

CHAPTER 2 CMOM

As has been stated and described earlier, EPA has been working for a number of years on regulatory changes to enhance the performance of sanitary sewer collection systems with the intent of reducing sanitary sewer overflows and preserving the substantial investment in infrastructure that collection systems represent.

The information contained in this chapter was gathered directly from the January 4, 2001 draft Notice of Proposed Rulemaking for EPA's Sanitary Sewer Overflow Rule, which was placed on EPA's website but withdrawn prior to its publication in the Federal Register. As such, the information contained below is the most current representation of EPA's vision of best practices for optimizing sanitary sewer collection system performance.

Once EPA's Sanitary Sewer Overflow rule enters the rulemaking process and moves to promulgation, EPA is likely to establish NPDES permit conditions requiring capacity assurance, management, operations and maintenance (CMOM) programs be developed, implemented and periodically reviewed.

Sanitary sewer collection system owners and operators seeking to optimize the performance of their system are encouraged to become familiar with the performance standards, components measures and activities described in this chapter and reflect upon current activities in their own system, which could be enhanced or improved.

2.1 Current Regulations for Collection System Operation and Maintenance

It is worth noting that Federal requirements for operation and maintenance of collection systems are not new and presently exist within NPDES regulations. Under existing federal regulations at 40 CFR 122.41, all NPDES permits must contain two standard conditions addressing operation and maintenance.

- A. Proper Operation and Maintenance Requirements at 40 CFR 122.41(e) requires proper operation and maintenance of permitted wastewater systems and related facilities to achieve compliance with permit conditions.
- B. Duty to Mitigate at 40 CFR 122.41(d) requires the permittee to take all reasonable steps to minimize or prevent any discharge in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment.

Inadequate collection system operation and maintenance practices, particularly those that lead to SSOs, would violate these permit conditions.

In addition, the Clean Water Act Construction Grants Program established provisions requiring grantees that received EPA funding to assure proper and efficient operation and maintenance of treatment works and their associated collection systems. These provisions require the development of operation and maintenance manuals, emergency operating programs, personnel training, adequate budget, and operational reports.

2.2 CMOM Concept and What It Might Entail

The proposed CMOM approach outlines a dynamic system management framework that encourages evaluating and prioritizing efforts to identify and correct performance-limiting situations in the collection system. Industry technical guidance supports the need for dynamic approaches that use information about system performance, changing conditions, and operation and maintenance practices to guide and modify responses, routine activities, procedures, and capital investments.

The CMOM program was developed in an attempt to establish a process and framework that would allow collection system owners and operators to:

1. Understand the components that make up the collection system and how the collection system performs.
2. Identify goals and objectives for managing a specific collection system.
3. Provide the necessary program structure to allow goals to be met; including ensuring appropriate program components are in place, organization of administrative and maintenance functions, legal authorities, measures and activities, and design and performance standards.
4. Strive for adjustment of implementation activities to reflect changing conditions; including monitoring and measuring program implementation and making appropriate modifications, conducting necessary system evaluations, implementing a capacity assurance program, and conducting periodic program audits to evaluate implementation and to identify deficiencies and steps to respond to them.
5. Prepare for and respond to emergency events.
6. Communicate with interested parties on the implementation and performance of the CMOM program.

2.2.1 General Performance Standards

As first conceptualized in the 2001 draft proposal, EPA's CMOM standard permit condition for municipal sanitary sewer collection systems would contain five general performance standards.

The permittee would need to:

1. Properly manage, operate and maintain, at all times, the parts of the collection system that the permittee owns or over which it has operational control.
2. Provide adequate capacity to convey base flows and peak flows.
3. Take all feasible steps to stop, and mitigate the impact of, sanitary sewer overflows.
4. Provide notification to parties with a reasonable potential for exposure to pollutants associated with the overflow event.
5. Develop a written summary of their CMOM program and make it, and required program audits, available to the public upon request.

2.2.2 CMOM Program Components

EPA's proposed CMOM program identifies six components EPA believes are generally necessary to meet the five performance standards in the proposed standard condition. The CMOM program would need to:

1. Identify program goals consistent with the general standards.
2. Identify administrative and maintenance functions responsible for implementing the CMOM program and chain of communication for complying with reporting requirements for SSOs.
3. Include legal authorities necessary for implementing the CMOM program.
4. Address appropriate measures and activities necessary to meet the performance standards.
5. Provide design and performance provisions.
6. Monitor program implementation and measure its effectiveness.

