specific, based on the documentation submitted by the permittee. For the water quality-based requirements in the Phase II permit, the permit writer should require implementation of the CSO controls in the LTCP. The permit writer must document in the fact sheet or statement of basis how the Phase II permit meets the technology-based and water quality-based requirements of the CWA.

4.2 INFORMATION NEEDS

To develop a Phase II permit, the permit writer should rely on information and data that the permittee has submitted in response to Phase I permit requirements. This includes 1) the documentation showing the permittee's implementation of the NMC, 2) the LTCP, including any interim deliverables submitted during the LTCP development, and 3) any other information required by the Phase I permit. In most cases, the permit writer will need this information, at

a minimum, to develop an effective Phase II permit. If this information is not adequate, the permit writer should request additional information from the permittee. Section 3.2 describes available mechanisms for obtaining additional information and data.

4.3 IDENTIFICATION OF CSO OUTFALLS IN THE PERMIT

The locations of all CSO outfalls should have been documented prior to issuance of the Phase II permit. Therefore, the permit writer should specifically identify CSO outfalls in the Phase II permit. Exhibit 4-1 provides example permit language for authorization to discharge from CSO outfalls. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee.

Exhibit 4-1. Example Permit Language for Identifying CSO Outfalls in a Phase II Permit

The permittee is authorized to discharge from the outfalls listed below in accordance with the requirements of **[insert appropriate permit sections containing CSO requirements]** and other pertinent provisions of this permit.

Overflow Number	Overflow Outfall Location	Receiving Water Body
[insert number]	**[insert latitude/longitude (street address optional)]**	**[insert receiving water body]**

4.4 NINE MINIMUM CONTROLS

The permit writer should determine whether the permittee's actions to implement the NMC under the Phase I permit are adequate to meet the technology-based requirements of the CWA. This can be accomplished by reviewing the information provided by the permittee during the Phase I permit term (i.e., NMC documentation and the LTCP). Section 4.4.1 discusses recommended evaluation criteria. The Phase II permit should, as appropriate, require continued implementation of the NMC. When preparing the Phase II permit, therefore, the permit writer should develop permit language requiring the continued implementation of the NMC (including site-specific language, as appropriate) and its associated documentation. Section 4.4.2 provides example site-specific permit language.

4.4.1 Review of Permittee's Implementation of the Nine Minimum Controls

As discussed in Section 3.10, the permit writer, in conjunction with other appropriate personnel, should review the NMC documentation for completeness and compliance with Phase I permit requirements. The documentation serves as the basis for the development of technology-based requirements in the Phase II permit, on a BPJ basis reflecting site-specific considerations. If a permit writer determines that certain components are incomplete or not properly addressed by the permittee, then the permit writer should follow up with the permittee in one of two ways. If the permit writer believes that missing or incomplete components are relatively significant and that the permittee has not acted in good faith to submit the documentation, then the permit writer may coordinate with enforcement personnel to initiate an enforcement action for noncompliance with a Phase I permit condition. If only minor components are unclear or incomplete, the permit writer may simply request the missing or incomplete data from the permittee in accordance with the policies and procedures of the NPDES permitting authority (e.g., informal telephone request or formal request letter).

After receiving the completed documentation, the permit writer should evaluate whether the actions already taken or being taken by the permittee are adequate to meet the NMC requirements in the permit. This section recommends some general criteria under which the permit writer can evaluate the adequacy of the permittee's NMC. Because of the site-specific nature of the control measures, these criteria are not all-inclusive but provide a basis for evaluation by the permit writer. EPA's *Combined Sewer Overflows—Guidance for Nine Minimum Controls* contains additional detail on the NMC (EPA, 1995b).

The permit writer should review the NMC documentation using the criteria recommended in the following paragraphs (also provided in checklist form in Appendix C). The permit writer should note that not all the criteria will apply to each permittee. Applicable criteria are based on the control measures implemented by the permittee.

4.4.1.1 Proper Operation and Regular Maintenance Programs for the CSS and CSO Outfalls

When evaluating the permittee's operation and maintenance (O&M) program, the permit writer should consider whether the program:

- Describes the system, including an inventory of all CSO structures, equipment, and treatment facilities. Provides procedures for keeping this inventory current.
- Includes routine inspection, cleaning and maintenance, and repair schedules for all inventoried CSO outfalls, interceptors, regulators, pumping stations, and equipment. Includes schedules and inspection frequencies that are appropriate for the system.
- Includes inspections for dry weather overflows and illicit connections.
- Provides operating procedures and specifications for all equipment, structures, facilities, CSO outfalls, and off-line storage structures. Describes the hydraulic capacities of the collection and treatment systems, the storage capacities of the collection and treatment systems, and off-line storage capacity.
- Has in place operating procedures that reflect the best use of the system's flow and routing controls to minimize CSOs. Includes procedures to identify and correct combined sewer system (CSS) and CSO problems.
- Requires logs or other documentation of completed activities and documentation of sewage blockages.
- Addresses the location of overflows where O&M is hindered (e.g., structures are under major thoroughfares, railroad yards, or other difficult-to-reach or safety hazard areas).
- Allocates resources for O&M program implementation, including staffing level and funding, equipment, and training.
- Will be effective in reducing the number, frequency, and pollutant loadings of CSOs.

Note that an operational plan is also a component of the LTCP. The O&M program developed as part of NMC implementation essentially becomes the operational plan (i.e., the revised O&M program that includes the permittee's selected CSO controls). Thus, the operational plan can be reviewed using the above listed factors.

4.4.1.2 Maximum Use of the Collection System for Storage

The permit writer should consider whether the permittee has:

- Identified portions of the CSS usable for storage and determined the CSS storage capacity, including configuration, size, and pump station capacity
- Identified appropriate minor modifications to increase storage (e.g., raising existing weirs)
- Identified potential off-line storage at existing facilities
- Implemented procedures for maximizing CSS storage capacity.

The permit writer should note that this control measure might increase the possibility of "upstream" problems, such as basement flooding, and that the potential for a permittee to increase collection system storage varies. Increased sedimentation in the collection system, more frequent cleaning, odor potential, and other factors should be considered when evaluating the potential for collection system storage.

4.4.1.3 Review and Modification of Pretreatment Programs

This control applies primarily to permittees with approved pretreatment programs. If the permittee does not have an approved pretreatment program, however, it should nevertheless attempt to determine whether nondomestic sources are contributing to CSO impacts. In evaluating the implementation of this control, the permit writer should consider whether the permittee has:

- Determined whether the CSS receives nondomestic wastewater discharges.
- Prepared an inventory of nondomestic users who discharge to the CSS. Evaluated the discharge constituents and suspected impacts from such users.

- Evaluated the potential for regulating either the volume or pollutant loadings from nondomestic users to the CSS during wet weather flow conditions. The evaluation should include a discussion of whether the modifications are feasible or of practical value for CSO control. For example, the permit writer might evaluate whether the permittee has considered requiring nondomestic users with appropriate storage capacity to temporarily hold wastewater during precipitation events or when notified by the permittee or has considered prohibiting new users from discharging storm water or uncontaminated water, such as non-contact cooling water, to the collection system.

- Modified the pretreatment program if appropriate.

4.4.1.4 Maximization of Flow to Publicly Owned Treatment Works Treatment Plant

The permit writer should consider whether the permittee has:

- Compared existing flow conditions to the design capacity of the collection system

- Identified actions that could be taken to increase flows to the publicly owned treatment works (POTW) treatment plant during wet weather flow conditions without significantly affecting treatment performance

- Conducted tests to determine the plant capability to treat higher flows during wet weather flow conditions or determined, using available historical data, the maximum flow that can be treated

- Developed, implemented, and documented implementation of a flow maximization plan during wet weather flow conditions.

4.4.1.5 Prohibition of CSOs During Dry Weather Flow Conditions

The permit writer should consider whether the permittee has:

- Developed adequate procedures to document where and when dry weather overflows occur, including follow-up inspections after dry weather overflows occur

- Developed and instituted procedures to prevent and eliminate dry weather overflows, including routine inspection of regulators and CSO outfalls, as part of the O&M plan.

4.4.1.6 Control of Solid and Floatable Materials in CSOs

The permit writer should consider whether the permittee has:

- Evaluated the following technologies for the control of solid and floatable materials in CSOs: screening materials using baffles, screens, and netting; skimmer boats; skimming from water body surface with booms at outfalls in confined areas; and source control, which may be addressed under the pollution prevention program for CSO outfalls (see Section 4.4.1.7—Pollution Prevention Program)
- Identified and addressed problems that might be created by the installation of the control technology
- Implemented the appropriate control technology, considered and provided justification that the technology is appropriate for the site conditions, and is conducting associated inspections and regular maintenance.

4.4.1.7 Pollution Prevention Program

The permit writer should consider whether the permittee has:

- Evaluated source control measures both at the government level (e.g., street cleaning; banning or substitution of products, such as plastic food containers; controlled use of pesticides, fertilizers, and other hazardous substances at public facilities) and among the public (e.g., used oil recycling, household hazardous waste collection)
- Included a wide-reaching public education program
- Evaluated mechanisms to encourage water conservation (e.g., public outreach, structuring of water/sewer service charges, local ordinance provisions)
- Allocated adequate resources to conduct pollution prevention program activities
- Implemented and maintained detailed records of pollution prevention activities
- Promoted the use of industrial/construction best management practices (BMPs) for storm water.

4.4.1.8 Public Notification

The permit writer should consider whether the permittee has:

- Evaluated options to ensure that the public receives adequate notification of CSO occurrences and CSO impacts
- Implemented notification procedures regarding the presence of contaminants at critical levels in the receiving water bodies due to CSOs
- Implemented procedures that notify persons reasonably expected to be affected by the CSO
- Documented CSO occurrences and associated notifications
- Installed identification signs at each CSO outfall.

4.4.1.9 Monitoring to Effectively Characterize CSO Impacts and Efficacy of CSO Controls

The permittee is likely to have conducted monitoring recommended for this minimum control in conjunction with CSS characterization associated with the LTCP development. Thus, the permit writer should review the permittee's monitoring efforts as a whole and assemble all applicable monitoring data prior to the evaluation. In evaluating the permittee's monitoring data, the permit writer should consider whether the permittee has:

- Characterized the CSS to identify all CSO locations and receiving water bodies
- Collected data on the total number of overflow events and the frequency and duration of CSOs for a representative number of CSO events
- Collected water quality data and information on chemical, physical, and biological impacts resulting from CSOs (e.g., beach closings, floatables, wash-up episodes, fish kills, impaired habitat for aquatic life)
- Conducted monitoring to determine baseline conditions prior to implementation of the NMC
- Conducted monitoring to determine baseline conditions subsequent to implementation of the NMC, which may be used in LTCP development.

It is important to note that the permittee should be considering its NMC measures collectively using a holistic approach—that is, it may be possible to satisfy two or more of the NMC through a single control measure.

4.4.2 Permit Conditions

Once the permit writer has evaluated the permittee's NMC implementation and documentation efforts, he or she should, where appropriate, develop Phase II permit language that requires the continued implementation of the NMC. The permit language should be tailored to the permittee's specific circumstances and should incorporate site-specific implementation and recordkeeping requirements. The permit writer might need to coordinate the development of this permit language with the LTCP implementation language because it is possible that some of the NMC control measures will be incorporated into the LTCP as selected CSO controls or that some NMC control measures might no longer apply when the selected CSO controls have been implemented (e.g., if the system is being separated).

The permit writer should establish technology-based requirements in the Phase II permit based on the permittee's documentation of the NMC and any revisions resulting from development of the LTCP. Exhibit 4-2 provides example permit language for each of the NMC. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. A portion of this language should be applicable to all permittees implementing each particular minimum control. Additional site-specific language, which should be tailored to the specific control measures implemented by the permittee, is given in italics. Although the site-specific language might not be appropriate for all permittees, it is provided as an example of the type of language and detail appropriate for requiring implementation of the NMC in the Phase II permit. The permit writer may be able to select language directly from the permittee's NMC documentation or LTCP and incorporate it into the permit. Although this guidance presents numerous examples of site-specific permit conditions, it may be appropriate in some cases to write broader conditions. This would provide sufficient flexibility to allow the permittee to identify and implement other controls that are equally or more protective without the need to modify the permit.

Exhibit 4-2. Example Permit Language for Continued Implementation of the Nine Minimum Controls

I. Effluent Limits

A. Technology-based requirements for CSOs. The permittee shall comply with the following technology-based requirements:

1. Conduct proper operations and regular maintenance programs. The permittee shall implement the operation and maintenance plan for the CSS that will include the elements listed below. The permittee also shall update the plan to incorporate any changes to the system and shall operate and maintain the system according to the plan. The permittee shall keep records to document the implementation of the plan.

Site-Specific Language:

Designation of a Manager for Combined Sewer System. The permittee shall designate a person to be responsible for the wastewater collection system and serve as the contact person regarding the CSS.

Inspection and Maintenance of CSS. The permittee shall inspect and maintain all CSO structures, regulators, pumping stations, and tidegates to ensure that they are in good working condition and adjusted to minimize CSOs and prevent tidal inflow. The permittee shall inspect, or cause to be inspected, each CSO outfall at an appropriate frequency to ensure no dry weather overflows are occurring. The inspection shall include, but is not limited to, entering the regulator structure if accessible, determining the extent of debris and grit buildup, and removing any debris that may constrict flow, cause blockage, or result in a dry weather overflow. The permittee shall record in a maintenance log book the results of the inspections. For CSO outfalls that are inaccessible, the permittee may perform a visual check of the overflow pipe to determine whether or not the CSO is occurring during dry weather flow conditions.

Provision for Trained Staff. The permittee shall ensure the availability of trained staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. Each staff member shall receive appropriate training.

Allocation of Funds for O&M. The permittee shall allocate adequate funds specifically for operation and maintenance activities. The permittee shall submit a certification of assurance from the appropriate local government entities that the necessary funds, equipment, and personnel have been or will be committed to carry out the O&M plan.

2. Maximize use of the collection system for storage. The permittee shall maximize the in-line storage capacity. The permittee shall keep records to document implementation.

Site-Specific Language:

The permittee shall 1) maintain all dams or diversion structures at their current heights (as of the date of permit issuance) or greater, 2) minimize discharges from the CSO outfall locations designated as [insert appropriate designation] until the specified capacity of the [named] Combined Sewer Retention Basin is used to store the overflow for later treatment at the plant, and 3) keep records of the flow entering and leaving the [named] Combined Sewer Retention Basin.

Exhibit 4-2. Example Permit Language for Continued Implementation of the Nine Minimum Controls (continued)

3. Review and modify pretreatment program. The permittee shall continue to implement selected CSO controls to minimize the impact of nondomestic discharges on CSOs. The permittee shall re-evaluate at an appropriate frequency whether additional modifications to its pretreatment program are feasible or of practical value. The permittee shall keep records to document this evaluation and implementation of the selected CSO controls to minimize CSO impacts resulting from nondomestic discharges.

   Site-Specific Language:

   The permittee shall require significant industrial users (SIUs) discharging to the CSS to minimize batch discharges during wet weather conditions.

