“How to Put Together a CMOM Program – Piece by Piece”

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PUZZLED ABOUT CMOM?

Putting Together a CMOM Program
Piece By Piece
Agenda

- Overview of the rule (210.23)
- Sewer Use Ordinance
- O&M
  - Inspection
  - Cleaning
- Overflow Response Plans
  - Emergency generators
  - Portable pumps
  - Power failures
A CMOM program is........
Overview of the Rule NR 210.23

- Reduce Infiltration/Inflow (I/I)
- Eliminate Sanitary Sewer Overflows (SSOs)
- Eliminate basement backups
- “Keep our Wisconsin Waters Clean and Protect Public Health”
CMOM Components (NR 210.23(4))

The holder of a WPDES permit shall implement a CMOM program no later than **August 1, 2016**.

1. GOALS
2. ORGANIZATION
3. LEGAL AUTHORITY
4. OPERATION AND MAINTENANCE (O&M)
5. DESIGN & PERFORMANCE STANDARDS
6. OVERFLOW EMERGENCY RESPONSE PLAN
7. ANNUAL SELF-AUDIT (CMAR)

**GOAL**
ELIMINATE BASEMENT BACKUPS & SANITARY SEWER OVERFLOWS (SSOs)
THE BIG THREE COMPONENTS

“REPORTS” WITHIN A REPORT

- LEGAL AUTHORITY – SEWER USE ORDINANCE
- OPERATION & MAINTENANCE PROGRAM
- EMERGENCY RESPONSE PLAN
Legal Authority

NR 210.23 (4)(c) . *Legal authority.* Legally binding authorities, such as *sewer user ordinances* and service agreements shall ensure the following:
1. “I/I sources .......into building sewers, private interceptor sewers, or other such sources on private property are subject to oversight and control, as necessary”.

**HUH?**

Sewer use ordinances need to address **private property I/I controls** (Televising, repairs, sump pumps, roof & foundation drains, etc)
2. “New sewers and connections, including building sewers and private property interceptor sewers are designed, constructed, installed, tested and inspected to meet all applicable current engineering and construction standards”.

3. “New and rehabilitated sewers, lift stations and other collection system components are installed, tested and inspected to meet all applicable current standards”

**HUH?**

Legal authority (state and/or local) is needed for new public sewer and building sewer design, construction connections & inspection.
4. “If applicable, sewage flows from municipal satellite or privately owned sewage collection systems are, as necessary, monitored and controlled. Any publically owned treatment works may establish specific requirements to regulate sewage flows from satellite collection systems”.

**HUH?**

Sewer use ordinances and municipal user agreements should REGULATE the quantity and quality of sewage from large private and SATELLITE users.
Legal Authority NR 210.23 (4)(c)

5. “Solid or viscous pollutants, such as fats, oils and greases are not discharged into the sewage system in amounts that will cause or contribute to obstruction to the flow in sewers”.

**HUH?**

Your Sewer Use Ordinance should establish some type of grease control and inspection program, perhaps FOG limits.
Establish clear procedures for enforcing the sewer use ordinance with documentation
Sewer Use Ordinance

- *Mechanism used to enforce applicable rules* to their customers (residential, industrial, retail, etc)
- *Prevent materials other than wastewater* from entering the sewer system (such as metals, chemicals, fats oil and grease, & clear water)
- *Provide a mechanism to recover costs* to operate and maintain the interceptors including rehabilitation or replacement of the existing infrastructure or new infrastructure
Ordinance Key Components

- Definitions
- Establishment of new service connections
  - Requirements
  - Permit fee
  - Inspection (Critical!)
- Ownership of sewer lateral
- “Sewer Use” restrictions (including clear water, pretreatment, FOG)
- Legal enforcement
- Fiscal
  - User fees and charges
  - Fines
  - Private property funding
Ordinance Considerations

• **Ordinance is the foundation to implement your rules**

• Legal language – “will it stand up to a court of law”

• **Enforcement**
  • Requires inspection
  • Fees? Fines? Shut off Water? Lien on house?

• Clear water inspection – requires inspection on private property including laterals

• Private property work - who pays?
Stormwater Connections Prohibited

- Downspouts
- Sump pumps – redirected to the sanitary
- Lawn drains
- Swimming pools
- Cross-connections between storm and sanitary

Photos from Visu-Sewer and Donohue & Associates
Downspout Disconnection

- Inexpensive method
- Older areas need to have a place for the water to go (Yards, storm drains)
Sump Pump Illegal Disconnection

- Public Education
- Requires access to building
- Can usually detect “active sump” pump discharges in yard (greener grass, flat grass, etc)
- Wisconsin plumbing code prohibits all foundation drains installed after 1983 to be connected to the sanitary sewer
Legal Authority Summary

1. Private Property I/I
2. New Sewer & Building Sewer Standards
3. Rehabilitated Sewer and Lift Station Standards
4. Control of Sewage Flows (Satellites & Private Sewer Systems)
5. FOG Control
6. Enforcement Procedures
A COMPREHENSIVE COLLECTION SYSTEM O&M PROGRAM INCLUDES:

MAINLINE

+ MANHOLES

+ LIFT STATIONS

+ PRIVATE LATERALS
NR 210.23 (4)(d). *Operation and maintenance.* Operation and maintenance equipment, activities and protocols, including identification and personal and positions responsible, shall include the following:
1. “Adequate maintenance facilities and equipment including equipment and replacement parts inventories, especially critical replacement parts”

HUH?

