A CMOM Program? It Doesn’t Need To Be Scary
Ohio Water Environment Association
2016 Annual Conference
What is CMOM?

• CMOM =
  • Capacity Assurance
  • Management
  • Operations
  • Maintenance

• Evaluation of Business Practices related to wastewater collection systems
• Part of broader Sanitary Sewer Overflow Prevention Policy

CMOM is not a bad word!
US EPA Proposed SSO Prevention Policy

Main Elements

• Prohibition of all SSOs
• Record keeping and reporting of SSOs
• Public notification of potential exposure to SSOs
• Capacity, Management, Operations and Maintenance
Goals of CMOM

- Identify and abate causes of system failures
- Reduce health and environmental risks
- Reduce equipment and operational failures
- Extend the life of systems and equipment
- Establish long-term funding for R&R
What is CMOM Supposed to Achieve?

Sustainable, **utility specific**, management, operations, and maintenance practices that lead to **improved system performance** and **reduced SSOs** and building backups.

Scalable to size and complexity of system – same goals though
CMOM is not a new idea!

- Most utilities already have elements of a CMOM program in place
- NPDES permit requirement
  - “…properly operate and maintain Treatment Works…”
- Recognized as a catalyst for having excellent programs
Effective Utility Management (EUM)

10 Attributes of Effectively Managed Utilities
Brief History of CMOM
Where did CMOM come from?

- Evolved out of the effort to identify the major causes of SSOs – *provide guidance to utilities to reduce overflows*
- Guidance under the proposed SSO regulations
- Initially implemented by USEPA Region IV - MOM
- Not yet adopted as a rule at the federal level – but viewed by the regulators as a fair tool to evaluate performance
SSO Policy Development Timeline

• 1972 – Clean Water Act passed
• 1994 – EPA began process because of **inconsistent** enforcement across the country
• January 2001 – Draft notice of proposed rulemaking signed
  • Withdrawn that same month by the Bush administration
• EPA “encouraging” CMOM through NPDES permits, Consent Order / Decree / Judicial Order / Stipulation, and other enforcement mechanisms on a case-by-case basis
Inconsistencies in Requirements

• Variations in program definitions
• Reporting requirements
  • “all overflows” – “overflows that reach waters” – “have potential to reach waters”
• Trigger volume for “Reportable SSOs”
  • “all overflows” – “greater than 1,000 gallons”
• Prescriptive / Specific program requirements
City of Akron
Regional and Statewide Enforcement

- Region IV
- Region V
- Region III
- California
  - Sanitary Sewer Management Plan (Waste Discharge Requirements)
- Wisconsin
  - State Administrative Code
- North Carolina
  - Collection System Permit
- Arizona
  - Non-mandatory permit
## California - SSMP

**SSMP Elements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisterns</td>
<td>- Properly manage, operate, and maintain all parts of the collection system</td>
</tr>
<tr>
<td></td>
<td>- Provide capacity to convey base and peak flows</td>
</tr>
<tr>
<td></td>
<td>- Minimize the frequency and severity of SSOs</td>
</tr>
<tr>
<td></td>
<td>- Mitigate the impact of SSOs</td>
</tr>
<tr>
<td>Organization</td>
<td>- Identify agency staff responsible for the SSMP</td>
</tr>
<tr>
<td></td>
<td>- Identify roles, communications, responsibilities, and reporting</td>
</tr>
<tr>
<td>Legal Authority</td>
<td>- Control infiltration/effluent (T/V) from the collection system and laterals</td>
</tr>
<tr>
<td></td>
<td>- Require proper design and construction of storage and connections</td>
</tr>
<tr>
<td></td>
<td>- Require proper installation, testing, and inspection of storage</td>
</tr>
<tr>
<td></td>
<td>- Ability to impose source control requirements</td>
</tr>
<tr>
<td>Operation and Maintenance Program</td>
<td>- Maintain up-to-date maps</td>
</tr>
<tr>
<td></td>
<td>- Allocate adequate resources for system operation and maintenance</td>
</tr>
<tr>
<td></td>
<td>- Prioritize preventive maintenance activities</td>
</tr>
<tr>
<td></td>
<td>- Identify structural deficiencies and implement actions to address them</td>
</tr>
<tr>
<td></td>
<td>- Provide emergency equipment to minimize equipment downtime</td>
</tr>
<tr>
<td></td>
<td>- Provide training on a regular basis for staff</td>
</tr>
<tr>
<td>Design and Construction Standards</td>
<td>- Identify minimum design and construction standards and specifications</td>
</tr>
<tr>
<td></td>
<td>- Identify procedures and standards for inspecting and testing</td>
</tr>
<tr>
<td>Overflow Emergency Response Plan</td>
<td>- Provide SCW notification procedures</td>
</tr>
<tr>
<td></td>
<td>- Develop and implement a plan to respond to SCW</td>
</tr>
<tr>
<td></td>
<td>- Develop procedures to report and record SCW</td>
</tr>
<tr>
<td></td>
<td>- Develop procedures to prevent overflows from reaching surface waters, and to minimize or correct any adverse impact from SCW</td>
</tr>
<tr>
<td>FOG Control Program</td>
<td>- Develop a Fats, Oil and Grease (FOG) neutral plan if needed</td>
</tr>
<tr>
<td>System Evaluation and Capacity Assurance</td>
<td>- Establish a present to assess the current and future capacity requirements</td>
</tr>
<tr>
<td></td>
<td>- Implement a capital improvement plan to provide hydraulic capacity</td>
</tr>
<tr>
<td>Monitoring, Measurement, and Program Verification</td>
<td>- Measure the effectiveness of each SSMP element</td>
</tr>
<tr>
<td></td>
<td>- Monitor each SSMP element and make updates as necessary</td>
</tr>
<tr>
<td>SSMP Audit</td>
<td>- Conduct an annual audit, including deficiencies and steps to correct them</td>
</tr>
<tr>
<td>Communication Program</td>
<td>- Collection system agency shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP</td>
</tr>
</tbody>
</table>