   [Alternative language for a permittee without an approved pretreatment program:] Actions to minimize impact of nondomestic discharges on CSOs. The permittee shall continue to implement selected CSO controls to minimize CSO impacts resulting from nondomestic discharges.

4. Maximize flow to POTW treatment plant. The permittee shall operate the POTW treatment plant at maximum treatable flow during wet weather flow conditions/events and deliver all flows to the treatment plant within the constraints of the capacity of the treatment plant. The permittee shall keep records to document these actions.

5. Prohibit combined sewer overflows during dry weather. Dry weather overflows from CSO outfalls are prohibited. All dry weather overflows must be reported to the permitting authority within **[insert appropriate number of days]** days of when the permittee becomes aware of a dry weather overflow. When the permittee detects a dry weather overflow, the permittee shall begin corrective action immediately. The permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated. The permittee shall record in the inspection log book dry weather overflows, as well as the cause, corrective measures taken, and the dates of beginning and cessation of overflow.

6. Control solid and floatable materials in CSOs. The permittee shall implement measures to control solid and floatable materials in CSOs.

   Site-Specific Language:

   These control measures shall include:

   - *Measures to ensure that baffles are in place to control overflows from the diversion structures or that other means are used to reduce the volume of floatables.*
   - *Inspection and maintenance of the sewer system so that solid or floatable materials greater than [insert size] are not present in CSOs.*

Exhibit 4-2. Example Permit Language for Continued Implementation of the Nine Minimum Controls (continued)

7. Develop and implement pollution prevention program. The permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters. The permittee shall keep records to document pollution prevention implementation activities.

   Site-Specific Language:

   This program shall include:

   - *Street sweeping and catch basin modification or cleaning at an appropriate frequency to prevent large accumulations of pollutants and debris*
   - *A public education program that informs the public of the permittee's local laws that prohibit littering and the use of phosphate-containing detergents and pesticides.*
   - *An oil recycling program.*

8. Notify the public of CSOs. The permittee shall continue to implement a public notification plan to inform citizens of when and where CSOs occur. The process must include:

   a. A mechanism to alert persons using all receiving water bodies affected by CSOs

   b. A system to determine the nature and duration of conditions that are potentially harmful to users of these receiving water bodies due to CSOs.

   The permittee shall keep records documenting public notification.

   Site-Specific Language:

   Within 3 months of the effective date of this permit, the permittee shall install and maintain identification signs at all CSO outfalls owned and operated by the permittee. The permittee must place the signs at or near the CSO outfalls and ensure that the signs are easily readable by the public.

9. Monitor to effectively characterize CSO impacts and the efficacy of CSO controls. The permittee shall regularly monitor CSO outfalls to effectively characterize CSO impacts and the efficacy of CSO controls.

   Site-Specific Language:

   [For example language, see Exhibit 4-5.]

Exhibit 4-2 does not provide site-specific permit language for the ninth minimum control: monitoring to effectively characterize CSO impacts and efficacy of CSO controls. This monitoring should be integrated with the monitoring requirement to be placed in the Phase II permit associated with implementation of the LTCP. Section 4.7 contains information on developing permit language for these monitoring requirements.

4.4.2.1 Documentation for Fact Sheet/Statement of Basis

As required in 40 CFR 124.7 and 124.8, a fact sheet (or a statement of basis for minor discharges) must be prepared for every NPDES permit. The purpose of the fact sheet is to set forth the principal technical facts and the significant factual, legal, methodological, and policy questions considered in preparing an NPDES permit. Although 40 CFR 124.8 establishes the minimum requirements for a fact sheet, each permit writer should follow the format used by the NPDES permitting authority.

The fact sheet must discuss the basis of all Phase II permit conditions requiring implementation of the NMC. The permit writer should use the permittee's NMC documentation to record in the fact sheet the justification for implementation of the specific minimum controls chosen by the permittee. Further, when NMC are imposed in a specific permit, the permit writer should discuss the fact that the NMC are being used to comply with the technology-based requirements of the CWA (see Section 3.6.1). EPA's *Training Manual for NPDES Permit Writers* contains more information on preparing a fact sheet or statement of basis (EPA, 1993).

4.5 LONG-TERM CONTROL PLAN

The permit writer will generally be responsible for reviewing interim deliverables (see Section 3.5.2) and for working closely with the permittee to ensure that any inadequacies, problems, or issues are addressed in a timely fashion prior to submission of the completed LTCP and the development and issuance of the Phase II permit.

In preparing for the development and issuance of a Phase II permit, the permit writer should review the LTCP submitted by the permittee. After reviewing the LTCP, the permit

writer should require, where appropriate, implementation of the selected CSO controls identified in the LTCP. The primary responsibility of the permit writer in developing Phase II permits is to ensure that the CSO controls proposed by the permittee comply with the requirements of the CWA, including attainment of WQS. The requirement to implement these controls should be appropriately reflected as enforceable NPDES permit conditions or included in another enforceable mechanism. This section provides guidance on how to review the LTCP and develop permit conditions to implement the LTCP.

4.5.1 Review of Long-Term Control Plan

The permit writer should form and coordinate a review team that will be responsible for reviewing the LTCP and ensuring that CWA requirements will be met. An appropriate review team should include:

- WQS personnel to assist in evaluating proposed CSO controls and to review and revise State WQS, as appropriate. WQS personnel can also assist in evaluating any ambient or special monitoring conditions (e.g., toxicity testing) that may be required during the term of the Phase II permit to monitor the effectiveness of the selected CSO controls.

- Enforcement personnel to assist in ensuring that permit language is enforceable. Enforcement personnel can also provide input on the use of other enforceable mechanisms (e.g., administrative orders) to require implementation of the selected CSO controls. This will be particularly important if extensive time is required by the permittee to comply with Phase II permit requirements.

- Field personnel to help review monitoring plans and assist in the development of CSO monitoring requirements.

- Watershed personnel to ensure that the permittee's CSO control efforts are coordinated with other point and nonpoint source control efforts within the watershed.

The review team should also include other types of personnel, as appropriate, depending on the site-specific situation.

As discussed in Section 3.5.2, the permittee is likely to have submitted parts of the LTCP as interim deliverables during the Phase I permit term. The permit writer and other members of the review team should review these deliverables, as well as the completed LTCP detailing the permittee's selected CSO controls, as soon as they are submitted.

Upon receipt of the LTCP, the permit writer should first determine whether it complies with the requirements in the Phase I permit. After initial review of the LTCP, if a permit writer determines that certain components are incomplete or are addressed improperly, the permit writer should follow up with the permittee. Section 4.4.1 presents information on followup procedures.

The permit writer, with support from other review team members, should review the LTCP to ensure consistency with the CSO Control Policy and to ensure that the selected CSO controls are reasonable and will result in compliance with CWA requirements. Of the various CSO control alternatives considered by the permittee during LTCP development, the LTCP will identify one or a combination of CSO controls for implementation. The LTCP should discuss all of the alternatives and, more importantly, why the selected CSO controls were chosen. There should also be a discussion related to the selected CSO controls, including maximization of treatment at the POTW treatment plant; the operational plan; integration of the NMC; monitoring; costs of the selected CSO controls and financing; and the implementation schedule, possibly including identification of milestones where re-evaluation and modifications would occur. All other parts of the LTCP, including the CSS and water quality characterization monitoring and modeling used during the development process, the other alternatives and costs, and public participation, ultimately become "historical" material that should not be addressed in the Phase II permit, because they are not part of the selected CSO controls. This information is generally critical for appropriate review of the LTCP, however.

The remainder of this section presents questions the permit writer should consider while reviewing the LTCP. These recommended evaluation criteria are also provided in a checklist in Appendix D. These review questions are based on the provisions of the CSO Control Policy

and the guidance provided in the *Combined Sewer Overflows—Guidance for Long-Term Control Plan* (EPA, 1995a). Although the permit writer may use these questions as the basis for review, he or she may need to supplement them to reflect the site-specific Phase I permit conditions established for a particular permittee. For example, if a Phase I permit specifically required monitoring and evaluation of certain pollutants of concern, then the permit writer should ensure that the permittee has addressed these pollutants in its monitoring plan.

In reviewing the LTCP, the permit writer should remember that the level of detail in the LTCP can vary significantly depending on the permittee and its CSS. The overall intent of the review is to ensure that the LTCP is a coherent, organized document and that the permit writer can follow a logical step-by-step analysis that justifies selection of the CSO controls.

4.5.1.1 Public Participation

When evaluating the public participation element of the LTCP, the permit writer and other review team members should consider the following evaluation questions to ensure that the proposed plan, once implemented, will result in an effective public participation program:

- Does the public participation process seek to actively involve rate payers, industrial users of the CSS, persons near the affected waters, and persons who use the affected waters?
- Does the public participation plan document how the public was notified of public participation events?
- Does the public participation plan include a record of the public participation events, including the number of people attending and a record or summary of comments?
- Does the public participation plan contain a summary of comments and the changes or decisions made in response to public comments?

4.5.1.2 CSS Characterization, Monitoring, and Modeling

When the permittee submits a proposed monitoring plan as an interim deliverable during LTCP development, the permit writer and other team members should review it to ensure that,

once implemented, the proposed plan describes an effective monitoring program that will provide the necessary data. The team should consider the following questions:

- Is there a general description of the CSS that includes the geographical area and population served?
- Is there a map of the CSS depicting the location of all CSO outfalls and receiving water bodies?
- Have sensitive areas and all outfalls located in these areas been identified?
- Is there a description of how the CSS responds hydraulically to rainfall events, and is it adequate to determine which rainfall events trigger CSOs?
- Is there information on the volume, flow rate, and frequency of CSOs and the pollutants discharged?
- Is there information on the CSO pollutant loadings and their impacts on receiving waters?
- Has all available information on pollutant loadings from other point and nonpoint sources in the watershed and their impacts on receiving waters been identified and compiled?
- Is there information on designated uses of receiving waters and whether the designated uses are being met?
- Does the CSS and CSO characterization provide information on the known effects of the CSOs on water quality during precipitation events, as well as provide the level of detail needed to model or project both the operation of the system and the impacts of various overflow scenarios on the receiving waters?
- Is monitoring sufficient to document baseline conditions to allow the permittee to demonstrate the long-term benefits of CSO controls?
- Has the monitoring been coordinated with any ongoing or planned State programs and programs of other permittees within the same watershed?
- If modeling was conducted, is the model identified and described, and are the results provided?

Appendix B contains additional information on reviewing monitoring plans.

4.5.1.3 CSO Control Alternatives

The permit writer and the rest of the review team should consider the following questions when reviewing the CSO control alternatives:

- Did the permittee develop a comprehensive list of CSO control alternatives? Did this list include alternatives from each of the four general categories—source controls, collection system controls, storage, and treatment technologies—described in guidance for LTCPs (EPA, 1995a)?
- Did the permittee describe each CSO control alternative considered?
- Does the plan describe the process by which the CSO control alternatives were developed?
- Does the plan compare the environmental benefits of the CSO control alternatives?
- Is cost/performance information (including curves) for each of the CSO control alternatives provided? Do the cost/performance analyses evaluate a range of levels of controls that were developed based on the permittee's site-specific conditions (e.g., zero overflow events per year, and averages of 1 to 3, 4 to 7, and 8 to 12 overflow events per year)?
- Does the LTCP describe the approach used to screen the list of CSO control alternatives, including the recommended screening criteria? Do the screening criteria include performance factors, implementation and operation factors, such as costs, and environmental impacts (described in EPA's guidance for LTCPs [EPA, 1995a])?

4.5.1.4 Selected CSO Controls

When evaluating the CSO controls, the permit writer should consider the following questions:

- Is the presumption or demonstration approach used?
- Does the plan identify the reasons for selecting certain CSO controls and not others? Were reasons for rejecting specific CSO control alternatives appropriate?
- Have the NMC been integrated into the permittee's description of its selected CSO controls?

- Will the selected CSO controls eliminate all CSOs to sensitive areas? If not, do the data support the permittee's conclusion that elimination is not physically possible or economically achievable?

- If CSOs to sensitive areas remain:

  - Will these CSOs receive treatment?
  - Will the CSO controls be sufficient to provide for the attainment of WQS?

- Have control efforts for other point and nonpoint sources of pollutants within the watershed been considered?

- Will the CSO controls provide treatment or removal of floatables and settleable solids equivalent to that achieved by primary clarification? Is the mechanism for solids and floatables disposal described?

- Will the disinfection of effluent be necessary in order to attain WQS? If so, is disinfection proposed as part of the CSO controls, and will removal of harmful disinfection chemical residuals be necessary?

- Do the selected CSO controls provide the maximum pollution reduction benefits reasonably attainable?

- Will the selected CSO controls provide for the attainment of WQS? If WQS cannot be met because of sources other than CSOs, has the permittee provided information on the other sources and natural background conditions?

- Has a total maximum daily load (TMDL) been developed for the watershed? If so, has the permittee considered the TMDL in developing its LTCP?

- Are the selected CSO controls designed to allow cost-effective expansion or cost-effective retrofitting if additional controls are determined necessary to provide for the attainment of WQS?

4.5.1.5 Implementation Schedule

In reviewing the implementation schedule, the permit writer should use the data and information supporting the prioritization of the CSO projects on the basis of their environmental impacts, as well as the analysis of financial status. EPA's *Combined Sewer Overflows—Guidance for Long-Term Control Plan* (EPA, 1995a) and *Combined Sewer Overflows—Guidance for Financial Capability Assessment* (EPA, 1995e) recommend criteria to evaluate the reasonableness of construction schedules and financing plans in the LTCP. After reviewing

these documents, the permit writer should refer to the following questions when reviewing the implementation schedule:

- Do any phased construction schedules consider:
  - Elimination of CSOs to sensitive areas
  - Use impairment?
- Do any phased construction schedules include an analysis of financial capability, such as the following factors:
  - Median household income
  - Total annual wastewater and CSO control costs per household as a percent of median household income
  - Overall net debt as a percent of full market property value
  - Property tax revenues as a percent of full market property value
  - Property tax collection rate
  - Unemployment
  - Bond rating?
- Did the permittee evaluate the following factors:
  - Grant and loan availability
  - Previous and current residential, commercial, and industrial sewer user fees and rate structures
  - Other viable funding mechanisms and sources of financing?
- Does the schedule include milestones for all major implementation activities, including environmental reviews, siting of facilities, site acquisition, and Army Corps of Engineers permitting?

The permit writer should review the financing plan to determine whether it provides the funds necessary to construct CSO controls and assess whether water quality considerations merit revisions to the proposed implementation schedule. If so, the permit writer may consider a revised schedule.

4.5.1.6 Operational Plan

In evaluating the operational plan, the permit writer should consider whether the permittee's O&M program addresses the evaluation criteria proposed in Section 4.4.1 for the

NMC. However, the permit writer should ensure the operational plan includes newly-selected CSO control structures.