1. Program Goals

Program goals help determine the course of action needed to set a CMOM program in motion. Goals define the purpose and desired results of the CMOM program. Goals may reflect performance, safety, customer service, resource use, compliance, and other considerations.

2. Administrative and Maintenance Functions

Responsibilities for managing and implementing CMOM program activities need to be clearly defined, documented, and communicated. Job descriptions help ensure that all employees know specific responsibilities and individuals have proper credentials. Determination of staff requirements for a collection system requires a working knowledge of the system and consideration of key variables.

3. Legal Authorities

In order to implement an effective CMOM program, the permittee would need to have sufficient legal authority to authorize implementation activities. The proposed CMOM provision identifies five classes of activities that EPA generally believes are necessary for implementing a CMOM program:

- A. Control of infiltration and connections from inflow sources.
- B. Requirement that sewers and connections be properly designed and constructed.
- C. Ensure proper installation, testing, and inspection of new and rehabilitated sewers.
- D. Address flows from municipal satellite collection systems (to the extent the permittee services such systems).
- E. Implement the general and specific prohibitions of the national pretreatment program (see 40 CFR 403.5).

4. Measures and Activities

Measures, activities and program requirements would need to be tailored to the size, complexity and specific features of the collection system. The proposed CMOM provision specifically identifies eight general classes of measures and activities (discussed in

Section 2.2.3, below) that EPA believes are generally appropriate and applicable for most municipal sanitary sewer collection system programs.

5. Design and Performance Provisions

An effective program that ensures that new sewers (including building laterals/connections) are properly designed and installed can help avoid permanent system deficiencies that could create or contribute to future overflow events and/or operation and maintenance problems. Similarly, major rehabilitation and repair projects are opportunities to ensure that work is done correctly in a way that will minimize future problems. The proposed CMOM provision would require permittees to develop and implement programs to ensure:

- Requirements and standards are in place for the installation of new collection system components and for major rehabilitation projects.
- Procedures and specifications exist for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects that are implemented.

6. Monitoring, Measurement, and Program Modifications

Accurate sewer performance information is an important part of improving collection system performance and is a core task of any asset management program. EPA's proposed CMOM provision would require permittees to monitor the implementation and, where appropriate, measure the effectiveness of elements of their CMOM programs. Satisfaction of this requirement typically would include identifying performance indicators to describe and track the implementation of various aspects of their CMOM programs. Performance indicators are ways to quantify and document the results and effectiveness of control efforts. Performance indicators also can be used to measure and report progress towards achieving goals and objectives and to guide management activities.

2.2.3 Measures and Activities

As described above, the fourth component of a CMOM program—Measures and Activities—identifies eight general areas of operation and maintenance that EPA believes are generally appropriate and applicable for most municipal sanitary sewer collection system programs. The eight general measures and activities, which EPA proposed in 2001, are described below.

A. Maintenance Facilities and Equipment

Permittees would need to provide adequate maintenance facilities and equipment. Maintenance facilities are locations where equipment, materials and personnel are dispatched and where operations records are kept. Increasingly, computer systems are used to manage maintenance records. Industry guidance recognizes that a properly planned and supported equipment yard is essential to collection system operation.

B. Maintenance of a Collection System Map

One of the most typical problems in collection system management and maintenance is determining the locations of sewer lines and manholes. Determining such locations is best done by keeping appropriate collection system maps up-to-date. Many agencies keep large

paper maps divided into overlapping, large-scale sections that can be bound into books that can be stored easily and taken into the field as needed. Maps and plans should be kept current by updating them when alterations or system additions occur.

C. Use of Timely, Relevant Information

Timely, relevant information plays a critical role in an effective CMOM program. A dynamic CMOM program focuses on planning, implementing, reviewing, evaluating and taking appropriate actions in response to available information. The key to these approaches is the ability to get information from staff in the field to managers. The use of timely, relevant information does not require that a computer or electronic database be used. A paper copy system to track information and data may be adequate. Regardless of the method for managing information, operators should have a written description of the procedures used, including procedures for operating and updating the system. If the system is computer-based, procedures should present any unique hardware and software requirements.

D. Routine Preventive Operation and Maintenance Activities

A good preventive maintenance program is one of the best ways to keep a system in good working order and prevent service interruptions and system failures which can result in overflows and/or backups. In addition to preventing service interruptions and system failures, a preventive maintenance program can protect the capital investment in the collection system.