O&M includes critical replacement parts on-hand
2. “A map of the collection system”

A no-brainer. Paper or GIS. Up-to-date please!
If you don’t have GIS based map, it should be one of your CMOM goals.
3. “A management system for the collection and use of information to identify and prioritize appropriate O&M activities, including identification of structural deficiencies and implementation actions to address such deficiencies”.

**HUH?**

- As each section of sewer is digitally televised, its condition, structural defects and needed repairs or rehab are recorded, ideally, in a sewer system database.
- Each year the Board is advised and prioritizes/budgets accordingly, likely based on risk of failure.
4. “A description of routine preventative maintenance activities such as inspections, televising, cleaning, flow monitoring, root removal and rehabilitation”.

**HUH?**

The CMAR already lists these. Just determine which ones you do and their frequency.

Re-evaluate them every year as part of your self-audit.
Maintenance Activities: (CMAR Question #4)

- Cleaning (% of system/year)
- Root Removal (% of system/year)
- Flow Monitoring (% of system/year)
- Smoke Testing (% of system/year)
- **Sewer Line Televising** (Recommended at least 10% of system/year)
- Manhole Inspections (% of system/year)
- Lift Station O&M (# per L.S/year)
- Manhole Rehabilitation (% of manholes rehabbed)
- Mainline Rehabilitation (% of sewer lines rehabbed)
- Private Sewer Inspections (% of system/year)
- Private Sewer I/I Removal (% of private services)
5. “A program to periodically assess the capacity of the sewage collection system and treatment facilities”.

**HUH?**

This is Step 7 of the Wisconsin CMOM Booklet – Capacity Assurance. Know your sewers! 😊
6. “The identification of activities to prevent and correct frequent and recurring building back-ups caused by sewage collection system hydraulic constraints”.

**HUH?**

Good record-keeping and corrective actions to basement backups needs to significantly rise in priority through your CMOM Program.
7. “Appropriate training on a regular basis”

Collection system operators must receive regular training! NR 114 will require one certified sewage system Operator-In-Charge (OIC), subclass SS over the next decade.
Operations & Maintenance (O&M)

• Foundation for a good CMOM program
• Inspections
  • Manholes
  • Sewers
  • Easements
  • Flow metering and samplers
  • Pump/lift Stations and associated equipment
• Cleaning
  • Sewers
  • Root removal
  • Wetwells
  • Storm sewer curb inlets
• Flow monitoring
• Rehabilitation
Inspection - Where Do I to Start?

- Desk top analysis
- Basin by basin approach
- Highways, state and county highways
- Railroads
- Rivers
- Large diameter & older pipe
- Downstream of force mains
- Street projects *** *(however should not be only inspection)*
O&M Inspection

- Minimum 10 year cycle
- Need a baseline inspection to prioritize work and fiscally spend the dollars
Sewer Inspections

• Use to determine condition of pipe and sources of I/I
• Sewer inspections should be scheduled on a regular basis (ie every 5 to 10 years depending upon system)
• Small diameter sewers inspection/cleaning costs $1.00 to $1.50/foot
Assessments Methods

• Visual inspection
• Internal inspection – (CCTV, Pole cameras, Sonar & Laser)

Envirotech Pole Camera
www.pipetechindustries.com

Aries Cameras
www.ariesindustries.com
Manhole Inspections

• Manholes should be inspected on a regular basis
• One of the most cost-effective methods to identify I/I
• Document surcharging
• Can easily be performed by utility crews
• Recommend GPS coordinates during inspections - can use smart phones to get reasonable data
# MANHOLE INSPECTION FORM

**MH NUMBER:**
- Date: ____________________
- Basin Number: ____________________

**MATERIALS**
- Manhole Diameter: 48” or list other: ____________________

**CONDITON**

<table>
<thead>
<tr>
<th>Manhole Cover</th>
<th>Manhole Frame/Casting</th>
<th>Manhole Cone/Barrels</th>
<th>Manhole Bench/Invert</th>
<th>Infiltration/Surcharge</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast Iron</td>
<td>Cast Iron</td>
<td>Concrete Sections</td>
<td>Concrete-formed</td>
<td>Clay</td>
<td>Smooth Bench</td>
</tr>
<tr>
<td>Other</td>
<td>No Adjusting Drops</td>
<td>Brick</td>
<td>Plastic</td>
<td>Plastic</td>
<td>None</td>
</tr>
<tr>
<td>Offset</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Smooth Invert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cover</td>
</tr>
</tbody>
</table>