4.5.1.7 . Post-Construction Compliance Monitoring

The permit writer should review the monitoring plan with members of the review team who are knowledgeable about design and implementation of monitoring programs. When evaluating post-construction compliance monitoring, the permit writer should consider the following questions:

- Does the monitoring program include monitoring of CSOs that are representative of the impacts to receiving waters?
- Does the monitoring program include ambient receiving water body monitoring at representative CSOs, as well as monitoring prior to CSO impacts? Has the monitoring program for the receiving water body been coordinated with any ongoing or planned State programs and programs of other permittees within the same watershed?
- Does the monitoring program include any biological parameters (e.g., fish, zooplankton)?
- Does the monitoring program address pollutants included in the water quality criteria for the specific designated use(s) of the receiving water, pollutants key to the attainment of the designated use(s), and pollutants affected by the CSO controls?
- Does the monitoring program include appropriate measures of success?

Appendix B contains additional information on the review of a monitoring plan.

4.5.2 Implementation of the Long-Term Control Plan

As described in the CSO Control Policy, Phase II permits should contain "narrative requirements which ensure that the selected CSO controls are implemented, operated and maintained as described in the long-term CSO control plan." Because the CSO controls will have been selected on a site-specific basis, the implementation conditions should also be site-specific. Thus, the permit writer should not simply develop a generic permit condition that

requires implementation of the LTCP as developed, incorporating the LTCP into the NPDES permit by reference. Rather, the permit should contain specific conditions that require implementation of the selected CSO controls, the proposed O&M program requirements, and the proposed post-construction compliance monitoring program. The following subsections briefly discuss each of these portions of the LTCP.

4.5.2.1 Selected CSO Controls

The permit writer should develop permit conditions that specifically require the implementation of the selected CSO controls, once approved. As discussed above, due to the differences among CSSs, the CSO controls identified in LTCPs will vary from system to system. In many cases, the CSO controls will require major construction and implementation activities that can only be completed over several five-year NPDES permit cycles. The CSO Control Policy recommends that the LTCP include the information necessary to develop the fixed-date schedules for funding and implementing the CSO control program. The LTCP should prioritize the individual projects within the overall control program on the basis of environmental impacts, financial capability, and available funding. Section 3.5.1 provides additional discussions on the permittee's development of implementation schedules.

When the implementation schedules for the selected CSO controls are established, the permit writer should determine the appropriate mechanism for imposing the schedule on the permittee. As in the Phase I permit, the permit writer should require in the Phase II permit that the permittee meet applicable WQS. If implementing regulations explicitly authorize a compliance schedule, the permit writer may incorporate such a compliance schedule for the attainment of water quality-based effluent limitations into the Phase II permit. In all other cases, the Phase II permit must require immediate compliance with its technology- and water quality-based requirements. When the permittee is unable to comply immediately with these requirements (as will frequently be the case), the permit writer should include a fixed-date implementation schedule in an enforceable mechanism issued simultaneously with the Phase II permit. Appropriate enforceable mechanisms may include administrative or judicial orders. The

permit writer should discuss with the appropriate enforcement authority the choice of the mechanism to use in each situation.

Exhibit 4-3 provides example language requiring compliance with an LTCP implementation schedule for the selected CSO controls. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. (The example provided assumes that the permittee has successfully implemented the NMC, and that the schedule is only to implement the CSO controls identified in the LTCP.) In this permit requirement, the permit writer should list specific activities necessary to implement selected controls. For example, if one of the selected CSO controls is construction of a retention basin, the permit writer should include specific language for the various activities necessary to complete the construction, as shown in the italicized site-specific language in Exhibit 4-3. These activities and the corresponding completion dates should be taken directly from the LTCP whenever possible. In many instances, the LTCP might contain a combination of selected CSO controls, such as construction of additional retention basins, separation of portions of the CSS, and maximization of flow receiving primary treatment at the POTW treatment plant. In these cases, the permit writer should include activities with corresponding completion dates for implementing each of the selected CSO controls. In addition to identifying compliance dates within the implementation schedule, the permit writer should also require progress reports to demonstrate compliance with the various compliance dates. Section 4.8 provides additional guidance on appropriate reporting requirements for the Phase II permit.

4.5.2.2 Operational Plan

As described in Section 4.4.2, the permittee should have developed an O&M program as part of the NMC. Once the permittee has selected CSO controls in its LTCP, the permittee should revise the O&M plan developed and implemented as part of the NMC to include the selected CSO controls. Example permit requirements for implementing the O&M program are contained in Exhibit 4-2, given previously.

Exhibit 4-3. Example Permit Language for Implementing Selected CSO Controls

II. Long-Term Control Plan

The permittee shall implement and effectively operate and maintain the CSO controls identified in the long-term control plan. The implementation schedule for these controls shall be as follows:

Activity	Completion Date
[insert name of activity]	**[insert date]**

Site-Specific Language:

1. *Retention basin*
   - *Complete design of **[named]** retention basin.* ***[insert date]***
   - *Submit construction drawings for **[named]** retention basin.* ***[insert date]***
   - *Initiate construction of **[named]** retention basin.* ***[insert date]***
   - *Complete construction of **[named]** retention basin.* ***[insert date]***
2. ***[Named street]** sewer separation*
   - *Complete design.* ***[insert date]***
   - *Solicit bids.* ***[insert date]***
   - *Award contracts.* ***[insert date]***

NOTE: A compliance schedule exceeding the term of the permit may only be included in the permit if explicitly authorized in the applicable State WQS.

4.5.2.3 Post-Construction Compliance Monitoring

Implementation of the post-construction compliance monitoring program proposed by the permittee as part of its LTCP generally is important for determining the overall effectiveness of the selected CSO control(s) in achieving compliance with the CWA. It might not be appropriate to require the implementation of a post-construction monitoring program until construction is well underway or completed. Section 4.7 presents further guidance on Phase II permit monitoring requirements.

4.5.2.4 Documentation for Fact Sheet/Statement of Basis

As discussed previously, the permit writer must prepare a fact sheet or statement of basis that describes the basis for all NPDES permit conditions. For Phase II permits that require the implementation of CSO controls selected in an LTCP, the permit writer should use the information from the LTCP to record in the fact sheet or statement of basis the justification for implementation of the specific CSO controls chosen by the permittee. In cases where the permit

writer has determined that the permittee's proposed control levels and selected CSO controls are not adequate to provide for the attainment of WQS, the permit writer should document the basis for such determination (i.e., explain why the CSO controls selected by the permittee are not adequate).

4.6 EFFLUENT LIMITATIONS

As with the Phase I permit and consistent with 40 CFR 122.44 (NPDES requirements), both technology- and water quality-based effluent limitations are included in the Phase II permit. However, these two permit phases differ with respect to the type of effluent limitation each permit phase should require. The CSO Control Policy provides that in Phase I, the permit writer should establish narrative water quality-based effluent limitations; by comparison, the CSO Control Policy recommends that Phase II water quality-based effluent limitations be expressed as numeric performance standards (e.g., number of overflow events per year) for the selected CSO controls. When sufficient CSO-related information and data are available for the permit writer to develop numeric water quality-based effluent limitations, the permit writer should do so. This information, however, is not likely to be available for inclusion in the Phase II permit.

4.6.1 Technology-Based Requirements

Phase II permits should require CSO permittees to continue implementation of technology-based controls. These technology-based controls generally include the NMC on a BPJ basis and may also include components of any additional technology-based controls selected in the LTCP. The permit writer should re-evaluate and incorporate appropriate NMC requirements in the Phase II permit, as discussed in Section 4.4. The discussion of the technology-based requirements presented in Section 3.6.1 is also applicable to Phase II permits.

4.6.2 Water Quality-Based Requirements

In developing water quality-based requirements for CSOs, the permit writer should have a thorough understanding of the applicable State WQS and any specific guidance related to wet

weather conditions. This information, in addition to the LTCP information, will provide the basis for the permit writer to develop the appropriate water quality-based requirements in the Phase II permit.

As described in Section IV.B.2 of the CSO Control Policy, Phase II permits should contain "Water quality-based effluent limits under 40 CFR 122.44(d)(1) and 122.44(k), requiring, at a minimum, compliance with, no later than the date allowed under the State's WQS, the numeric performance standards for the selected CSO controls...." The CSO Control Policy assumes that adequate data will generally not be available at the beginning of the Phase II permitting process for the permit writer to fully and accurately assess the need for numeric water quality-based effluent limits. Consequently, the CSO Control Policy depends on compliance with the performance standards of the selected CSO controls to achieve water quality goals.

The performance standards to be applied to a permittee will depend on the selected CSO control approach. The CSO Control Policy specifies the performance standards for the presumption approach. To satisfy the demonstration approach, the permit writer should establish performance standards for the selected CSO controls that will provide for the attainment of WQS. The following subsections discuss the water quality-related considerations for each approach.

In addition to performance standards designed to meet WQS, the permit writer should include narrative permit language providing for the attainment of applicable WQS. In certain circumstances, sufficient data may exist (e.g., the permittee may have substantially completed construction of selected CSO controls) for the permit writer to develop numeric water quality-based effluent limits. EPA's *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) might provide useful insights on determining appropriate water quality-based effluent limitations. Although this EPA manual is intended to address **continuous** discharges, it may provide useful information for wet weather flows.

4.6.2.1 Presumption Approach

Where a permittee chooses (and the NPDES permitting authority authorizes) the presumption approach, he or she will likely be required to meet numeric performance standards (e.g., a certain number of overflow events per year). These criteria were established in the CSO Control Policy because "data and modeling of wet weather events often do not give a clear picture of the level of CSO controls necessary to protect WQS." The CSO Control Policy presumes, therefore, that compliance with these numeric performance standards generally will be sufficient to meet WQS. The permit writer will be responsible, however, for ensuring that this presumption is reasonable for the CSOs to be permitted. To determine whether the presumption approach is reasonable, the permit writer should review the data generated and analysis conducted to characterize, monitor, and model the CSS and to review the consideration of sensitive areas by the permittee.

Exhibit 4-4 provides example permit language for a permittee that uses the presumption approach. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. (The example permit language addressing disinfection requirements specifically requires reduction of a pathogen indicator (e.g., *E. coli*) to levels that will provide for attainment of WQS. This example language assumes that such a standard exists. In addition, the example permit language assumes that the control of harmful disinfection products (e.g., chlorine) might be necessary. In both cases, the permit writer should customize the disinfection requirements to those required to meet State WQS.)

The permit writer will be responsible for eventually reviewing the permittee's evaluation of CSO controls and determining whether water quality will be adequately protected. It is likely that an adequate demonstration and review for attainment of WQS will not be possible until the permittee has implemented its selected CSO controls. Therefore, the permit writer might not complete an evaluation, including consideration of the development of numeric water quality-based effluent limitations, until the post-Phase II CSO permitting. In any case, use of the presumption approach does not shield a permittee from the possibility that additional controls might eventually be necessary in order to attain water quality objectives.

Exhibit 4-4. Example Permit Language for Performance Standards for the Presumption Approach

I. Effluent Limits

B. Water quality-based requirements for CSOs

The permittee shall not discharge any pollutant at a level that causes or contributes to an in-stream excursion above numeric or narrative criteria adopted as part of **[insert State name]** water quality standards.

The permittee shall comply with the following performance standards. These standards shall apply during **[insert average design conditions upon which controls are based]**.

1. **[The permit writer should select the appropriate standard below.]**

   The permittee shall discharge no more than an average of **[insert appropriate number: 4, 5, or 6]** overflow events per year not receiving the treatment specified below.

   [or]

   The permittee shall eliminate or capture for treatment, or storage and subsequent treatment, at least 85 percent of the system-wide combined sewage volume collected in the combined sewer system during precipitation events under design conditions. Captured combined sewage shall receive the treatment specified below.

   [or]

   The permittee shall eliminate or remove the following mass of pollutants from the combined sewage volume collected in the combined sewer system during precipitation events under design conditions:

   [insert x] pounds of **[insert pollutant]**
   [insert y] pounds of **[insert pollutant]**

[Insert the following language only if the first or second alternative is chosen above.]

Any combined sewage captured shall receive a minimum of the following treatment:

- Primary clarification or equivalent.
- Solids and floatables disposal.
  [Insert appropriate disinfection requirements as necessary to meet State WQS.]
- Disinfection. Fecal coliform counts shall be maintained below **[insert applicable level]**.
  [Insert appropriate dechlorination requirements if applicable based on State WQS.]

4.6.2.2 Demonstration Approach

Under the demonstration approach, the permittee should be required to show that the selected CSO controls will not cause or contribute to the exceedance of WQS. In a receiving water with pollution sources other than the permittee's CSOs, this may be accomplished through the watershed approach. The permit writer will be responsible for ensuring that the permittee demonstrates that the selected CSO controls are adequate to provide for the attainment of WQS. The specific performance standards that should be included in a permit will depend on the CSO

controls selected. This manual does not provide example permit language for the demonstration approach because such language will be site-specific and based on the permittee's demonstration. However, the permit writer should attempt to draft permit language in terms of performance standards or other clear specific standards similar in type to the examples provided in Exhibit 4-4 for the presumption approach. Not all selected CSO controls (e.g., extensive use of BMPs) lend themselves to specific numeric performance standards. However, the permit writer should still attempt to develop permit conditions that will hold the permittee accountable for implementing CSO controls as planned (e.g., specifying implementation and scheduled evaluation of BMPs).

4.7 MONITORING

Monitoring is generally necessary to 1) evaluate the water quality impacts from CSOs on receiving waters and the effectiveness of CSO controls and 2) determine compliance with permit conditions and ultimately the attainment of WQS. The first type of monitoring should be conducted during the Phase II permit term and should be sufficient to evaluate water quality impacts of CSOs on the receiving water bodies and to evaluate the effectiveness of CSO controls during the construction/implementation period. The latter type of monitoring should be conducted after construction of selected CSO controls has been completed and should be required in the first post-Phase II permit (see Chapter 5).

The proposed post-construction compliance monitoring plan should be submitted as part of the LTCP. The plan should describe a monitoring program that includes receiving water monitoring at the CSO outfall and outside the area of CSO impact. The types of pollutants and parameters to be included in either of these monitoring programs depend on the WQS in the receiving water body and might include chemical (e.g., biochemical oxygen demand, total suspended solids, metals, oil and grease, herbicides, pesticides), microbiological (e.g., fecal coliform), and biological (e.g., fish, benthic invertebrates, zooplankton) parameters. It is critical that the receiving water monitoring be coordinated with ongoing or planned State programs and monitoring efforts of other permittees within the same watershed to ensure effective use of resources by all parties.

Permit monitoring conditions should be clear and concise, maintaining flexibility to account for site-specific factors. Where possible, to ensure that the conditions are enforceable, the permit writer should develop permit conditions that incorporate specific elements of the submitted plan rather than general requirements. The permit writer may copy specific portions of the proposed plans into the permit.

Exhibit 4-5 presents an example of site-specific permit language. (The pollutants listed in Exhibit 4-5 are included as an example only and are not intended as a mandatory list of required monitoring parameters. Permit language and the list of pollutants to be monitored should be developed to reflect the permittee's site-specific characteristics.) In addition, the permit writer should require the permittee to monitor appropriate measures of success, developed as part of the LTCP.

EPA cautions the permit writer against requiring implementation of the monitoring plan by reference. This approach might be more difficult to enforce because of the possible ambiguity of such language.

If CSOs are causing substantial water quality impacts, the permit writer may want to require special characterization studies, including the following:

- Sediment studies
- Whole effluent toxicity testing
- Biological assessments.

