Sanitary Sewer Overflows

Estimated 23,000 to 75,000 SSO events each year in the United States

Discharge of 3 to 10 billion gallons per year of untreated sewage

Does not include backups into buildings

Source: USEPA
Causes of SSO Events

Source: USEPA
Reported Causes of Blockage

Source: USEPA
<table>
<thead>
<tr>
<th>Cause</th>
<th>Average SSO Event Volume (gallons)</th>
<th>Median SSO Event Volume (gallons)</th>
<th>Total Volume (million gallons)</th>
<th>Percent of Total Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blockages</td>
<td>5,900</td>
<td>500</td>
<td>69</td>
<td>3</td>
</tr>
<tr>
<td>Wet Weather I/I</td>
<td>360,000</td>
<td>14,400</td>
<td>1,860</td>
<td>74</td>
</tr>
<tr>
<td>Mechanical or Power Failures</td>
<td>63,000</td>
<td>2,000</td>
<td>157</td>
<td>6</td>
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<tr>
<td>Line Breaks</td>
<td>172,000</td>
<td>1,500</td>
<td>239</td>
<td>9</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>260,000</td>
<td>1,200</td>
<td>199</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: USEPA
Proposed rulemaking concerning SSOs and CMOM programs has been a matter of public discussion since 2001. Current information can be found at: http://cfpub.epa.gov/npdes/home.cfm?program_id=4.

CMOM program currently implemented under existing State and Federal legislation.
"&\&' III = III &III \\

It is hereby declared that it is the public policy of the State of Illinois that there should be no discharges of oil or other pollutants into or upon any waters which are or may be used for the purposes of providing a water supply for any city, town or village, or for purposes of recreation or navigation and that those persons responsible for such discharges shall bear the costs of removal."
306.102. a) Malfunctions: All treatment works and associated facilities shall be so constructed and operated as to minimize violations of applicable standards during such contingencies as flooding, adverse weather, power failure, equipment failure, or maintenance, through such measures as multiple units, holding tanks, duplicate power sources, or such other measures as may be appropriate.
Excess infiltration into sewers shall be eliminated, and the maximum practicable flow shall be conveyed to treatment facilities.
Overflows from sanitary sewers are expressly prohibited.
Illinois Legislation (Continued)

Title 35: Environmental Protection Subtitle C: Water Pollution, Chapter I: Pollution Control

Board

Part 392 Guidelines for Notification of Restricted Status or Critical Review

Section 392.203. "The Agency may place sanitary sewers and lift stations on Restricted Status in order to prevent overflows as expressly prohibited 35 Ill. Adm. Code 306.103(b). Restricted Status may be imposed upon the confirmation of overflows in the form of basement backups, overflows of sanitary sewer manholes, or sanitary sewer overflow devices."
(d) Duty to mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(e) Proper operation and maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
SPECIAL CONDITION. The Permittee shall work towards the goal of achieving no discharges from sanitary sewer overflows or basement backups and ensuring that overflows or backups, when they occur, do not cause or contribute to the violations of applicable standards or cause impairment in any adjacent receiving water. In order to accomplish these goals, the Permittee shall develop and submit to the IEPA three copies of the Capacity, Management, Operations, and Maintenance (CMOM) plan within twelve (12) months of the effective date of this Permit. The Permittee may be required to construct additional sewage transport and/or treatment facilities in future permits or other enforceable documents.
What is CMOM?

Capacity
Management
Operations
Maintenance
Why CMOM?

- Better manage, operate, and maintain collection system
- Investigate capacity constrained areas of the collection system
- Respond to sanitary sewer overflow events

Intended to help municipalities:
Who is affected?

Every collection system owner, whether they have wastewater treatment facilities or not
CMOM Program Elements (USEPA)

- Designing and Constructing for O&M
- System Inventory
- System Mapping
- Personnel Training
- CMOM Plan
- System Condition Assessment
- Information Management
- Repairs, Replacement, Rehabilitation
- Planning and Scheduling Work
The CMOM plan shall include the following elements:

A. Measures and Activities:
   1. A complete map of the collection system;
   2. Schedules, checklists, and mechanisms to ensure that preventative maintenance is performed on equipment;
   3. An assessment of the capacity of the collection and treatment system at critical junctions and immediately upstream of locations where overflows and backups occur or are likely to occur; and
   4. Identification and prioritization of structural deficiencies in the system.
B. Design and Performance Provisions:
1. Monitor the effectiveness of CMOM;
2. Upgrade the elements of the CMOM plan as necessary; and,
3. Maintain a summary of CMOM activities.