---

**Typical Areas of Brown and Caldwell Services**

- SSMP report evaluation
- SSMP development
- Maintenance program development
- Financial impact analysis
- Revenue enhancements and rate studies
- Replacement funding analysis
-瓜熟蒂落 and water evaluation
- FOG program development
- Emergency response plan
- Capacity assurance
- Pump station maintenance
- Comprehensive asset management
- Pump station and collection system maintenance training
- Water planning
- Hydrology modeling
- GIS
- Audit management
- On-site management
- Regional office issues
- Flow monitoring

---

**What is a Sanitary Sewer Management Plan?**

SSMPs are the new state-mandated requirement for all California public collection system agencies. The goal for these plans is to reduce overflows and improve the overall maintenance and management of sewer systems and pump stations. The State has developed an aggressive schedule for each city and agency to complete and implement its SSMP.

Brown and Caldwell has an extensive team of experts who are available to assist you in meeting SSMP requirements.
City of Santa Barbara

- **2007** - Santa Barbara averaged about 37 SSO’s per year
- **2011** – Began to improve business processes and improve use of technology (CMMS, GIS, CCTV)
- **2012** - Entered into SSO Consent Decree with Channel Keepers
- Working consistently on improvements to revise SSMP and reduce overflows
Wisconsin Collection System Permit

- Owners of Collection Systems - By August 1, 2016
- Guidance Document
- Detailed Compliance Maintenance Annual Report
City of Green Bay

- 2013 – ACO – Region 5
- CMOM Plan developed to fit State requirements
North Carolina Collection System Permit

- Does not require CMOM
- However, has many of the same elements
- But also requires:
  - Easement maintenance
  - High priority sewer inspection – 6 months
  - Distribution of FOG educational material
Aquifer Protection Permit

CMOM Plan provides enforcement discretion in the event of SSOs
Ohio Environmental Protection Agency

• NPDES Permits
• Consent Orders
• 2004 – Draft permit for Satellite Collection Systems
• Director’s Final Findings and Orders
Logan County, Ohio

- Requirement of NPDES permit
- 10 miles of sewers / force mains
- 7,200 customers
- 29 pumping stations
- 13 employees
- 1 satellite community
City of Columbus

- Consent Order with State of Ohio EPA - 2002
- CMOM Elements spelled out in CO
- Satellite communities
Deficiencies included in the Audit Report

- Standard Operating Procedures (SOPs)
- Information Management Systems (IMS)
- Performance Measures / Key Performance Indicators (KPIs)
- Preventive Maintenance Program (PMP)
- Condition Assessment (CA)
- Equipment and Critical Replacement Parts Inventory
- Fats, Oils and Grease (FOG) Program
- Inadequate information to address Satellite
Columbus Satellite Communities

- Ohio EPA – Director’s Final Findings and Orders (DFFOs)
- Required a development of CMOM program, OERP Plan, Public Notification Plan and SSES
- SSES – to address
  - Potential SSOs
  - Contributions of I/I to Columbus
What’s the big deal?