This type of monitoring, generally a short-term study, can be required as a special condition. Typically, such a study is required in response to specific information indicating that water quality is being affected. The permit writer may want to develop permit conditions that require: 1) a separate monitoring plan to be developed for each special study, 2) the plan be submitted for review prior to performing the monitoring, and 3) the submission of a final report to the permitting authority within a specified time after study completion.

Exhibit 4-5. Example Permit Language for Site-Specific Monitoring Activities

Site-Specific Language:

The permittee shall monitor CSOs and report results to the permitting authority in accordance with the following:

Characteristic			Monitoring Requirements	
Reporting Code	**Units**	**Parameter***	**Measurement Frequency**	**Sample Type**
		Ammonia		Grab
		Ammonia		Composite
		BOD_5		Grab
		BOD_5		Composite
		Phosphorus		Composite
		Total Suspended Solids		Grab
		Total Suspended Solids		Composite
		Fecal Coliform Bacteria		Grab

1. *The grab sample shall be collected within **[insert appropriate number]** minutes of the discharge at the following CSO outfalls **[insert appropriate identification]**. The grab sample shall be collected **[insert appropriate number]** times per year.*

2. *The composite sample shall be collected from the start of the discharge until it stops, with the sample period not to exceed 24 hours at the following CSO outfalls **[insert appropriate identification]**. The composite sample shall be collected **[insert appropriate number]** times per year, **[insert appropriate number]** times during the period from May - October and **[insert appropriate number]** times during the period from November - April. The permittee shall submit the results no later than November 30th and May 31st, respectively.*

***Parameters listed in this exhibit are examples only. The list of parameters to monitor must be developed on a site-specific basis.**

The permit writer should review the monitoring plans carefully to verify that the design ensures that CSO information is correlated with water quality impacts; otherwise, the results of the studies might not provide conclusive evidence of the cause of impact. In addition, other studies might be needed in conjunction with these special studies. For example, sediment studies might not be meaningful without a contaminant transport modeling study, and a bioassay performed without toxicity data and CSO data might not provide meaningful results.

For additional information on these types of testing, the permit writer is referred to the *Combined Sewer Overflows—Guidance for Monitoring and Modeling* (EPA, 1995d).

4.8 REPORTING

Four types of reporting requirements relating to CSO controls should be included in the Phase II permit: 1) re-evaluations associated with and reports/recordkeeping to document continued implementation of the NMC, 2) progress reports associated with implementation of long-term CSO controls, 3) monitoring data, and 4) other pertinent information (e.g., sensitive area reassessment):

- **NMC Implementation**—Examples of recordkeeping requirements associated with the ongoing implementation of the NMC have been incorporated into the example permit language associated with NMC implementation (see Section 4.3.2). The permit writer may choose to require reporting of any of this information. In addition, if the permit writer chooses to require any re-evaluations associated with any of the minimum controls, such as a reassessment of the pretreatment program or additional revisions to the municipal ordinance, the permit writer may require reporting of these re-evaluations.

- **LTCP Implementation - Progress Reports**—Because the implementation of the LTCP may be phased, the permit writer may require progress reports associated with the implementation of CSO controls. Exhibit 4-6 presents example permit language for requiring the submission of progress reports.

Exhibit 4-6. Example Permit Language for Requiring Submission of Progress Reports

> Within 14 days of each completion date specified in **[insert appropriate section]** of this permit, the permittee shall submit a written progress report to the permitting authority stating whether or not the particular activity was completed. If the activity was not completed, the report shall also include (1) an explanation of the failure to accomplish the activity, (2) actions taken by the permittee to correct the situation, and (3) an estimate of when the activity will be completed.

- **Monitoring Data**—Monitoring data collected during Phase II should be submitted to the NPDES permitting authority on a scheduled basis. Exhibit 4-5 provides example permit language that includes reporting requirements for Phase II monitoring.

- **Other Information**—The permit writer should consider other applicable reporting requirements. Depending on whether the permittee has chosen to implement the presumption or the demonstration approach, for example, it might be appropriate to require the permittee to report the number of overflow events or document other

controls selected. This manual does not provide example permit language for the demonstration approach because such language will be site-specific and based on the permittee's demonstration. However, the permit writer should attempt to draft permit language in terms of performance standards or other clear specific standards similar in type to the examples provided in Exhibit 4-4 for the presumption approach. Not all selected CSO controls (e.g., extensive use of BMPs) lend themselves to specific numeric performance standards. However, the permit writer should still attempt to develop permit conditions that will hold the permittee accountable for implementing CSO controls as planned (e.g., specifying implementation and scheduled evaluation of BMPs).

4.7 MONITORING

Monitoring is generally necessary to 1) evaluate the water quality impacts from CSOs on receiving waters and the effectiveness of CSO controls and 2) determine compliance with permit conditions and ultimately the attainment of WQS. The first type of monitoring should be conducted during the Phase II permit term and should be sufficient to evaluate water quality impacts of CSOs on the receiving water bodies and to evaluate the effectiveness of CSO controls during the construction/implementation period. The latter type of monitoring should be conducted after construction of selected CSO controls has been completed and should be required in the first post-Phase II permit (see Chapter 5).

The proposed post-construction compliance monitoring plan should be submitted as part of the LTCP. The plan should describe a monitoring program that includes receiving water monitoring at the CSO outfall and outside the area of CSO impact. The types of pollutants and parameters to be included in either of these monitoring programs depend on the WQS in the receiving water body and might include chemical (e.g., biochemical oxygen demand, total suspended solids, metals, oil and grease, herbicides, pesticides), microbiological (e.g., fecal coliform), and biological (e.g., fish, benthic invertebrates, zooplankton) parameters. It is critical that the receiving water monitoring be coordinated with ongoing or planned State programs and monitoring efforts of other permittees within the same watershed to ensure effective use of resources by all parties.

Permit monitoring conditions should be clear and concise, maintaining flexibility to account for site-specific factors. Where possible, to ensure that the conditions are enforceable, the permit writer should develop permit conditions that incorporate specific elements of the submitted plan rather than general requirements. The permit writer may copy specific portions of the proposed plans into the permit.

Exhibit 4-5 presents an example of site-specific permit language. (The pollutants listed in Exhibit 4-5 are included as an example only and are not intended as a mandatory list of required monitoring parameters. Permit language and the list of pollutants to be monitored should be developed to reflect the permittee's site-specific characteristics.) In addition, the permit writer should require the permittee to monitor appropriate measures of success, developed as part of the LTCP.

EPA cautions the permit writer against requiring implementation of the monitoring plan by reference. This approach might be more difficult to enforce because of the possible ambiguity of such language.

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- Sediment studies
- Whole effluent toxicity testing
- Biological assessments.

This type of monitoring, generally a short-term study, can be required as a special condition. Typically, such a study is required in response to specific information indicating that water quality is being affected. The permit writer may want to develop permit conditions that require: 1) a separate monitoring plan to be developed for each special study, 2) the plan be submitted for review prior to performing the monitoring, and 3) the submission of a final report to the permitting authority within a specified time after study completion.

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		Ammonia		Composite
		BOD_5		Grab
		BOD_5		Composite
		Phosphorus		Composite
		Total Suspended Solids		Grab
		Total Suspended Solids		Composite
		Fecal Coliform Bacteria		Grab

1. *The grab sample shall be collected within **[insert appropriate number]** minutes of the discharge at the following CSO outfalls **[insert appropriate identification]**. The grab sample shall be collected **[insert appropriate number]** times per year.*

2. *The composite sample shall be collected from the start of the discharge until it stops, with the sample period not to exceed 24 hours at the following CSO outfalls **[insert appropriate identification]**. The composite sample shall be collected **[insert appropriate number]** times per year, **[insert appropriate number]** times during the period from May - October and **[insert appropriate number]** times during the period from November - April. The permittee shall submit the results no later than November 30th and May 31st, respectively.*

***Parameters listed in this exhibit are examples only. The list of parameters to monitor must be developed on a site-specific basis.**

The permit writer should review the monitoring plans carefully to verify that the design ensures that CSO information is correlated with water quality impacts; otherwise, the results of the studies might not provide conclusive evidence of the cause of impact. In addition, other studies might be needed in conjunction with these special studies. For example, sediment studies might not be meaningful without a contaminant transport modeling study, and a bioassay performed without toxicity data and CSO data might not provide meaningful results.

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4.8 REPORTING

Four types of reporting requirements relating to CSO controls should be included in the Phase II permit: 1) re-evaluations associated with and reports/recordkeeping to document continued implementation of the NMC, 2) progress reports associated with implementation of long-term CSO controls, 3) monitoring data, and 4) other pertinent information (e.g., sensitive area reassessment):

- **NMC Implementation**—Examples of recordkeeping requirements associated with the ongoing implementation of the NMC have been incorporated into the example permit language associated with NMC implementation (see Section 4.3.2). The permit writer may choose to require reporting of any of this information. In addition, if the permit writer chooses to require any re-evaluations associated with any of the minimum controls, such as a reassessment of the pretreatment program or additional revisions to the municipal ordinance, the permit writer may require reporting of these re-evaluations.

- **LTCP Implementation - Progress Reports**—Because the implementation of the LTCP may be phased, the permit writer may require progress reports associated with the implementation of CSO controls. Exhibit 4-6 presents example permit language for requiring the submission of progress reports.

Exhibit 4-6. Example Permit Language for Requiring Submission of Progress Reports

> Within 14 days of each completion date specified in **[insert appropriate section]** of this permit, the permittee shall submit a written progress report to the permitting authority stating whether or not the particular activity was completed. If the activity was not completed, the report shall also include (1) an explanation of the failure to accomplish the activity, (2) actions taken by the permittee to correct the situation, and (3) an estimate of when the activity will be completed.

- **Monitoring Data**—Monitoring data collected during Phase II should be submitted to the NPDES permitting authority on a scheduled basis. Exhibit 4-5 provides example permit language that includes reporting requirements for Phase II monitoring.

- **Other Information**—The permit writer should consider other applicable reporting requirements. Depending on whether the permittee has chosen to implement the presumption or the demonstration approach, for example, it might be appropriate to require the permittee to report the number of overflow events or document other

performance standards. The permit writer may also require the permittee to provide "measures of success" data not otherwise reported as part of the monitoring data. Such data might include a reduction in the number of overflow events, reduction in number of CSO outfalls, volume of untreated/treated CSOs, or other improvements in receiving water quality. Section 2.9 discusses the different types of measures of success for the CSO program. In addition, any reassessments recommended by the CSO Control Policy, such as the reassessment of CSOs to sensitive areas, should also be submitted to the NPDES permitting authority. Section 4.9.2 discusses special conditions regarding sensitive areas.

4.9 SPECIAL CONDITIONS

This section discusses three special conditions: 1) CSO-related bypasses, 2) sensitive area reassessment, and 3) reopener clauses. The sensitive area reassessment special condition should appear in any CSO permit where a CSO occurs to a sensitive area and the permittee is not planning to eliminate or relocate the CSO outfalls from that area during the permit term. The reopener clause should appear in all Phase II permits.

4.9.1 CSO-Related Bypass

Some POTW treatment plants might have significant primary treatment capacity in excess of their secondary treatment capacity. During development of the LTCP, a community might want to consider using this excess primary treatment capacity as one CSO control alternative, which may be used in conjunction with other CSO control alternatives to ensure compliance with CWA requirements. The CSO Control Policy outlines a process for "CSO-related bypass" whereby, under certain circumstances, the permit writer may allow wet weather flows to receive primary clarification at the POTW treatment plant and then be discharged, without these flows being subject to secondary treatment requirements.

"Bypass," the intentional diversion of waste streams from any portion of a treatment facility, is prohibited by NPDES regulations unless the requirements of 40 CFR 122.41(m) are met. Under the regulations, to take advantage of the bypass provisions, the permittee must show that the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, that there was no feasible alternative to the bypass, and that the permittee submitted the

required notices. After considering "its adverse effects," the NPDES permitting authority may approve an anticipated bypass if the permittee has met these three conditions.

The permittee is normally responsible for documenting compliance with 40 CFR 122.41(m) on a case-by-case basis. In the CSO Control Policy, EPA interpreted these regulations to allow authorization, by permit condition, of a CSO-related bypass of the secondary treatment portion of the POTW treatment plant in specific limited circumstances. For permittees with excess primary capacity at the POTW treatment plant, the permit writer may consider including a CSO-related bypass provision in the permit. When considering whether such a condition is appropriate, the permit writer should consult the information and justification for the bypass submitted in the permittee's LTCP. In addition to presenting information in the LTCP documenting compliance with the baseline requirements of 40 CFR 122.41(m), the CSO Control Policy states that, at a minimum, the LTCP "should provide justification for the cut-off point at which the flow will be diverted from the secondary treatment portion of the treatment plant, and provide a benefit-cost analysis demonstrating that conveyance of wet weather flow to the POTW for primary treatment is more beneficial than other CSO abatement alternatives such as storage and pump back for secondary treatment, sewer separation, or satellite treatment."

For purposes of applying the bypass regulation to CSOs, "severe property damage" could include situations where flows above a certain level could wash out the POTW's secondary treatment system. The "no feasible alternative" requirement of the regulation can be met if the record demonstrates that the secondary treatment system is properly operated and maintained, that the system has been designed to meet secondary limits for flows greater than the peak dry weather flow plus an appropriate quantity of wet weather flow, and that it is either technically or financially infeasible to provide secondary treatment for greater amounts of wet weather flow. This analysis should include, for example, consideration of enhanced primary treatment and non-biological secondary treatment, as well as additional construction to increase plant capacity. The NPDES permitting authority may grant interim authorization to bypass that results from wet weather flows, which, in the absence of implementation of the nine minimum controls, would be untreated from a CSO without consideration of the feasibility of additional construction.

Where such interim authorization is granted, however, the permit must specify that the permittee is required, as part of its LTCP, to implement all feasible alternatives to bypass, including additional construction at the facility or other controls within the collection system. Other bases supporting a finding of no feasible alternative might also be available on a case-by-case basis. As part of the consideration of possible adverse effects resulting from the bypass, the permit writer must determine that the bypass will not cause exceedances of WQS.

Based on the technical justification developed and submitted by the permittee, the permit writer should include in the permit the conditions under which a CSO-related bypass would be authorized, as well as specify any required treatment, monitoring, or effluent limitations related to the bypass event. The permit writer should also include requirements for appropriate notification of the CSO-related bypass to the NPDES permitting authority. The CSO Control Policy recommends that the permit require all wet weather flows passing the headworks of the POTW treatment plant to receive at least primary clarification, solids and floatables removal and disposal, disinfection (where necessary), and any other treatment that can reasonably be provided. The permit writer may specify monitoring requirements to determine whether a substantial increase in the volume or character of pollutants introduced to the POTW occurs. If the POTW is required to disinfect bypassed flows, and if chlorine is used to disinfect, the permit writer may apply effluent limitations for total residual chlorine to ensure protection of receiving water quality and attainment of WQS.