C. Overflow Response Plan:
4. Know where overflows and backups occur; and,
5. Respond to each overflow or backup to determine additional actions such as clean up.

D. System Evaluation Plan.
E. Reporting and Monitoring Requirements.
6. Submission of annual CMOM report by January 15 of each year detailing the previous year's activities.
NORTHWEST SEWER SYSTEM

NORTHWEST FACILITIES
PLANNING AREA &
SERVICE COMMUNITIES

- Fox Lake
- Lake Villa
- Hainesville
- Round Lake
- Round Lake Beach
- Round Lake Heights
- Round Lake Park
- Lakes Region Sanitary District
- Lake County
- Utilities, Inc
**Northwest Regional Facilities**

- Water Reclamation Facility owned by Fox Lake
- Ten Miles of Interceptor Sewers and Forcemains owned by Lake County
- Three Major Pump Stations owned by Lake County
- Round Lake Sanitary District Excess Flow Facility
- Numerous Miles of local sewers and smaller pump stations owned by the 7 Communities
Northwest Lake County Sewer System Advisory Committee
Harbor Ridge Utilities Inc.
Lakes Region Sanitary District
Round Lake Sanitary District
Village of Hainesville
Village of Round Lake
Village of Round Lake Heights
Lake County Public Works
Northwest Region WRF
Village of Fox Lake
Village of Lake Villa
Village of Round Lake Beach
Village of Round Lake Park
Northwest Lake County Sewer System Advisory Committee

**Goals**

Develop technical recommendations, that if implemented will mitigate existing and future sanitary sewer failures such as:

- Sanitary sewer backups
- Sanitary sewer overflows
- Loss of sewage treatment efficiency at the Northwest Regional Water Reclamation Facility

Incorporate recommendations into a regional program for use by NWLCSSA members
Specific NWLSSAC CMOM Program Goals
Unique Considerations for Systems with Multiple Satellite Communities

Cooperative arrangements to develop CMOM programs which have common goals for overall program

Prudent O&M of systems, taking into account different system ages

Equal work efforts (e.g. percent of system televised each year) and equal level of responsibility among participants

Ease of information transfer among participants

Enforcement processes and penalties

Benefits

Cost sharing for program development

Cost sharing for on-going program activities
CMOM
Capacity Management Operations Maintenance
How do you identify and address any bottlenecks in your system?
Capacity Assurance Check List

- Up-to-date sewer system map
- Current Facility Plan
- Up-to-date number of service connections
- Current system flow rates (dry and wet weather) – pump station records
- Pump station capacities
- Program to monitor bottlenecks, capacity constriction areas, problem areas
- Infiltration / inflow analysis
- Sewer system evaluation survey
- Flow monitoring program
No dry weather flow restrictions
Review flows during wet weather events
Identify critical structures
On-going inspection program
Ordinance enforcement
Perform regular field investigations. Investigate, document, and report problem areas, backups, and overflows. Incorporate observations from field investigations into repair recommendations.
Member utilities must make system repairs to reduce public system sources of I&I. Member utilities must have ordinance which requires property owners to maintain service connections and prohibits clean water sources to the sanitary sewer. Member utilities to encourage customers to disconnect downspouts, sump pumps, footing drains, and area drains from the sanitary sewer.
NWLSSAC Flow Monitoring Plan

Visual monitoring during dry and wet weather conditions

Flow meter readings or pump run times documented under dry and wet weather conditions and compared against historical data to evaluate system flows and capacity.

New pumping stations with design capacities of 1,200 gpm or more to be equipped with flow meters.

Observations of significant increases in dry or wet weather flows to result in investigation of service area (sewer televising, dye testing, smoke testing, flow monitoring with flow metering equipment).