**ACTION ITEMS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace MH Cover</td>
<td>Replace gasket</td>
</tr>
<tr>
<td>Raise MH to Surface</td>
<td>Replace frame</td>
</tr>
<tr>
<td>Adjust Frame</td>
<td>Replace barrel</td>
</tr>
<tr>
<td>Add chimney seal</td>
<td>Replace cone</td>
</tr>
<tr>
<td></td>
<td>Rehab bench</td>
</tr>
<tr>
<td></td>
<td>Grout - City</td>
</tr>
<tr>
<td></td>
<td>Grout - Contract</td>
</tr>
</tbody>
</table>

**COMMENTS:**
______________________________

**Connection Information - Show
trench/concrete/diversion:**
______________________________

**Show infiltration:**
______________________________

**Show defects:**
______________________________
Easement Inspections

- Missing manhole covers
- Along rivers, streams
Pump Station Inspection

• Generator (see ORP)
• Wet well level & debris
  • Does the wet well need to vacuumed out?
• Pump operation
• Level and pump controls
• Does lag pump run during wet weather??
Flow Monitoring

- Flow monitoring or some form of ability to evaluate capacity of the collection system is needed
  - Flow meters – portable or permanently installed
  - Flow levels/floats – installed in manholes
  - Visual inspection of manholes during dry and wet weather
O&M Cleaning

- Sewers
  - Systematic approach
  - “Hot spots”, “Frequently Visited Areas”
  - PCBs
- Manholes
- Wet wells

NOTE – NEED TO REMOVE DEBRIS

Contracted price $1.00 to $1.50/foot done with CCTV
Sewer Rehabilitation

- Cured-in-place pipe (CIPP) – trenchless technology
- CIPP 8 to 12-inch diameter budget costs from $30 to $40/foot based on project and size of project (i.e. 1,000 feet versus 10,000 feet)
Manhole Rehabilitation

• Manhole Rehabilitation
  • Can be completed in-house with proper training
  • Replace MH pick hole covers with solid covers
• Cementitious liner more than 50 VF - $125-$150/VF
• Epoxy – more difficult $20/square foot – 13 feet in circumference – $260 to $300 VF
• Composites – $300 to $350 VF
• Poured in Place structure $350 to $400 plus cone, rings, bench
O&M Summary NR 210.23 (4)(d)

1. Inventory of replacement parts
2. Map (up-to-date and ideally GIS)
3. Management (database) system of collection system
4. Descriptions of routine O&M activities
5. Capacity assessment program
6. Building back-up action plans
7. Training
Overflow Emergency Response Plan (ERP) NR 210.23 (4) (f)

NR 210.23 (4)(f). Overflow Emergency Response Plan. An overflow emergency response plan shall identify measures to protect public health and the environment from SSOs, TFOs and building back-ups caused by excessive flow or other hydraulic constraints in the sewage collection system and shall include protocols to ensure the following:
1. Responsible personnel are made aware of all overflows.

**HUH?**

Good internal communications!

CMOM should present the “communication flow during overflow”.
ERP NR 210.23 (4)(f)

2. There is a prompt and appropriate response to and investigation of all overflows, to protect to the extent possible, water quality, the environment and public health.

HUH?

Develop an order of emergency response based on flows, wet well & pipe detention times before an SSO or backup would occur (Where do you go first with what equipment, then next and next?) Clean-up activities should be given.
3. There is appropriate reporting and notification as required under public notification requirements of NR 210.21 (4)(5)(6). The plan shall identify the public health and other officials who will receive notification and identify the protocols and procedures for notification of the public who may be affected by the overflow. Whenever there is a significant or potentially significant risk to public health, public notifications shall include personal contacts who may be at risk from the overflow.

**BLAH. BLAH. BLAH. WHOA! HUH !??**

- CMOM shall state the public notification procedures based on risk of exposure. The higher the exposure risk, the higher (more) level of notifications (radio, posting, barricades, etc)
- Notification shall be sent to the daily newspaper as a minimum
- Examples available from DNR
4. Appropriate personnel are aware of and follow the plan and are appropriately trained.
5. Emergency operations appropriate to the event are implemented.

_HUH?