Preventive maintenance activities should ensure that the permittee:

- Routinely inspects the collection system, including pump stations, and addresses defects or other problems.
- Investigates complaints and promptly corrects faulty conditions.
- Provides maintenance records, an adequate workforce and appropriate equipment in working order.
- Maintains and updates a schedule of planned activities.

Preventive maintenance activities typically address:

- Planned, systematic, and scheduled inspections to determine current conditions and plan for maintenance and repairs.
- Planned, systematic, and scheduled cleaning and repairs of the system based on past history.
- Proper sealing and/or maintenance of manholes.
- Regular repair of deteriorating sewer lines.
- Remediation of poor construction.
- Inspection and maintenance of pump stations and other appurtenances.
- A program to ensure that new sewers and connections are properly designed, inspected and constructed and new connections of inflow sources are prohibited.
- A program to oversee lateral and private collection system installations that tie in to public wastewater collection systems.
- A program to eliminate existing illegal inflow sources and a strategy for informing and educating the public about such sources.

E. Program to Assess the Capacity of the Collection System and Treatment Facilities

A critical function of a collection system is to provide adequate capacity for wastewater flows. The capacity needs of a collection system change as the system ages, new connections are made, and existing connections change their water usage. Identifying reserve capacity, hydraulic deficiencies, and capacity needs is critical for effective asset management. The capacity assessment program should ensure procedures exist and are implemented for:

- Determining whether adequate capacity exists in downstream portions of the collection system and treatment facilities that will receive wastewater from new connections.
- Identifying existing capacity deficiencies in the collection system and at treatment facilities.

Capacity assurance also implies the need for a Master Plan, which is a study that documents the expansion of the collection system due to community growth and system improvements. System improvements can include rehabilitation and replacement of current pipes (and manholes) due to deterioration, as well as the need for greater conveyance capacity due to increased contribution to the system.

F. Identification and Prioritization of Capacity and Structural Deficiencies and Corresponding Rehabilitation Actions

Sanitary sewers are exposed to harsh internal and external environments. Structural condition assessment is a principle objective of any pipeline system inspection program and is important to cost-effective management of the collection system. The collection system agency should clearly identify the techniques used in the program, such as field inspections or closed-circuit television, identify areas of the collection system where various measures are employed, and describe criteria for identifying priorities for inspection and for correction. Efforts to rate the condition of system components can be used to help prioritize actions. Where rating systems are used for identifying the condition of individual components of the collection system, the rating system should be explained.

G. Training

Collection system employees are exposed to numerous challenging conditions, and adequate training, including safety training, is necessary for employees to meet these challenges. An organized training program is a necessity, regardless of agency size. Training programs should address safety procedures and include training (general operation and maintenance procedures) to ensure employees are adequately prepared to implement appropriate provisions of the CMOM program.

H. Equipment and Replacement Parts Inventories

Providing adequate maintenance facilities and equipment typically includes a process for identifying critical parts needed for system operation, and maintenance of an adequate inventory of replacement parts. Without an adequate inventory of replacement parts, the collection system may experience extended overflow events in the event of a breakdown or malfunction including extended service outages for customers. The process for identifying critical parts can be based on a review of equipment and manufacturer's recommendations, supplemented by the experience of the maintenance staff. The amount

and types of equipment and tools held by a utility depend on the size, age and condition of the system. The less corrective maintenance required and more scheduled preventive maintenance done, the fewer emergency supplies are required to be kept in stock.

2.3 More Information

Additional information pertaining to CMOM and future collection system regulations is available from the EPA Office of Wastewater Management. Information can be downloaded from their website at www.epa.gov/npdes.

EPA Region 4, which pioneered the CMOM approach, has developed a checklist for conducting evaluations of wastewater collection systems. The Region 4 checklist is included in the Appendix of this document.

CHAPTER 2 REFERENCES

Draft Notice of Proposed Rulemaking—NPDES Permit Requirements for Municipal Sanitary Sewer Collection Systems, Municipal Satellite Collection Systems, and Sanitary Sewer Overflows. U. S. Environmental Protection Agency. January 4, 2001.

Guide for Evaluating Capacity, Management, Operation, and Maintenance Programs for Sanitary Sewer Collection Systems (DRAFT). U. S. Environmental Protection Agency. 2000. EPA No. 300-B-00-014.

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