As stated previously, the CSO Control Policy recommends that the LTCP provide adequate justification for the CSO-related bypass and clearly define the wet weather flow conditions and flow rate at which secondary treatment capacity is exceeded. In addition, the CSO Control Policy recommends that the permittee demonstrate that conveying combined sewage to the POTW treatment plant for primary treatment is more beneficial than other options, based on a cost/performance analysis. The permit writer should use this information to draft a site-specific CSO-related bypass provision that specifies the flow rate at which the CSO-related bypass will be allowed; any appropriate treatment, monitoring, or effluent limitations; or other CSO-related bypass requirements. The permit language should indicate that bypasses that occur

when the flow at the time of the bypass is under the specified flow rate are not authorized by the CSO-related bypass condition. The permit writer should compile sufficient data and information in the administrative record and in the permit fact sheet or statement of basis supporting all the requirements in 40 CFR 122.41(m)(4) for approval of an anticipated bypass. Exhibit 4-7 presents an example of permit language for a CSO-related bypass. The permit writer should evaluate this language carefully to ensure that is appropriate for the permittee.

Exhibit 4-7. Example Permit Language for a CSO-Related Bypass

A CSO-related bypass of the secondary treatment portion of the POTW treatment plant is authorized when the flow rate to the POTW treatment plant as a result of a precipitation event exceeds **[insert flow rate in MGD]**. Bypasses that occur when the flow at the time of the bypass is under the specified flow rate are not authorized under this condition and are subject to the bypass provision at 40 CFR 122.41(m). In the event of a CSO-related bypass authorized under this condition, the permittee shall minimize the discharge of pollutants to the environment. At a minimum, CSO-related bypass flows must receive primary clarification, solids and floatables removal, and disinfection. The permittee shall report any substantial changes in the volume or character of pollutants being introduced into the POTW. Authorization of CSO-related bypasses under this provision may be modified or terminated when there is a substantial change in the volume or character of pollutants being introduced to the POTW. The permittee shall provide notice to the permitting authority of bypasses authorized under this provision with 24 hours of occurrence of the bypass.

4.9.2 Reassessment of Sensitive Areas

Under the CSO Control Policy, the permittee's LTCP should give the highest priority to controlling CSOs to sensitive areas, as defined by the NPDES permitting authority. The goal for controlling CSOs to these areas is to eliminate the CSOs or relocate them whenever it is physically possible and economically achievable. If it is not possible, then the permittee should be required to treat the CSOs that are not eliminated or relocated to the degree necessary to provide for the attainment of WQS.

For CSOs to sensitive areas that were not eliminated or relocated, the permit writer should include in the initial Phase II permit, and in subsequent permits, a special condition requiring the permittee to reassess the feasibility of doing so. The permit writer should require the permittee to develop and submit a report on this reassessment. The permit writer should require the permittee to evaluate the availability of new technologies that might be useful in eliminating or relocating these CSOs and any changes in the permittee's economic situation that

would enable the permittee to fund the required projects for eliminating or relocating the CSOs from sensitive areas. Exhibit 4-8 provides example permit language for reassessment of sensitive areas for use in Phase II and subsequent permits. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee.

Exhibit 4-8. Example Permit Language for Sensitive Area Reassessment

[This permit condition is only appropriate for CSSs with CSOs to sensitive areas that have not been eliminated or relocated.]

The permittee shall reassess the feasibility of eliminating or relocating CSO outfalls **[insert outfall identification numbers for CSOs to sensitive areas]** discharging to **[insert name of receiving water body or bodies corresponding to each outfall identified].** The permittee shall consider new or improved techniques to eliminate or relocate overflows or changed circumstances that influence economic achievability. The permittee shall prepare and submit to the permitting authority a report that presents the results of this reassessment, including the permittee's recommendations regarding the elimination or relocation of these outfalls. The permittee shall submit such report no later than **[insert date].**

4.9.3 Permit Reopener Clause

As with any NPDES permit, the Phase II permit should include a reopener clause that authorizes the NPDES permitting authority to modify or revoke and reissue the Phase II permit for cause. Such cause could include a determination that the selected CSO controls fail to provide for the attainment of WQS or WQS are revised to address wet weather conditions on the basis of a use attainability analysis.

Modifying the Phase II permit will require the modification of any enforcement mechanism issued with the Phase II permit to maintain consistency with the modified or reissued Phase II permit. For this reason, the permit writer should coordinate with the appropriate NPDES enforcement authority when a Phase II permit is reopened.

Before exercising any reopener provision, the permit writer should consider the timing of the scheduled permit reissuance. If it is late in the five-year permit cycle, the permit writer may want to address the changes in the context of the normal permit reissuance process. The

NPDES permitting authority might have standard procedures that govern the use of reopener clauses, and the permit writer should follow these procedures when appropriate.

It is possible that a generic reopener clause used in other NPDES permits is sufficiently broad to address CSOs. Alternatively, the permit writer may revise the generic reopener clause to specifically include the CSO-related causes for which the Phase II permit may be reopened, or the permit writer may include a separate reopener clause that only identifies the CSO-related causes for which the Phase II permit may be reopened. Exhibit 4-9 presents example language for the latter case. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. EPA's *Training Manual for NPDES Permit Writers* presents additional information on the use of standard reopener clauses in NPDES permits (EPA, 1993).

Exhibit 4-9. Example Permit Language for Reopener Clauses

This permit may be modified or revoked and reissued, as provided pursuant to 40 CFR 122.62 and 124.5, for the following reasons:

- To include new or revised conditions developed to comply with any State or Federal law or regulation that addresses CSOs that is adopted or promulgated subsequent to the effective date of this permit
- To include new or revised conditions if new information, not available at the time of permit issuance, indicates that CSO controls imposed under the permit have failed to ensure the attainment of State WQSs
- To include new or revised conditions based on new information resulting from implementation of the long-term control plan.

In addition, this permit may be modified or revoked and reissued for any reason specified in 40 CFR 122.62.

CHAPTER 5
POST-PHASE II PERMITTING

5.1 CONTINUATION OF PHASE II

The permit writer's responsibilities continue even after issuance of the first Phase II permit requiring implementation of the selected combined sewer overflow (CSO) controls from the long-term control plan (LTCP). Phase II, in many cases, may extend through numerous five-year National Pollutant Discharge Elimination System (NPDES) permit cycles. The number of cycles will depend on the length of time necessary to complete construction of the selected CSO controls. In cases where construction will take more than five years, the permit writer should coordinate with the NPDES enforcement authority to ensure that a compliance schedule for implementation of CSO controls is contained in an appropriate enforceable mechanism.

The permit writer should continue to include in subsequent Phase II permits any conditions that require the permittee to implement the selected CSO controls, continue implementation of the nine minimum controls and require reassessment of overflows to sensitive areas. The requirement to implement the post-construction compliance monitoring program should be included in a Phase II permit to evaluate water quality impacts from CSOs and the effectiveness of CSO controls (in cases where some of the selected CSO controls have been completed) and in the first post-Phase II permit to determine compliance with permit conditions and ultimately the attainment of WQS. Chapter 4 provides specific information on these Phase II permit conditions.

In addition, the permit writer should continue to work closely with the permittee during these subsequent permit cycles. The permit writer should continue to require the permittee to periodically report the status of implementation of the selected CSO controls (see Section 4.8). Continued involvement by the permit writer is critical to the development of the NPDES permit following implementation of the selected CSO controls.

5.2 SUBSEQUENT CSO PERMITTING

Prior to issuing the NPDES permit for the period in which the permittee's implementation of selected CSO controls is expected to be completed, the permit writer should reach an agreement with the permittee on the implementation of a post-construction compliance monitoring program (prepared during development of the LTCP) that will generate information and data necessary to determine whether the selected CSO controls are achieving compliance with applicable State water quality standards (WQS). The permit writer should generally incorporate the requirement to conduct this post-construction monitoring program into the first NPDES permit issued following completed construction of the selected CSO controls. Additionally, when enough water quality data have been generated, the permit writer should use the data to develop numeric water quality-based effluent limits as appropriate for inclusion in subsequent NPDES permits.

When using the data and information generated by the permittee under the Phase II permit(s) to develop numeric water quality-based effluent limits, the permit writer should consider the following questions:

- Were CSO frequency, duration, and volumes estimated or measured?
- Were all pollutants of concern identified, including toxics, and were overflow concentrations/loadings for each pollutant estimated or measured?
- Did the permittee identify and monitor for pollutants addressed by applicable State water quality criteria?
- Did the permittee obtain data on ambient background concentrations of pollutants of concern?
- Were appropriate flow values for receiving water bodies used? State WQS may specify the flows under which water quality criteria must be achieved.
- If applicable, were mixing zones calculated in accordance with State standards or policies?
- Was the cumulative impact of multiple CSOs to the same receiving water body considered?

- Were other point and nonpoint sources of pollutants within the same watershed considered?
- Was the model used suitable for wet weather episodic discharges?
- Were antecedent conditions appropriately used in setting up the model?
- Was information obtained on the most sensitive and most affected areas (e.g., shellfish propagation, drinking water supply)?

The permit writer might need additional information and data depending on the policies and procedures used by the NPDES permitting authority to evaluate water quality impacts and develop numeric water quality-based effluent limits. The scientific/technical issues affecting determination of the need for water quality-based effluent limits for CSOs might be different from those commonly used by permit writers for continuous wastewater discharges from other point source categories. For example, use of chronic criteria designed for a particular low flow scenario might not apply during wet weather flow conditions when CSOs are likely to occur. In addition, State WQS might have been revised to better reflect receiving water body uses during wet weather conditions.

Therefore, the U.S. Environmental Protection Agency recommends that the permit writer involve appropriate WQS authorities in evaluating whether CSOs will achieve WQS and developing numeric water quality-based effluent limits. The *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) might provide some insight in developing water quality-based effluent limitations. Although this EPA manual is intended to address continuous discharges, it may provide useful information for wet weather flows.

Due to the possible combined effect of pollutant sources (e.g., other point and nonpoint sources) or the existing condition of the receiving water body, chemical-specific water quality-based effluent limits established specifically for CSOs might not result in the attainment of WQS for a particular receiving water body. In these cases, the NPDES permitting authority should consider developing one or more total maximum daily loads (TMDLs) for the receiving water body for the pollutants in CSOs exceeding WQS. (See Section 3.5.1.4 for additional discussion

of TMDLs.) If a TMDL is established for a receiving water body to control all pollutant sources of a particular pollutant, the numeric water quality-based effluent limits for that pollutant in a CSO must be consistent with the wasteload allocation established for the CSOs (see 40 CFR 122.44(d)(1)(vii)(B)).

After the permittee has completed construction of the selected CSO controls, the permit writer can consider for the last Phase II permit or the first post-Phase II permit the use of biocriteria, sediment criteria, and whole effluent toxicity testing to evaluate the overall effect of CSOs on receiving water bodies. Use of these requirements will depend on the need to 1) assess toxicity in the receiving water body, 2) prevent future impacts, or 3) remediate existing receiving water body degradation. Again, the permit writer should consult with the appropriate State WQS authorities and enforcement staff to determine whether such requirements in the permit are warranted and to establish the specific requirements for the CSOs of concern.

APPENDIX A
COMPILATION OF EXAMPLE CSO PERMIT CONDITIONS

This appendix is a compilation of all of the example CSO permit conditions contained in the exhibits in Chapters 3 and 4 of this manual. it is intended for reference purposes only, and does not necessarily represent the Agency's recommendations for CSO permit language in all cases. Permit conditions should be developed based on careful consideration of site-specific factors.

PHASE I PERMIT

The permittee is authorized to discharge from the CSO outfalls listed below and additional CSO outfalls within the boundaries of the permittee's jurisdiction identified after the effective date of the permit. The permittee shall ensure that all CSOs from the CSS comply with the requirements of **[insert appropriate permit sections containing CSO requirements]** and other pertinent portions of this permit.

Outfall Number	Overflow Outfall Location	Receiving Water Body
[insert number]	**[insert latitude/longitude (street address optional)]**	**[insert name of receiving water body]**

I. Effluent Limits

A. Technology-based requirements for CSOs

The permittee shall comply with the following technology-based requirements:

1. The permittee shall implement proper operation and maintenance programs for the sewer system and all CSO outfalls to reduce the magnitude, frequency, and duration of CSOs. The program shall consider regular sewer inspections; sewer, catch basin, and regulator cleaning; equipment and sewer collection system repair or replacement, where necessary; and disconnection of illegal connections.

2. The permittee shall implement procedures that will maximize use of the collection system for wastewater storage that can be accommodated by the storage capacity of the collection system in order to reduce the magnitude, frequency, and duration of CSOs.

3. The permittee shall review and modify, as appropriate, its existing pretreatment program to minimize CSO impacts from the discharges from nondomestic users.

   [Alternative language for a permittee without an approved pretreatment program:] The permittee shall evaluate the CSO impacts from nondomestic users and take appropriate steps to minimize such impacts.

4. The permittee shall operate the POTW treatment plant at maximum treatable flow during all wet weather flow conditions to reduce the magnitude, frequency, and duration of CSOs. The permittee shall deliver all flows to the treatment plant within the constraints of the treatment capacity of the POTW.

5. Dry weather overflows from CSO outfalls are prohibited. Each dry weather overflow must be reported to the permitting authority as soon as the permittee becomes aware of the overflow. When the permittee detects a dry weather overflow, the permittee shall begin corrective action immediately. The permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated.

6. The permittee shall implement measures to control solid and floatable materials in CSOs.

7. The permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.

8. The permittee shall implement a public notification process to inform citizens of when and where CSOs occur. The process must include (a) a mechanism to alert persons of the occurrence of CSOs and (b) a system to determine the nature and duration of conditions that are potentially harmful for users of receiving waters due to CSOs.

9. The permittee shall monitor CSO outfalls to characterize CSO impacts and the efficacy of CSO controls. This shall include collection of data that will be used to document the existing baseline conditions, evaluate the efficacy of the technology-based controls, and determine the baseline conditions upon which the long-term control plan will be based. These data shall include:

   a. Characteristics of combined sewer system including the population served by the combined portion of the system and locations of all CSO outfalls in the CSS

   b. Total number of CSO events and the frequency and duration of CSOs for a representative number of events

   c. Locations and designated uses of receiving water bodies

   d. Water quality data for receiving water bodies

   e. Water quality impacts directly related to CSOs (e.g., beach closing, floatables wash-up episodes, fish kills).

B. Water quality-based requirements for CSOs

The permittee shall not discharge any pollutant at a level that causes or contributes to an in-stream excursion above numeric or narrative criteria developed and adopted as part of **[insert State name]** water quality standards.

Site-Specific Language:

1. *The permittee shall not discharge any floating debris, oil, grease, scum, foam, or other objectionable materials that may result in amounts sufficient to be unsightly or otherwise objectionable or to constitute a nuisance under State law.*

2. *The permittee shall not discharge settleable solids, sediments, sludge deposits, or suspended particles that may coat or cover submerged surfaces.*

3. *The permittee shall not discharge any pollutants that may impart undesirable odors, tastes, or colors to the receiving water body or to the aquatic life found therein, may endanger public health, or may result in the dominance of nuisance species.*

II. Reporting Requirements

A. Reporting implementation of nine minimum controls

The permittee shall submit documentation that demonstrates implementation of each of the nine minimum controls that includes the elements below. The permittee shall submit this documentation to the permitting authority on or before **[insert due date]**.