National Enforcement Initiative: Keeping Raw Sewage and Contaminated Stormwater Out of Our Nation's Waters

Cumulative Progress Toward Addressing Large Sanitary Sewer Systems with Untreated Sewage Overflows

- **Universe = 1103 Systems**
- **Goal = address all 1103 systems by end of FY 2016**

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Systems excluding Initiatives</th>
<th>Systems Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Done from 1998-2012</td>
<td>780</td>
<td></td>
</tr>
<tr>
<td>FY2013</td>
<td>828</td>
<td></td>
</tr>
<tr>
<td>FY2014</td>
<td>883</td>
<td></td>
</tr>
<tr>
<td>FY2015</td>
<td>914</td>
<td></td>
</tr>
</tbody>
</table>

*This initiative focuses on large municipalities whose sanitary sewer systems produce > 10 million gallons per day (mgd) of wastewater.
*Addressed means the system has been assessed and, where appropriate, is subject to a civil judicial complaint, an enforceable federal or state enforcement order, or permit requirements that address the noncompliance.
*Initiated enforcement actions are defined as formal EPA or state civil judicial enforcement referrals requesting filing of a...*
What Can Be Done?
“The time to repair the roof is when the sun is shining”

John F. Kennedy

- Be proactive, be ahead of the regulators
  - Initiate CMOM / AM programs prior to being told how you will operate and maintain your system

- CMOM is an opportunity to:
  - Provide a high level of service
  - Meet federal, state and local regulations
  - Be cost competitive
  - Avoid “the big one”

- Dictate your destiny
  - Durham – by means of the permit and implementation activities
Typical Program Focus

- MOM
- SECAP

Overflow Reduction

Years

Y1

Y5

Future

Perpetual Program Implementation
Benefits of the CMOM approach

- Reduced liability - “Affirmative Defense” 3rd party lawsuits
- Move closer to regulatory compliance, state, regional, federal
- Information-based decision making vs. gut feeling
- Establishes a process for “Continuous Improvement”
- Defines “Level of Service”
CMOM Realities

- Denial
- Tolerance
- Acceptance and Compliance
- Continuous Improvement
- Sustainability

CMOM Implementation
Long Term Sustainable Process
Use Level of Service Selection to Balance Risk and Cost

Rate Payers

Utilities

- Excessive System Pressures
- SSOs
- Public Health/Environment
- Regulatory Enforcement
**Strategic Guideposts**

- **Vision**: Direction and description of the future
- **Mission**: Why we exist. What we do
- **Goals**: What we want to accomplish
- **Strategies**: Series of actions needed to accomplish goals. There are usually several strategies under one goal
- **Measures**: Track what you are achieving

---

City’s Values. **Utility’s Guiding Principles.**
CMOM: Taking Control of Your Collection System

CMOM PROGRAM ELEMENTS

- Sustainable System Performance
- Asset Management Principles
- Cost Effective Execution
- Coordination with CSO & MS4
- Regulatory Compliance
- Planning
General Process to Develop a CMOM Program
What is Required in a CMOM Plan?

• General Standards to reduce SSOs
• Summary of Management Program
• Overflow Emergency Response Plan
• System Evaluation and Capacity Assurance Plan (SECAP)
• CMOM Program Audits
• Communication Plan
Many Tools Developed by USEPA

- Guide for Evaluating CMOM Programs
- CMOM Self Assessment Checklist
- Case Studies (on web site)
- APWA Overflow Emergency Response Plan
CMOM General Standards

i. Proper management, operation and maintenance
ii. Provide adequate capacity
iii. Stop and mitigate SSOs
iv. Notify affected parties
v. Written summary of CMOM and periodic audits
Specific CMOM Elements

- SSO Response/Reporting
- Map of system
- Legal authority
- Proper management of information
- Routine preventive maintenance
- Assess system capacity
- Identify structural deficiencies
- Training
- Adequate resources
- Standard for design & installation
- Inspection standards
- Measure the effectiveness of each element
- System for updating the program elements
Effectiveness versus Efficiency

**Effectiveness** – “producing a result that is wanted”

**Efficiency** – “producing results without wasting materials, energy or time”

Tied together, but not the same.

USEPA cares most about the “effects” or “results”...but, you must “properly manage, operate and maintain”...
Program Documentation

**Summary of Management Program**

- Program Goals
- Organization Description
- Summary of Legal Authorities
- Summary of Design and Performance Provisions
- Summary of Measures and Activities
- Summary of Modifications to the Program
Program Documentation

Summary of Management Program

- Program Goals
- Organization Description
- Summary of Legal Authorities
- Summary of Design and Performance Provisions
- Summary of Measures and Activities
- Summary of Modifications to the Program

- What
- Who
- How
- Prove
- Improve
Business Practice Evaluation

Where We Are Now

GAP

Where We Want to BE

Resources

Action Plan

- One year
- Three years
- Ultimate
Conduct Readiness Review to identify areas for improvement

