

City of Akron, Ohio

CMOM Program Overview

Ohio Water Environment Association 2013 Annual Conference

BURGESS & NIPLE

**Brown AND
Caldwell**



**Water Environment
Association**

*Preserving & Enhancing
Ohio's Water Environment*

June 19, 2013



AGENDA

- Introductions
- CMOM Background/History
- CMOM Plan: *Program Elements*
- Successes and lessons learned
- Wrap Up and Questions



Introductions

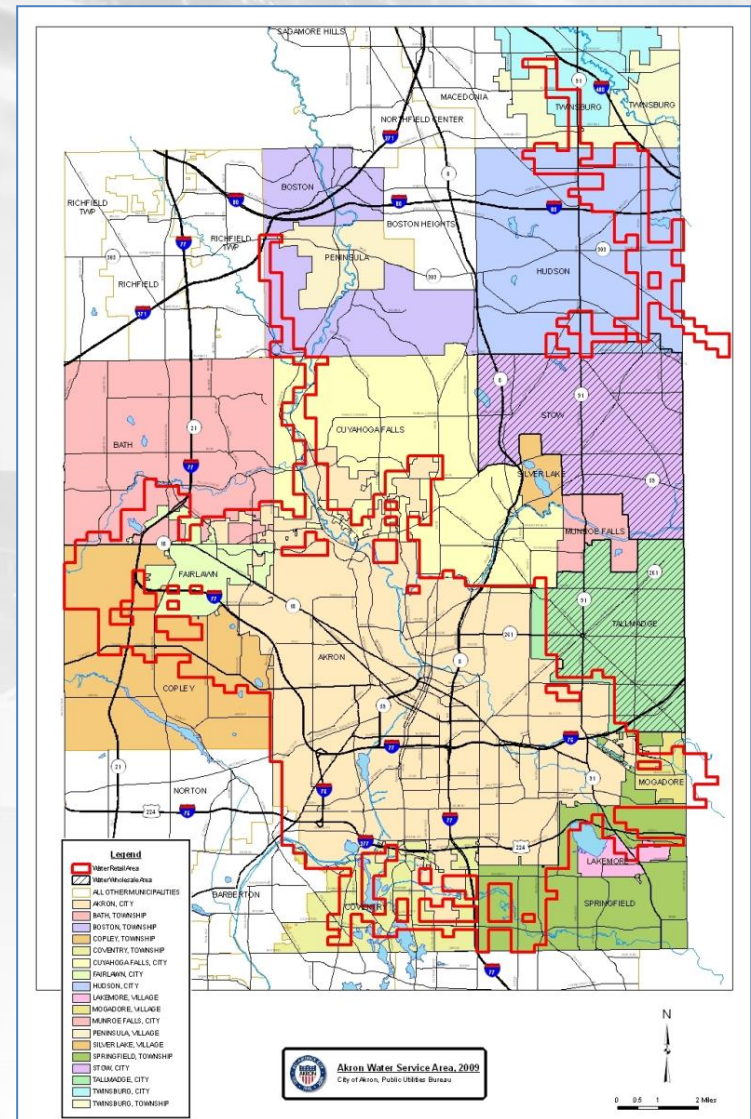
- CMOM Team
- City (Multiple Departments)
- CSO Program Manager
- Burgess & Niple
- Brown and Caldwell



Akron CMOM Team

Service Area

- City of Akron is 62 square miles
- Including Joint Economic Development Districts (JEDD's) - service area is 110 square miles
- Serves 300,000 people



Sewer System Components

- 700 miles of sanitary sewers
- 160 miles of combined sewers
- 19,224 manholes
- 10 master meter locations
- 36 pump stations
- 22 miles of force mains
- 34 CSO racks
- 2 CSO storage basins



Sewer Maintenance Functions

- Daily collection and conveyance of sanitary sewage and storm water
- Daily inspection and cleaning of combined sewer overflow (CSO) racks
- Daily operation and maintenance of pump stations and CSO storage basins
- Snow and ice removal
- 24/7/365 complaint response
- Currently 46 field staff, 8 office staff