[insert appropriate list of documentation items]

III. Long-Term Control Plan

The permittee shall develop a long-term control plan that will include the elements contained in Sections III.A through III.D below and shall submit the plan elements in accordance with the schedule contained in Section III.E:

A. Public Participation

The permittee shall prepare and implement a public participation plan that outlines how the permittee will ensure participation of the public throughout the long-term control plan development process.

B. CSS Characterization

The permittee shall develop and implement a plan that will result in a comprehensive characterization of the CSS developed through records review, monitoring, modeling, and other means as appropriate to establish the existing baseline conditions, evaluate the efficacy of the CSO technology-based controls, and determine the baseline conditions upon which the long-term control plan will be based. The characterization shall adequately address the response of the CSS to various precipitation events; identify the number, location, frequency, and characteristics of CSOs; and identify water quality impacts that result from CSOs.

To complete the characterization, the permittee shall employ the following methods:

1. Rainfall Records Review. The permittee shall examine the complete rainfall records for the geographic areas of the CSS and evaluate the flow variations in the receiving water body to correlate between the CSOs and receiving water conditions.

2. CSS Records Review. The permittee shall review and evaluate all available CSS records and undertake field inspections and other necessary activities to identify the number, location, and frequency of CSOs and their location relative to sensitive areas (as identified in III.B.4) and to pollution sources, such as significant industrial users, in the collection system.

3. CSO and Water Quality Monitoring. The permittee shall develop and submit a monitoring program that measures the frequency, duration, flow rate, volume, and pollutant concentration of CSOs and assesses the impact of the CSOs on receiving waters. Monitoring shall be performed at a representative number of CSOs for a representative number of events. The monitoring program shall include CSOs and ambient receiving water body monitoring and, where appropriate, other monitoring protocols, such as biological assessments, toxicity testing, and sediment sampling.

4. Identification of Sensitive Areas. The permittee shall identify sensitive areas to which its CSOs occur. These areas shall include Outstanding National Resource Waters, National Marine Sanctuaries, waters with threatened or endangered species and their designated critical habitat, waters with primary contact recreation, public drinking water intakes or their designated protection areas, shellfish beds, and any other areas identified by the permittee or permitting authority, in coordination with appropriate State or Federal agencies.

5. CSS and Receiving Water Modeling. The permittee may employ models, which include appropriate calibration and verification with field measurements, to aid in the characterization. If models are used, they shall be identified by the permittee along with an explanation of why the model was selected and used in the characterization.

C. CSO Control Alternatives

1. Development of CSO Control Alternatives. The permittee shall develop a range of CSO control alternatives that would be necessary to achieve **[insert appropriate range of levels of control (e.g., zero overflow events per year, an average of 1 to 3, 4 to 7, and 8 to 12 overflow events per year)]**. The permittee shall consider expansion of the POTW treatment plant secondary and primary capacity as an alternative.
   Alternatives presented must give the highest priority to controlling CSOs to the sensitive areas identified in III.B.4 above. For such areas, the alternatives included in the plan must (1) prohibit new or significantly increased CSOs, (2) eliminate or relocate CSOs from such areas wherever physically possible and economically achievable, except where elimination or relocation would provide less environmental protection than additional treatment, (3) where elimination or relocation is not physically possible or economically achievable or would provide less environmental protection than additional treatment, provide the level of treatment for remaining CSOs deemed necessary to meet water quality standards for full protection of existing and designated uses.

2. Evaluation of CSO Control Alternatives. The permittee shall evaluate each of the alternatives developed in accordance with III.C.1 to select the CSO controls that will ensure compliance with CWA requirements.

3. Cost/Performance Considerations. The permittee shall develop and submit cost/performance curves that demonstrate the relationship among the set of CSO control alternatives that correspond to the ranges identified in III.C.1 above.

D. Selected CSO Controls

Once the permittee has selected the CSO controls in consultation with the permitting authority, the permittee shall submit the following:

1. Implementation Schedule. The permittee shall submit a construction schedule for the selected CSO controls as part of the implementation schedule. Such schedules may be phased based on the relative importance of the adverse impacts on water quality standards and on the permittee's financial capability.

2. Operational Plan. The permittee shall submit a revised operation and maintenance plan that addresses implementation of the selected CSO controls. The revised operation and maintenance plan shall maximize the removal of pollutants during and after each precipitation event using all available facilities within the collection and treatment system.

3. Post-Construction Compliance Monitoring Program. The permittee shall develop and submit a post-construction monitoring program that (a) is adequate to ascertain the

effectiveness of the CSO controls and (b) can be used to verify attainment of water quality standards. The program shall include a plan that details the monitoring protocols to be followed, including CSO and ambient monitoring and, where appropriate, other monitoring protocols, such as biological assessments, whole effluent toxicity testing, and sediment sampling.

E. Schedule and Interim Deliverables

The following reports shall be developed in accordance with the requirements specified in Sections III.A through III.D and submitted to the permitting authority by the dates specified below:

1. Public Participation Plan, as required in Section III.A, shall be submitted on or before **[insert due date]**.

2. CSS Characterization Monitoring and Modeling Plan, as required in Section III.B, shall be submitted on or before **[insert due date]**.

3. CSS Characterization Monitoring and Modeling Results, including identification of sensitive areas, as required in Section III.B, shall be submitted on or before **[insert due date]**.

4. CSO Control Alternatives Identification, as required in Section III.C.1, shall be submitted on or before **[insert due date]**.

5. CSO Controls Evaluation and Cost Performance Curves for the selected CSO controls, as required in Sections III.C.2 and 3, shall be submitted on or before **[insert due date]**.

6. Implementation Schedule, as required in Section III.D.1, including any supporting analyses, shall be submitted on or before **[insert due date]**.

7. Operational Plan revised to reflect selected CSO controls, as required in Section III.D.2, shall be submitted on or before **[insert due date]**.

8. Post-Construction Compliance Monitoring Plan, as required in Section III.D.3, shall be submitted on or before **[insert due date]**.

IV. Special Conditions

This permit may be modified or revoked and reissued, as provided pursuant to 40 CFR 122.62 and 124.5, for the following reasons:

- To include new or revised conditions developed to comply with any State or Federal law or regulation that addresses CSOs that is adopted or promulgated subsequent to the effective date of this permit

- To include new or revised conditions if new information, not available at the time of permit issuance, indicates that CSO controls imposed under the permit have failed to ensure the attainment of State water quality standards

- To include new or revised conditions based on new information generated from the long-term control plan.

In addition, this permit may be modified or revoked and reissued for any reason specified in 40 CFR 122.62.

PHASE II PERMIT

The permittee is authorized to discharge from the outfalls listed below in accordance with the requirements of **[insert appropriate permit sections containing CSO requirements]** and other pertinent provisions of this permit.

Overflow Number	Overflow Outfall Location	Receiving Water Body
[insert number]	**[insert latitude/longitude (street address optional)]**	**[insert receiving water body]**

I. Effluent Limits

A. Technology-based requirements for CSOs

The permittee shall comply with the following technology-based requirements:

1. Conduct proper operations and regular maintenance programs. The permittee shall implement the operation and maintenance plan for the CSS that will include the elements listed below. The permittee also shall update the plan to incorporate any changes to the system and shall operate and maintain the system according to the plan. The permittee shall keep records to document the implementation of the plan.

   Site-Specific Language:

   Designation of a Manager for Combined Sewer System. The permittee shall designate a person to be responsible for the wastewater collection system and serve as the contact person regarding the CSS.

   Inspection and Maintenance of CSS. The permittee shall inspect and maintain all CSO structures, regulators, pumping stations, and tidegates to ensure that they are in good working condition and adjusted to minimize CSOs and prevent tidal inflow. The permittee shall inspect, or cause to be inspected, each CSO outfall at an appropriate frequency to ensure no dry weather overflows are occurring. The inspection shall include, but is not limited to, entering the regulator structure if accessible, determining the extent of debris and grit buildup, and removing any debris that may constrict flow, cause blockage, or result in a dry weather overflow. The permittee shall record in a maintenance log book the results of the inspections. For CSO outfalls that are inaccessible, the permittee may perform a visual check of the overflow pipe to determine whether or not the CSO is occurring during dry weather flow conditions.

   Provision for Trained Staff. The permittee shall ensure the availability of trained staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. Each staff member shall receive appropriate training.

Allocation of Funds for O&M. The permittee shall allocate adequate funds specifically for operation and maintenance activities. The permittee shall submit a certification of assurance from the appropriate local government entities that the necessary funds, equipment, and personnel have been or will be committed to carry out the O&M plan.

2. Maximize use of the collection system for storage. The permittee shall maximize the in-line storage capacity. The permittee shall keep records to document implementation.

Site-Specific Language:

The permittee shall 1) maintain all dams or diversion structures at their current heights (as of the date of permit issuance) or greater, 2) minimize discharges from the CSO outfall locations designated as ***[insert appropriate designation]*** *until the specified capacity of the* ***[named]*** *Combined Sewer Retention Basin is used to store the overflow for later treatment at the plant, and 3) keep records of the flow entering and leaving the* ***[named]*** *Combined Sewer Retention Basin*

3. Review and modify pretreatment program. The permittee shall continue to implement selected CSO controls to minimize the impact of nondomestic discharges on CSOs. The permittee shall re-evaluate at an appropriate frequency whether additional modifications to its pretreatment program are feasible or of practical value. The permittee shall keep records to document this evaluation and implementation of the selected CSO controls to minimize CSO impacts resulting from nondomestic discharges.

Site-Specific Language:

The permittee shall require significant industrial users (SIU's) discharging to the CSS to minimize batch discharges during wet weather conditions

[Alternative language for a permittee without an approved pretreatment program:] Actions to minimize impact of nondomestic discharges on CSOs. The permittee shall continue to implement selected CSO controls to minimize CSO impacts resulting from nondomestic discharges.

4. Maximize flow to POTW treatment plant. The permittee shall operate the POTW treatment plant at maximum treatable flow during wet weather flow conditions/events and deliver all flows to the treatment plant within the constraints of the capacity of the treatment plant. The permittee shall keep records to document these actions.

5. Prohibit combined sewer overflows during dry weather. Dry weather overflows from CSO outfalls are prohibited. All dry weather overflows must be reported to the permitting authority within **[insert appropriate number of days]** days of when the

permittee becomes aware of a dry weather overflow. When the permittee detects a dry weather overflow, the permittee shall begin corrective action immediately. The permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated. The permittee shall record in the inspection log book dry weather overflows, as well as the cause, corrective measures taken, and the dates of beginning and cessation of overflow.

6. Control solid and floatable materials in CSOs. The permittee shall implement measures to control solid and floatable materials in CSOs.

   Site-Specific Language:

   These control measures shall include:

   - *Measures to ensure that baffles are in place to control overflows from the diversion structures or that other means are used to reduce the volume of floatables.*
   - *Inspection and maintenance of the sewer system so that solid or floatable materials greater than [insert size] are not present in CSOs.*

7. Develop and implement pollution prevention program. The permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters. The permittee shall keep records to document pollution prevention implementation activities.

   Site-Specific Language:

   This program shall include:

   - *Street sweeping and catch basin modification or cleaning at an appropriate frequency to prevent large accumulations of pollutants and debris*
   - *A public education program that informs the public of the permittee's local laws that prohibit littering and the use of phosphate-containing detergents and pesticides.*
   - *An oil recycling program.*

8. Notify the public of CSOs. The permittee shall continue to implement a public notification plan to inform citizens of when and where CSOs occur. The process must include:

   a. A mechanism to alert persons using all receiving water bodies affected by CSOs

   b. A system to determine the nature and duration of conditions that are potentially harmful to users of these receiving water bodies due to CSOs.

The permittee shall keep records documenting public notification.

Site-Specific Language:

Within 3 months of the effective date of this permit, the permittee shall install and maintain identification signs at all CSO outfalls owned and operated by the permittee. The permittee must place the signs at or near the CSO outfalls and ensure that the signs are easily readable by the public.

9. Monitor to effectively characterize CSO impacts and the efficacy of CSO controls. The permittee shall regularly monitor CSO outfalls to effectively characterize CSO impacts and the efficacy of CSO controls.

B. Water quality-based requirements for CSOs

The permittee shall not discharge any pollutant at a level that causes or contributes to an in-stream excursion above numeric or narrative criteria adopted as part of **[insert State name]** water quality standards.

The permittee shall comply with the following performance standards. These standards shall apply during **[insert average design conditions upon which controls are based]**.

1. **[The permit writer should select the appropriate standard below.]**

The permittee shall discharge no more than an average of **[insert appropriate number: 4, 5, or 6]** overflow events per year not receiving the treatment specified below.

[or]

The permittee shall eliminate or capture for treatment, or storage and subsequent treatment, at least 85 percent of the system-wide combined sewage volume collected in the combined sewer system during precipitation events under design conditions. Captured combined sewage shall receive the treatment specified below.

[or]

The permittee shall eliminate or remove the following mass of pollutants from the combined sewage volume collected in the combined sewer system during precipitation events under design conditions:

[**insert x**] pounds of [**insert pollutant**]
[**insert y**] pounds of [**insert pollutant**]

[Insert the following language only if the first or second alternative is chosen above.]
Any combined sewage captured shall receive a minimum of the following treatment:

- Primary clarification or equivalent.
- Solids and floatables disposal.
  [Insert appropriate disinfection requirements as necessary to meet State WQS.]
- Disinfection. Fecal coliform counts shall be maintained below **[insert applicable level]**.

[Insert appropriate dechlorination requirements if applicable based on State WQS.]

II. Long-Term Control Plan

The permittee shall implement and effectively operate and maintain the CSO controls identified in the long-term control plan. The implementation schedule for these controls shall be as follows:

Activity	Completion Date
[insert name of activity]	**[insert date]**

Site-Specific Language:

1.	*Retention basin*	
•	*Complete design of **[named]** retention basin.*	***[insert date]***
•	*Submit construction drawings for **[named]** retention basin*	***[insert date]***
•	*Initiate construction of **[named]** retention basin.*	***[insert date]***
•	*Complete construction of **[named]** retention basin.*	***[insert date]***
2.	***[Named street]** sewer separation*	
•	*Complete design.*	***[insert date]***
•	*Solicit bids.*	***[insert date]***
•	*Award contracts.*	***[insert date]***

NOTE: A compliance schedule exceeding the term of the permit may only be included in the permit if explicitly authorized in the applicable State WQS.