CMOM Program Summary → Readiness Review Process
• Records Review
• Staff Interviews
• Field Investigations

Gap Identification → Gap Closure Plans
“Quick Hit” Plans
Consensus Workshop

Near-Term Plans → Long-Term Plans → Implementation
Audit Report

Continuous review and improvement
Develop a plan, with timelines, for implementation

- Identify what is required to meet goal:
  - Activity – new or modification to existing
  - Resources – labor, equipment, $$$$”
  - Performance measures – how to track success
  - Owner – who is responsible for activity
“One Team” approach encourages cooperation, trust and respect with focus on the program goals

• Fosters collaboration
• Builds consensus
• Encourages “buy-in”
• Facilitates transfer of knowledge
• Improves communication
How do you know you are being successful?
Information Management

How do you prove your program is effective?

- Annual reporting
  - SSOs
  - CMOM Program adjustments
- Periodic Program Audits
- Key Performance Indicators / Bench Marks
  - Simple
  - Measurable
  - Accurate
  - Responsive
  - Targeted
- Data Collection Systems
  - Mapping
  - Computerized Maintenance Management Systems (CMMS)
The Value of Institutional Knowledge

• “Brain Drain”
Document, Document, Document ....
Reports, Dashboards, and Maps

• Doesn’t need to be elaborate, just effective
• Provide baseline information, defense and justification
• Don’t underestimate the power of maps - GIS
Sewer Pipe Condition Map
Trouble spots, maintenance history, complaint history
Management Dashboard Supports Informed Decisions
CMMS Optimizes the Business

Sewer System Management Plan

- Standard Business Processes
- Effective Best Practices and Procedures
- Essential Data, Maps, and Information
- Consistent Reporting for Management Insight
- Optimize Use of CarteGraph
- Reliable Schedule of Planned Sewer Maintenance
Standard Workflows Supported by Technology Helped Santa Barbara Achieve its Goals

- Improve Management and Operation of WW Collection System
- Supported by CMMS and other technology systems
  - Inspection & Cleaning
  - R&R Planning
  - SSO Response
  - Flow Monitoring
  - FOG
  - RCM (FM/PS)

Updated CMOM Program

Aging Infrastructure
Regulatory Requirements
Limited Resources
Business Purpose of Performance Measurement

Performance measures should address all levels and tie to Vision and Mission
Role of Effective Performance Measurement

• Provides historic objective performance data
• Sets expected levels of performance
• Provides insight into problem areas
• Provides information for decision making
• Provides incentives to high performers
• Informs stakeholders when to celebrate
• Translates strategy into operational terms
Top 10 Reasons Why Performance Systems Fail

1. Lack of executive commitment
2. Lists of meaningless measures
3. Limited or outdated feedback to staff
4. Lack of recognition or performance awards
5. Flat or unrealistic targets
6. Limited staff buy-in during development
7. Clumsy, time consuming data collection
8. No trending of data
9. Solely focus on quantitative outputs
10. Not tied to goals and strategies
What are We Talking About??

Example: SSOs

Goal: Reduce SSOs by X% annually

SSOs per 100 miles

How are we doing??

Utility Target

Regulatory Guideline

Industry Standard

Best Practice

Time

‘00  ‘01  ‘02  ‘03  ‘04  ‘05
Measures Based On Hypotheses Relating Cause and Effect

Effect

FOG Related SSOs

How do we reduce our FOG related SSOs?

Measure the effect and the known or suspected causes
Cause and Effect Example

How do we reduce our FOG related SSOs?

Measure the effect and the known or suspected causes
Cause and Effect Example

“How do we reduce our FOG related SSOs?

Measure the effect and the known or suspected causes.
Cause and Effect Example

How do we reduce our FOG related SSOs?

Measure the effect and the known or suspected causes
Cause and Effect Example

How do we reduce our FOG related SSOs?

Measure the effect and the known or suspected causes
Benefits of a CMOM Approach

• Forces utilities to look at their operation in a different light
• Provides guidance to the utility
• Improves level of service
• Better management of valuable assets
• Better use of allocated budgets for O&M
CMOM is Not a Destination, it’s a Journey

- Identify staff development opportunities
- Move to a “utility of the future”
- Expose improvements to funding options
- Increase ratepayer interaction

CMOM Program
Key Takeaways ......

- Identify root cause of issues
- Address the components that are deficient
- Many improvement initiatives are interdependent
  - CMMS requires mapping assets
  - Systems need work flow processes defined, etc.
- Measure and realize improvements
A SUSTAINABLE BUILT ENVIRONMENT