Dry and wet weather flow monitoring to be performed in areas of high I&I.
All members must document and record service connections, committed service connections, and available system capacity annually. Facility planning to be reviewed and updated periodically to ensure sufficient system capacity for planned future growth.
Capacity
- Time and date call was received
- Callers name and phone number
- Location of problem
- Description of problem and observation
- Any other information that may help responders

Capacity
SSO Notification Procedures

Responders
Emergency management officials
Municipal officials
Regulatory agencies
Affected customers / public

Capacity
Third Party Notice Plan

Describes how, under various overflow scenarios, the public and others would be notified of overflows that endanger health

Identifies what overflows will be reported

Identifies who will receive notification

Identifies the specific information to be reported

Includes a description of lines of communication

Includes identities of responsible officials
Procedure for Responders

Required personnel (in-house staff and subcontractors)

Required equipment

Probable response activities and methods

Response time standards

Persons/agencies to be notified of the SSO

Post response reporting

Reasons for the SSO

Necessary actions to prevent same or similar occurrence from happening in the future

Capacity
Elements of Major Emergency Response Plan

- List of critical customers (hospitals, schools, municipal facilities, fire stations, police stations, nursing homes)
- Procedure for notification / communication of emergencies
- List and location of critical system components
- Potential threats and response procedures (man-made, accidental, natural threats)
- Preventative measures (access control, barriers, backflow preventers, testing and maintenance)
- Emergency contact information directory
Management Plan Elements
Who is responsible for what tasks in your community?
Who can you call in affiliated communities?
Identify Critical Structures and Components

- Lift Stations / Forcemains
  - Capacity
  - Number of connections
  - Time before SSOs or basement overflows
  - Proximity to sensitive areas
  - Emergency power availability

- Sewers
  - Number of connections
  - Time before SSOs or basement overflows
  - Proximity to sensitive areas

Management
Customer Service

- Handling of complaints and emergencies
- Documentation and tracking of problems
- Information on succession plans
Program Authority and Fiscal Responsibility

Can you legally do what you need to accomplish?
Are regulations, standards, and ordinances up-to-date?
Are requirements the same for all satellite communities?
Are operation and maintenance activities adequately funded?

Sewer Use Ordinance
Maintenance of Sewer Laterals
Infiltration and Inflow Control
Illegal Connections and Discharges
Fats Oil and Grease Elimination Program
Industrial Pretreatment Program

Standards of Design, Construction, and Inspection

User Charge Ordinance

Management
Safety Training Management

Use Lockout Before Working on Equipment

OSHA® Training Institute Education Centers

Management
Performance Tracking

Are programs in place to verify that you accomplish what you set out to do?
The future depends on what we do in the present.

-Mahatma Gandhi
Operation and Maintenance Plan

NWLSSAC Goals

100% of sewers to be televised within 10 years, with a minimum of 10% of sewers inspected per year on a cumulative basis.

100% of manholes to be inspected within 10 years, with a minimum of 10% of manholes inspected on a cumulative basis.

All pumping facilities to be inspected weekly at a minimum, all wet wells to be cleaned annually, annual in-depth inspection required.
Operation and Maintenance Plan

NWLSSAC Goals (continued)

- All critical structures to be inspected monthly and during significant wet weather events.
- Air relief valves to be inspected monthly.
- 100% of sewers to be cleaned within 10 years with a minimum of 10% cleaned per year on a cumulative basis. Critical areas to be cleaned more frequently.
- All grease traps to be inspected annually.
- Suspect traps to be inspected more frequently.
- Root removal to be done on an as-needed basis.
NWLSSAC Goals (continued)

System repairs to address major deficiencies (structural problems, major root intrusion, major I/I) to be performed at earliest opportunity.

Other repairs to be prioritized with the goal to be completed within 2 years.

All critical structure defects, grease trap defects, and air relief valve defects to be repaired as soon as possible.

Operation and Maintenance
You've developed your CMOM Plan....
Annual Audit and Communication

Annual audit
CMOM plan
Performance evaluation and monitoring
Provide recommendations for infrastructure and plan improvements

Update the CMOM plan
Communication
Annual summary report
Presentations to community officials

“EACH OF YOU HAS BEEN GIVEN A SIMPLE, YET POWERFUL TOOL...”
Additional Accountability and Enforcement Audit for Systems with Satellite Communities

Annual review by Advisory Committee to confirm all communities are making progress toward CMOM objectives.

Local surcharge fees assessed to any community failing to fulfill CMOM objectives, as determined by a consensus of the committee.

Surcharges fee used to fund improvements within the deficient community sewer collection system or to regional improvements.
Current Program Status

Reviewing Year 1 Annual CMOM Report of Member Utilities

CMOM Sub-Committee Meeting

July, 2014

Results … To Be Determined
INFLOW AND INFILTRATION SOURCES

PUBLIC & PRIVATE I/I SOURCES

PRIVATE SMP PUMPS