III. Monitoring Requirements

Site-Specific Language:

The permittee shall monitor CSOs and report results to the permitting authority in accordance with the following:

Characteristic			Monitoring Requirements	
Reporting Code	**Units**	**Parameter***	**Measurement Frequency**	**Sample Type**
		Ammonia		Grab
		Ammonia		Composite
		BOD_5		Grab
		BOD_5		Composite
		Phosphorus		Composite
		Total Suspended Solids		Grab
		Total Suspended Solids		Composite
		Fecal Coliform Bacteria		Grab

1. *The grab sample shall be collected within **[insert appropriate number]** minutes of the discharge at the following CSO outfalls **[insert appropriate identification]**. The grab sample shall be collected **[insert appropriate number]** times per year.*
2. *The composite sample shall be collected from the start of the discharge until it stops, with the sample period not to exceed 24 hours at the following CSO outfalls **[insert appropriate identification]**. The composite sample shall be collected **[insert appropriate number]** times per year, **[insert appropriate number]** times during the period from May - October and **[insert appropriate number]** times during the period from November - April. The permittee shall submit the results no later than November 30th and May 31st, respectively.*

***Parameters listed in this exhibit are examples only. The list of parameters to monitor must be developed on a site-specific basis.**

IV. Reporting Requirements

Within 14 days of each completion date specified in **[insert appropriate section]** of this permit, the permittee shall submit a written progress report to the permitting authority stating whether or not the particular activity was completed. If the activity was not completed, the report shall also include (1) an explanation of the failure to accomplish the activity, (2) actions taken by the permittee to correct the situation, and (3) an estimate of when the activity will be completed.

V. Special Conditions

A. CSO-related bypass.

A CSO-related bypass of the secondary treatment portion of the POTW treatment plant is authorized when the flow rate to the POTW treatment plant as a result of a precipitation event exceeds **[insert flow rate in MGD].** Bypasses that occur when the flow at the time of the bypass is under the specified flow rate are not authorized under this condition and are subject to the bypass provision at 40 CFR 122.41(m). In the event of a CSO-related bypass authorized under this condition, the permittee shall minimize the discharge of pollutants to the environment. At a minimum, CSO-related bypass flows must receive primary clarification, solids and floatables removal, and disinfection. The permittee shall report any substantial changes in the volume or character of pollutants being introduced into the POTW. Authorization of CSO-related bypasses under this provision may be modified or terminated when there is a substantial change in the volume or character of pollutants being introduced to the POTW. The permittee shall provide notice to the permitting authority of bypasses authorized under this provision with 24 hours of occurrence of the bypass.

B. Sensitive area reassessment.

[This permit condition is only appropriate for CSSs with CSOs to sensitive areas that have not been eliminated or relocated.]

The permittee shall reassess the feasibility of eliminating or relocating CSO outfalls **[insert outfall identification numbers for CSOs to sensitive areas]** discharging to **[insert name of receiving water body or bodies corresponding to each outfall identified]**. The permittee shall consider new or improved techniques to eliminate or relocate overflows or changed circumstances that influence economic achievability. The permittee shall prepare and submit to the permitting authority a report that presents the results of this reassessment, including the permittee's recommendations regarding the elimination or relocation of these outfalls. The permittee shall submit such report no later than **[insert date]**.

C. Reopener clause.

This permit may be modified or revoked and reissued, as provided pursuant to 40 CFR 122.62 and 124.5, for the following reasons:

- To include new or revised conditions developed to comply with any State or Federal law or regulation that addresses CSOs that is adopted or promulgated subsequent to the effective date of this permit
- To include new or revised conditions if new information, not available at the time of permit issuance, indicates that CSO controls imposed under the permit have failed to ensure the attainment of State WQSs

- To include new or revised conditions based on new information resulting from implementation of the long-term control plan.

In addition, this permit may be modified or revoked and reissued for any reason specified in 40 CFR 122.62.

APPENDIX B

DEVELOPMENT AND REVIEW OF MONITORING AND MODELING PLAN

The permit writer is likely to require the permittee to develop a monitoring and modeling plan. This may be required during the application process prior to the development of the permit or as a permit condition. If, during the review of the plan, the permit writer determines the plan is lacking information or the scope of the plan is inappropriate, the permit writer should note the deficiencies and require the plan to be modified and resubmitted. Development of the monitoring and modeling plan may require an iterative approach to match data, informational needs, and available resources. The plan may need to change as more knowledge is gained about the CSS and CSOs through the early steps of data collection.

Exhibit B-1 outlines the major elements the monitoring and modeling plan should generally contain. The permit writer should consider requesting that the permittee submit the monitoring and modeling plan in a specific format so that critical information can be taken from the plan and incorporated into the permit as requirements, where appropriate. Extensive information on the development of a monitoring and modeling plan is contained in the *Combined Sewer Overflows—Guidance for Monitoring and Modeling* (EPA, 1995d).

The monitoring and modeling plan should balance the costs of monitoring and modeling against the information needed to characterize the combined sewer system (CSS), combined sewer overflows (CSOs), and the receiving water and to develop, implement, and verify the effectiveness of CSO controls. Since monitoring data and modeling results are important factors in making CSO control decisions, it is crucial that collected monitoring data accurately represent the conditions that exist throughout the CSS, CSOs, and the receiving water. Monitoring data are used as modeling inputs and for model calibration and verification, so accurate, representative monitoring data are also necessary if the permittee intends to perform modeling to assist in the selection of the most appropriate CSO controls. In some cases, a permittee may have a considerable amount of existing data from previous monitoring efforts and may only need to perform a limited amount of additional monitoring. The permit writer should remember these

Exhibit B-1. Outline of Major Monitoring Plan Elements

A. Identification of Monitoring and Modeling Goals and Objectives

1. Define the CSS's hydraulic response to rainfall
2. Determine CSO flows and pollutant concentrations/loadings
3. Evaluate the impacts of CSOs on receiving water quality
4. Provide data to support modeling
5. Support the review and revision (as appropriate) of water quality standards
6. Support implementation and documentation of the nine minimum controls (NMC)
7. Evaluate the effectiveness of the NMC
8. Evaluate and select CSO control alternatives through long-term control plan (LTCP) implementation
9. Evaluate the effectiveness of LTCP implementation
10. Achieve site-specific objectives

B. Review of Existing Data and Information

1. Summary of existing data and information
2. Determination of how existing data address goals and objectives
3. Identification of data needs

C. Development of Sampling Program to Address Data Needs

1. Duration of monitoring and modeling plan
2. Monitoring locations
3. Frequency of sampling and/or number of precipitation events to be sampled
4. Criteria for when the samples will be taken (e.g., greater than x days between precipitation events)
5. Sampling protocols (e.g., type of samples, chain of custody)
6. Analytical methodologies and detection limits
7. Flow measurement protocols
8. Pollutants or parameters to be analyzed and/or recorded
9. Sampling and safety equipment and personnel
10. Quality Assurance/Quality Control (QA/QC) procedures for sampling and analysis

D. Discussion of Methods for Data Management and Analysis

1. Data management
2. Statistical methods for data analysis
3. Modeling strategy, including model(s) selected
4. Use of data to support NMC implementation and LTCP development

E. Implementation Plan

1. Recordkeeping and reporting
2. Personnel responsible for implementation
3. Scheduling
4. Resources (funding, personnel, and equipment)
5. Health and safety issues

factors when reviewing any proposed monitoring and modeling plan. Although the permit writer should provide flexibility to allow for scheduling and budget constraints, he or she should not accept an inadequate monitoring and modeling plan.

A review team that has members knowledgeable in developing and implementing monitoring programs should be convened to review a proposed monitoring and modeling plan. If the proposed monitoring and modeling plan does not meet the established goals, the permit writer should raise these issues and work with the permittee to develop a monitoring and modeling plan that meets the established objectives. In addition, in some instances, the permit writer and/or the permittee may need to establish priorities to perform the most critical data collection first and schedule additional monitoring activities within a reasonable time period.

When reviewing a monitoring and modeling plan and developing monitoring requirements in the permit, the permit writer should consider sampling locations, pollutants to be monitored, frequencies, duration including periods of rainfall or other seasonal issues, sample types, and analytical methods, among other appropriate factors as listed in Exhibit B-1. These factors are described in the following discussion using examples. The specific sampling details are important because the permit writer may want to incorporate them into the permit:

- **Sampling Location**—Generally, the permittee will need to collect rainfall data, flow data, and pollutant data to define the CSS's hydraulic response to rainfall and determine CSO flows and pollutant loadings.

  - If sufficient existing rainfall data are not available, the permittee may need to install rain gages to collect the data. Rain gages should be located so that they provide data that are representative of the entire CSS drainage area.

  - To assess flow patterns and volume in the CSS, the permittee may need to select some sampling locations along various trunk lines of the collection system if flow data from existing monitors and at hydraulic controls (e.g., pump stations) are not sufficient. The permittee should also sample the portions of the collection system that are likely to receive significant pollutant loadings (e.g., areas where significant industrial users are located) to obtain flow and loading data.

- When monitoring CSOs, if it is not feasible to monitor all CSOs, a defined percentage of the total outfalls in the system should be sampled. The specific number of outfalls to be monitored should be based on the size of the collection system, the total number of overflow locations, the number of different receiving water bodies, and potential and known impacts. If only selected locations are sampled, they should represent the system as a whole or represent the worst-case scenario. For example, if all CSOs are not monitored, selected locations could be chosen that represent overflows that occur most frequently, have the largest pollutant loading or flow volume, or discharge to sensitive areas.

- For receiving water monitoring, the selection of appropriate locations depends on the characteristics of the receiving water (e.g., size of the water body, horizontal and vertical variability), the pollutants of concern, and the location of sensitive areas.

- **Pollutants**—CSSs need to be monitored for pollutants of concern, including pollutants with water quality criteria for the specific designated use(s) of the receiving water and pollutants key to the attainment of the designated use(s). The pollutants or classes of pollutants recommended for monitoring in most cases include biochemical oxygen demand or dissolved oxygen, total suspended solids, settleable solids, nutrients, toxic pollutants reasonably expected to be present, and bacteriological indicators. In some cases, specific pollutants should be measured; in other cases, surrogates of a pollutant class may be used. For example, heavy metals may be addressed by only monitoring copper, lead, and zinc because these are the metals most commonly found in CSOs. If water quality standards for mercury and arsenic are being exceeded, however, then they should be monitored. The selection of pollutants to be monitored should also be based on the characteristics of the nondomestic discharges to the collection system or watershed. Receiving water monitoring may include biological assessment and sediment monitoring in addition to the pollutants listed above.

- **Frequency of Monitoring**—Frequency of monitoring should reflect the type and amount of data needed to achieve the program goals. Monitoring programs may include:

  - Sampling a certain size precipitation event (e.g., 3-month, 24-hour storm)
  - Sampling all precipitation events that result in overflows
  - Sampling a certain number of precipitation events (i.e., monitor until five storms are collected of a certain minimum size)

  The precipitation events to be sampled should be separated by an adequate duration so that a sample of worst-case conditions is collected. The National Pollutant Discharge Elimination System (NPDES) Storm Water Program uses the criterion that the duration between the beginning of the precipitation event sampled and the end of the previous measurable precipitation event be at least 72 hours.

An assessment of the monitoring frequency should include consideration of the following criteria:

- **Relative risk of CSO impacts**. If facilities discharge to sensitive areas or high quality waters, more frequent monitoring may be warranted. For example, the monitoring frequency should increase in an area where human contact occurs through swimming, boating, and other recreational activities.
- **Variability of discharge**. CSOs with variable flows should be monitored more frequently than CSOs with relatively consistent flows.

For receiving water characterization, the monitoring plan should target seasons, flow regimes, and other critical environmental conditions.

- **Duration of Monitoring Program**—The duration of the monitoring program is generally based on sampling a number of storm events adequate to provide the data needed to either calibrate and validate the CSS hydraulic model, or to provide sufficient data to evaluate CSO control alternatives where a model is not used. During that period (which generally may be a season or several months), storms of varying intensity, antecedent dry days, and total volume should be monitored to represent the range of conditions experienced by the CSS. The duration should be sufficient to sample enough storm events to readily estimate means and variations of pollutant concentrations in CSOs. The sampling period for flow and occurrence monitoring may extend for the duration of the permit; the sampling period for instream monitoring or other special studies may be relatively short. When feasible, permit writers should coordinate monitoring requirements if the data will be used for the same purpose (e.g., calculation of a wasteload allocation).

- **Sample Type**—The sample type may be composite or grab, depending on site-specific conditions and the intended use of the data. To determine average loadings of pollutants to the receiving stream, it may be most appropriate to collect flow-weighted composites. Because CSOs may be intermittent and the volume dependent upon precipitation events, however, it may not be appropriate to collect 24-hour composite samples, which are used for continuous nondomestic and municipal wastewater discharges. Instead it may be more appropriate to collect a composite over the duration of the entire discharge. It is critical that the permittee use sample types that will adequately characterize CSOs. However, the permit writer should be aware that the composite samples are more resource intensive than grab samples. Grab samples may be appropriate if only approximate levels of pollutants are needed or if the most important concern is the impact of worst-case conditions (i.e., first 15 or 30 minutes of overflow). In addition, grab samples should be collected for pollutant parameters not amendable to compositing (e.g., pH, bacteria).

- **Analytical Methods**—Analytical methods should be selected pursuant to 40 CFR Part 136, which references one or more of the following:

  - Test methods in Appendix A to 40 CFR Part 136 (i.e., *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*).
  - *Standard Methods for the Analysis of Water and Wastewater* (most current EPA-approved edition)
  - *Methods for the Chemical Analysis of Water and Wastes*

  The analytical methods contained in Part 136 are test methods designed only for specified pollutants or parameters. For other parameters, it may be necessary for the permit writer to specify the analytical methods required on a case-by-case basis. For example, Part 136 does not contain biomonitoring test procedures; therefore, the permit writer will need to specify the methods. EPA has published recommended biomonitoring test protocols.

In reviewing these elements of the monitoring and modeling plan, as well as the other elements listed in Exhibit B-1, the permit writer should consider the amount of existing data the permittee has collected. A permittee with a substantial set of existing data may not need to conduct additional monitoring for all the conditions addressed above

The permit writer should also determine whether models or data analysis methodologies specified in the monitoring and modeling plan are appropriate for the CSS and the type of data being collected. If the monitoring and modeling objectives include informational needs, modeling, or statistical, graphical, or other data analyses, techniques should be specified so reliable and consistent information is obtained. This will ensure that data collection efforts meet the needs of the analytical methods. Review by the appropriate members of the review team (i.e., statisticians or other experts in monitoring and modeling plan development and implementation) will ensure that the proposed data collection and analytical methodologies will meet the stated objectives of the monitoring and modeling plan.

Each plan will need to be evaluated on a case-by-case basis. The permit writer may enlist the EPA permitting and/or monitoring staff in reviewing the monitoring and modeling plans submitted by the permittee. If the review team determines that the proposed plan is

inadequate, then the permit writer should work with the permittee to address deficiencies in the plan.

APPENDIX C

The permit writer may find this checklist useful in reviewing NMC documentation submitted by the permittee. However, because some items listed in the checklist may not be applicable to the permittee, there may not be a "yes" answer to every question.