Collection system operators and staff are trained in all aspects of the Overflow Emergency Response Plan. Annual refresher training and “lessons learned” are recommended.
ERP Summary NR 210.23 (4)(f)

1. Internal communications
2. Response order, timing and clean-up
3. Public notification procedures
4. Plan training of personnel
5. Correct implementation of plan
ERP Overview

• Ensure that you have adequate equipment to address an overflow
  • Bypass pumps
  • Emergency portable generators
  • Permanent generators at larger pump stations
  • Rental agreements for equipment

• Response procedures –
  • Who does what – eliminate duplication of efforts and confusion
  • Determine wet well detention times
  • Address high priority areas first (ie basement backups, etc)

• Adequate personnel to address the emergency
  • Existing staff assigned
  • Staff from other departments
  • Contractors

• Mutual Aid Response
Types of Emergencies

• Sanitary Sewer Overflow
  • Portable bypass pumps with bypass hose?
  • Containment?
  • Emergency Generator?

• Power Outages
  • Emergency generators?
  • Diesel portable pumps?

• Blocked Sewer
  • Jetter or combination vacuum flushing truck
  • Portable bypass pumps with bypass hose?

• Rain events
  • Level gauges in the collection system to determine high flows
  • Portable bypass pumps?
  • Manhole inspections
Summary

- Develop or finalize CMOM program by August 1st, 2016...22 months – start now
- Complete CMAR – and prioritize work via the CMAR
- Go to board or council with prioritized projects ... CMOM is justification for rehabilitation programs
- Audit

Protect Wisconsin Waters... Protect Public Health
Completing a CMOM Puzzle....

- Piece By Piece!!! How else? 😊

- “Inch by Inch, Life’s A Cinch....

  ....Yard By Yard, It’s Very

  Hard”

*CMOM program provides justification for expenditures*
“When It Rains, It Pours”
Capacity, Management, Operation, and Maintenance (CMOM)

Resources for Sanitary Sewer Collection Systems

fadisite presentations can be viewed that provide useful information on CMOM programs:

* CMOM? [11 min]
* What’s in a CMOM Program? [17 min]

Available is the publication Wisconsin CMOM Booklet [PDF].

Preventing sanitary sewer overflows and basement back-ups

Assin has approximately 950 permitted sanitary sewage collection systems. Discharges of
ced or inadequately treated sewage from any place in sewage collection systems are
only referred to as sanitary sewer overflows (SSOs). Discharges of untreated sewage are a potential
have significant impacts on water quality. All SSOs must be reported to the DNR within 24 hours. [PDF]
within 5 days. Typically, SSOs occur as a result of either the entry of an excessive amount of perc
water, known as infiltration/inflow (I/I), into the sewers or there is a mechanical, electrical or structural
collection system. When a sewage collection system has insufficient capacity to transport the sewage,
will relieve itself by overflowing from the sewer system at some point or backing up through a
ent.

n deteriorate over time and develop cracks, breaks, and blockages if not properly maintained. Aging,
systems can be neglected and thus not be inspected or maintained on a regular basis. A CMOM Program
agement tool that owners of collection systems (primarily municipalities) create to operate and
ificantly reduce, if not eliminate, sanitary sewer overflows and basement back-ups. It assures
owners proactively operate and maintain this significant and valuable community infrastructure thro
the system. A CMOM Program is of inestimable value to a community.
CMOM program requirements

Wisconsin Administrative Code NR 210.23 requires that all owners of collection systems, including satellite sewage systems, develop and implement a Capacity, Management, Operation and Maintenance Program by August 1, 2016. A CMOM Program is to assure that a sewage system is properly managed, operated and maintained at all times; has adequate capacity to convey peak flows; and all feasible steps are taken to eliminate excessive infiltration and inflow from the system. A CMOM Program must mitigate the impact of overflows on waters of the state, the environment and public health. Public notification is required of each SSO.

A CMOM Program has eight components:

- "CMOM in Wisconsin" (April 2009)
- "CMOM in Wisconsin 1. Goals" (June 2009)
- "CMOM in Wisconsin 2. Organization" (September 2009)
- "CMOM in Wisconsin 3. Legal Authority" (December 2009)
- "CMOM in Wisconsin 4. Maintenance Activities" (February 2010)
- "CMOM in Wisconsin 6. Overflow Emergency Response Plan" (June 2010)
- "CMOM in Wisconsin 7. Capacity Assurance" (September 2010)
- "CMOM in Wisconsin 8. Annual Self-Audit" (December 2010)

Additional information

For guidance on developing a Wisconsin CMOM program, see the Wisconsin CMOM Booklet. This booklet provides a baseline template for smaller and medium sized communities in developing a CMOM Program.

All communities, especially larger communities, may additionally benefit by reading USEPA’s CMOM Program Self Assessment Checklist and Guide for Evaluating CMOM Programs.

Operation and maintenance activities performed on sanitary sewer collection systems is one of the most important parts of an overall CMOM program. See References for other recommended resources for developing effective collection system operation and maintenance programs.

Contact information

For information on CMOM programs, contact:

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