Suggested Nine Minimum Controls Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Proper Operation and Regular Maintenance Programs for the CSS and CSO Outfalls				
Does the O&M program describe the system, including an inventory of all CSO structures, equipment, and treatment facilities?				
Does the O&M program provide procedures for keeping this inventory current?				
Will the O&M program be effective in reducing the number, frequency, and pollutant loadings of CSOs?				
Does the O&M program: Include routine inspection, cleaning and maintenance, and repair schedules for all inventoried CSO outfalls, interceptors, regulators, pumping stations, and equipment including schedules and inspection frequencies that are appropriate for the system?				
Include inspections for dry weather overflows and illicit connections?				
Provide operating procedures and specifications for all equipment, structures, facilities, CSO outfalls, and off-line storage structures, including the hydraulic capacities of the collection and treatment systems, the storage capacities of the collection and treatment systems, and off-line storage capacity?				
Have in place operating procedures that reflect the best use of the system's flow and routing controls to minimize CSOs, including procedures to identify and correct CSS and CSO problems?				
Require logs or other documentation of completed activities and documentation of sewage blockages?				
Address the location of overflows where O&M is hindered (e.g., structures are under major thoroughfares, railroad yards, or other difficult-to-reach or safety hazard areas)?				

Suggested Nine Minimum Controls Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Allocate resources for O&M program implementation, including staffing level and funding, equipment, and training?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	
Maximum Use of the Collection System for Storage				
Has the permittee: Identified portions of the CSS usable for storage and determined the CSS storage capacity, including configuration, size, and pump station capacity?				
Identified appropriate minor modifications to increase storage (e.g., raising existing weirs)?				
Identified potential off-line storage at existing facilities?				
Implemented procedures for maximizing CSS storage capacity?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Nine Minimum Controls Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Review and Modification of Pretreatment Programs				
Has the permittee: Determined whether the CSS receives nondomestic wastewater discharges?				
Prepared an inventory of nondomestic users who discharge to the CSS and evaluated the discharge constituents and suspected impacts from such users?				
Evaluated the potential for regulating either the volume or pollutant loadings from nondomestic users to the CSS during wet weather flow conditions?				
Modified the pretreatment program as determined appropriate?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Nine Minimum Controls Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Maximization of Flow to POTW Treatment Plant				
Has the permittee: Compared existing flow conditions to the design capacity of the collection system?				
Identified actions that could be taken to increase flows to the POTW treatment plant during wet weather flow conditions without significantly affecting treatment performance?				
Conducted plant tests to determine the plant capability to treat higher flows during wet weather flow conditions or determined, using available historical data, the maximum flow that can be treated?				
Developed, implemented, and documented implementation of a flow maximization plan during wet weather flow conditions?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Nine Minimum Controls Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Prohibition of CSOs During Dry Weather Flow Conditions				
Has the permittee: Developed adequate procedures to document where and when dry weather overflows occur, including follow-up inspections after dry weather overflows occur?				
Developed and instituted procedures to prevent and eliminate dry weather overflows, including routine inspection of regulators and CSO outfalls as part of the O&M plan?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Nine Minimum Controls Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Control of Solid and Floatable Materials in CSOs				
Has the permittee: Evaluated the following technologies for the control of solid and floatable materials in CSOs:				
Screening materials using baffles, screens, and netting?				
Skimmer boats?				
Skimming from water body surface with booms at outfalls in confined areas?				
Source control, which may be addressed under the pollution prevention program for CSO outfalls?				
Identified and addressed problems that may be created by the installation of the control technology?				
Implemented the appropriate control technology, considered and provided justification that the technology is appropriate for the site conditions, and is conducting associated inspections and regular maintenance?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Nine Minimum Controls Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Pollution Prevention Program				
Has the permittee: Evaluated source control measures both at the government level (e.g., street cleaning; banning or substitution of products, such as plastic food containers; controlled use of pesticides, fertilizers, and other hazardous substances at public facilities) and among the public (e.g., used oil recycling, household hazardous waste collection)?				
Included a wide-reaching public education program?				
Evaluated mechanisms to encourage water conservation (e.g., public outreach, structuring of water/sewer service charges, local ordinance provisions)?				
Allocated adequate resources to conduct pollution prevention program activities?				
Implemented and maintained detailed records of pollution prevention activities?				
Promoted the use of industrial/construction BMPs for storm water?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Nine Minimum Controls Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Public Notification				
Has the permittee: Evaluated options for public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts?				
Implemented notification procedures regarding the presence of contaminants at critical levels in the receiving water bodies due to CSOs?				
Implemented procedures that notify persons reasonably expected to be affected by the CSO?				
Documented CSO occurrences and associated notifications?				
Installed identification signs at each CSO outfall?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

APPENDIX D

The permit writer may find this checklist useful in reviewing the long-term control plan submitted by the permittee. However, because some items listed in the checklist may not be applicable to the permittee, there may not be a "yes" answer to every question.

Suggested Long-Term Control Plan Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Public Participation				
Does the public participation process seek to actively involve rate payers, industrial users of the CSS, persons near the impacted waters, and persons who use the impacted waters?				
Does the public participation plan document how the public was notified of public participation events?				
Does the public participation plan include a record of the public participation events, including the number of people attending and a record or summary of comments?				
Does the public participation plan contain a summary of comments and the changes or decisions made in response to public comments?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Long-Term Control Plan Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
CSS Characterization, Monitoring, and Modeling				
Is there a general description of the CSS that includes the geographical area and population served?				
Is there a map of the CSS depicting the location of all CSO outfalls and receiving water bodies?				
Have sensitive areas and all outfalls located in these areas been identified?				
Is there description of how the CSS responds hydraulically to rainfall events and is it adequate to determine which rainfall events trigger CSOs?				
Is there information on the volume, flow rate, and frequency of CSOs and the pollutants discharged?				
Is there information on the CSO pollutant loadings and their impact on receiving waters?				
Has all available information on pollutant loadings from other point and nonpoint sources in the watershed and their impacts on receiving waters been identified and compiled?				
Is there information on designated water uses and whether designated uses are being met?				
Does the CSS and CSO characterization provide information on the known effects of the CSOs on water quality during precipitation events, as well as provide the level of detail needed to model or project both the operation of the system and the impacts of various overflow scenarios on the receiving waters?				
Is monitoring sufficient to document baseline conditions to allow the permittee to demonstrate the long-term benefits of CSO controls?				
Has the monitoring been coordinated with any ongoing or planned State programs and programs of other permittees within the same watershed?				
If modeling was conducted, is the model identified and described and are the results provided?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Long-Term Control Plan Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
CSO Control Alternatives				
Did the permittee develop a comprehensive list of CSO control alternatives?				
Did this list include alternatives from each of the four general categories—source controls, collection system controls, storage, and treatment technologies (described in *Combined Sewer Overflows—Guidance for Long-Term Control Plan* [EPA, 1995a])?				
Are the CSO control alternatives that were considered described?				
Does the plan describe the process by which the CSO control alternatives were developed?				
Does this plan compare the environmental benefits of the CSO control alternatives?				
Is cost/performance information (including curves) for each of the CSO control alternatives provided?				
Do the cost/performance analyses evaluate a range of levels of controls that were developed based on the permittee's site specific conditions (e.g., zero overflow events per year, and averages of 1 to 3, 4 to 7, and 8 to 12 overflow events per year)?				
Does plan describe the approach used to screen the list of CSO control alternatives, including the recommended screening criteria?				
Do the screening criteria include performance factors, implementation and operation factors, such as costs, and environmental impacts (described in *Combined Sewer Overflows—Guidance for Long-Term Control Plan* [EPA, 1995a])?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Long-Term Control Plan Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Selected CSO Controls				
Is the presumption or demonstration approach used?				
Does the plan identify the reasons for selecting certain CSO controls?				
Were reasons for rejecting specific CSO controls reasonable?				
Have the NMC been integrated into the permittee's description of its selected CSO controls?				
Will the selected CSO controls eliminate all CSO points to sensitive areas?				
If not, do the data support the permittee's conclusion that elimination is not physically possible or economically achievable?				
If CSO outfalls to sensitive areas remain: Will these CSOs receive treatment?				
Will the CSO controls be sufficient to provide for the attainment of WQS?				
Have control efforts for other point and nonpoint sources of pollutants within the watershed been considered?				
Will the CSO controls provide treatment or removal of floatables and settleable solids equivalent to that achieved by primary clarification?				
Is the mechanism for solids and floatables disposal described?				
Will the disinfection of effluent be necessary based on applicable WQS?				
If yes, is disinfection proposed as part of the CSO controls?				
If yes, will removal of harmful disinfection chemical residuals be necessary?				
If no, does the information support the conclusion that disinfection is not necessary?				

Suggested Long-Term Control Plan Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Do the selected CSO controls provide the maximum pollution reduction benefits reasonably attainable?				
Will the selected CSO controls provide for the attainment of WQS?				
If WQS cannot be met because of sources other than CSOs, has the permittee provided information on the other sources and natural background conditions?				
Are the selected CSO controls designed to allow cost-effective expansion or cost-effective retrofitting if additional controls are determined necessary to provide for the attainment of WQS?				
Has a TMDL been developed for the watershed?				
If so, has the permittee considered the TMDL in developing its LTCP?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Long-Term Control Plan Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Implementation Schedule				
Do any phased construction schedules consider: Eliminating CSOs to sensitive areas?				
Use Impairment?				
Do any phased construction schedules include an analysis of financial capability?				
Did the permittee evaluate the following factors: Median household income?				
Total annual wastewater and CSO control costs per household as a percent of median household income?				
Overall net debt as a percent of full market property value?				
Property tax revenues as a percent of full market property value?				
Property tax collection rate?				
Unemployment?				
Bond rating?				
Did the permittee evaluate the following factors: Grant and loan availability?				
Previous and current residential, commercial, and industrial sewer user fees and rate structures?				
Other viable funding mechanisms and sources of financing?				
Does the schedule include milestones for all major implementation activities, including environmental reviews, siting of facilities, site acquisition, Army Corps of Engineers permitting, etc.?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

Suggested Long-Term Control Plan Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Post-Construction Compliance Monitoring				
Does the monitoring program include monitoring of CSOs that are representative of the impacts to receiving waters?				
Does the monitoring program include ambient receiving water body monitoring at representative CSOs, as well as monitoring prior to CSO impacts?				
Has the receiving water body monitoring program been coordinated with any ongoing or planned State programs and programs of other permittees within the same watershed?				
Does the monitoring program include any biological parameters (e.g., fish, zooplankton)?				
Does the monitoring program address pollutants included in the water quality criteria for the specific designated uses(s) of the receiving water, pollutants key to the attainment of the designated water use(s), and pollutants affected by the CSO controls?				

Suggested Long-Term Control Plan Evaluation Checklist

Evaluation Criteria	Yes	No	N/A	Remarks
Does the monitoring program include appropriate measures of success?				
Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	
Comprehensive Evaluation Result (circle one)	**Adequate**	**Inadequate**	**Other**	

GLOSSARY[1]

Average Number of Overflow Events Per Year—The total number of combined sewer overflow events that occurred during the term of the permit divided by the permit term in years.

Combined Sewer Overflow—The discharge from a combined sewer system to a receiving water of the United States prior to reaching the publicly owned treatment works treatment plant.

Combined Sewer Overflow Event—The discharges from any number of points in the combined sewer system resulting from a single wet weather event that do not receive minimum treatment (i.e., primary clarification, solids disposal, and disinfection, where appropriate). For example, if a storm occurs that results in untreated overflows from 50 different CSO outfalls within the CSS, this is considered *one* overflow event.

Combined Sewer System—A wastewater collection system owned by a State or one or more municipalities (as defined by Section 502(4) of the Clean Water Act) which conveys sanitary wastewaters (domestic, commercial, and industrial wastewaters) and storm water through a single-pipe system to a publicly owned treatment works treatment plant (as defined in 40 CFR 403.3(p)).

Dry Weather Flow Conditions—Hydraulic flow conditions within the combined sewer system resulting from one or more of the following: flows of domestic sewage, ground water infiltration, commercial and industrial wastewaters, and any other non-precipitation event related flows (e.g., tidal infiltration under certain circumstances). Other non-precipitation event related flows that are included in dry weather flow conditions will be decided by the permit writer based on site-specific conditions.

Dry Weather Overflow—A combined sewer overflow that occurs during dry weather flow conditions.

Precipitation Event—An occurrence of rain, snow, sleet, hail, or other form of precipitation. Precipitation events are generally characterized by parameters of duration and intensity (inches or millimeters per unit of time). This definition will be highly site-specific. For example, a precipitation event could be defined as 0.25 inches or more of precipitation in the form of rain or 3 inches or more of precipitation in the form of sleet or snow, reported during the preceding 24-hour period at a specific gaging station. A precipitation event could also be defined by a minimum time interval between measurable amounts of precipitation (e.g., 6 hours between the end of rainfall and the beginning of the next rainfall).

Primary Clarification or Equivalent—The level of treatment that would typically be provided by one or more treatment technologies under peak wet weather flow conditions. Options for

[1]These definitions were developed solely for the purposes of this guidance document.

defining primary clarification include a design standard (e.g., side wall depth and maximum overflow rate), a performance standard (e.g., percent removal), or an effluent standard (e.g., concentration of pollutants). "Equivalent to primary clarification" is site-specific and includes any single technology or combination of technologies shown by the permittee to achieve primary clarification under the presumption approach. The permittee is responsible for showing equivalency to primary treatment as part of the evaluation of CSO control alternatives during LTCP development. Primary clarification is discussed in more detail in the *Combined Sewer Overflows-Guidance for Long-Term Control Plan* (EPA, 1995a).

Sensitive Areas—Areas of particular environmental significance or sensitivity that could be adversely affected by a combined sewer overflow, including Outstanding National Resource Waters, National Marine Sanctuaries, water with threatened or endangered species, waters with primary contact recreation, public drinking water intakes, shellfish beds, and other areas identified by the permittee or National Pollutant Discharge Elimination System permitting authority, in coordination with the appropriate State or Federal agencies.

Solid and Floatable Materials—Solid or semi-solid materials should be defined on a case-by-case basis determined by the control technologies proposed by the permittee to control these materials. The term generally includes materials that might impair the aesthetics of the receiving water body.

Wet Weather Flow Conditions—Hydraulic flow conditions within the combined sewer system resulting from a precipitation event. Since the definition of precipitation event is site-specific, the permit writer should evaluate and define certain site-specific weather conditions that typically contribute to wet weather flow. EPA encourages permit writers to include snowmelt as a condition that typically contributes to wet weather flow.

REFERENCES

U.S. Environmental Protection Agency (EPA). 1995a. *Combined Sewer Overflows—Guidance for Long-Term Control Plan* (EPA 832-B-95-002).

EPA. 1995b. *Combined Sewer Overflows—Guidance for Nine Minimum Controls* (EPA 832-B-95-003).

EPA. 1995c. *Combined Sewer Overflows—Guidance for Screening and Ranking* (EPA 832-B-95-004).

EPA. 1995d. *Combined Sewer Overflows—Guidance for Monitoring and Modeling* (EPA 832-B-95-005).

EPA. 1995e. *Combined Sewer Overflows—Guidance for Financial Capability Assessment* (EPA 832-B-95-006).

EPA. 1995f. *Combined Sewer Overflows—Guidance for Funding Options* (EPA 832-B-95-007).

EPA. 1995g. *Combined Sewer Overflows—Guidance for Permit Writers* (EPA 832-B-95-008).

EPA. 1995h. *Combined Sewer Overflows—Questions and Answers on Water Quality Standards and the CSO Program* (EPA 832-B-95-009).

EPA. 1993. *Training Manual for NPDES Permit Writers*. (EPA 833-B-93-003).

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control*. (EPA/505/2-90-001), PB91-127415.