Long Term Control Plan History

- Long history
- Consent Decree lodged in 2009
- CMOM Plan and SORNP submitted to USEPA in early 2010
- USEPA *approved* the CMOM Plan and SORNP in October 2012
- Waiting on Federal Court approval of Consent Decree
- Moving forward and meeting all requirements of CD and LTCP



Long Term Control Plan Goals

- Reduction in Events, Hours and Volume of CSO
- NO UNTREATED OVERFLOWS IN TYPICAL YEAR
- Elimination of Overflows to the Ohio Canal
- Biological Treatment of ALL WPCS Secondary Bypass
- Reduction in Mud Run Pump Station Overflows
- Improved Operation and Maintenance of the Sewer System
- Supplemental Environmental Project (St Rt 82 Dam)



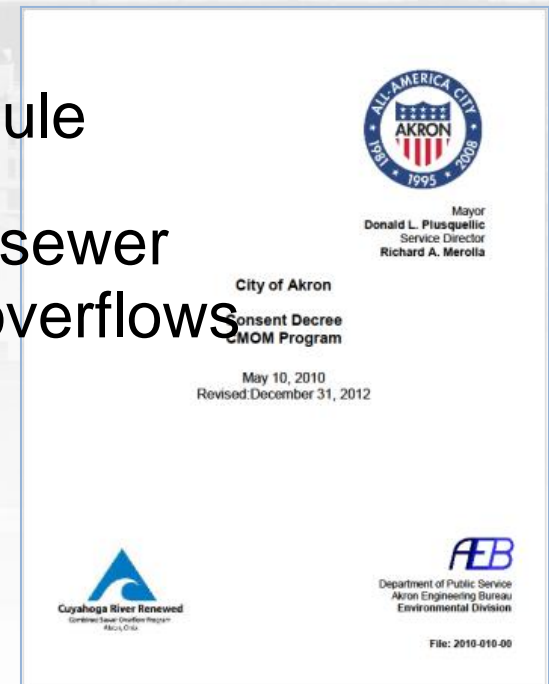
Projects / Requirements

- 10 Storage Basins
- 2 Large Diameter Storage Tunnels
- 5 Sewer Separations Projects
- Main Outfall Interceptor Relief Sewer
- Mud Run Pump Station Upgrade
- **CMOM**
- Improvements to the Water Pollution Control Station (WPCS)

\$875 Million- October 2027

CMOM

- **C**apacity, **M**anagement, **O**perations and **M**aintenance of Sanitary Sewer Systems
- Guidance from proposed USEPA SSO Rule
- A primary objective is to reduce sanitary sewer overflows (SSOs) and combined sewer overflows (CSOs)



CMOM Objectives

- Provide high level of customer service
- Reduce regulatory noncompliance
- Optimize equipment, human and financial resources for operations and maintenance
- Proactive rather than reactive approach
- Improve communications and reporting



CMOM Program Elements

Consent Decree Requirements

- Sewer Overflow Response / Notification Plan (SORNP)
- Daily CSO Rack Inspections
- System Wide Cleaning
- Condition Assessment
- Repair of Acute Defects
- Develop Root Control Program
- Fats, Oils and Grease (FOG) Program



CMOM Program Elements

Consent Decree Requirements

- Maintain Sewer System Component & Equipment Inventory
- Preventative Maintenance Program for Pump Stations
- Develop a Sewer System O&M Manual
- Manhole Sealing
- Proper Design and Construction
- Root Cause Analysis of System Failures
- Training and Adequate Equipment



CMOM Program Elements

- SORNP

- Ensure immediate and consistent response
- Remediation of failure
- Proper reporting procedures
- Appropriate training



Mayor
Donald L. Plusquelic
Service Director
Richard A. Merolla

City of Akron

Consent Decree
Sewer Overflow Response and Notification Plan

February 10, 2010
Revised: August 10, 2012



Department of Public Service
Akron Engineering Bureau
Environmental Division

File: 2010-010-00



CMOM Program Elements

- Rack inspection and cleaning program
 - Daily inspection
 - 34 Active



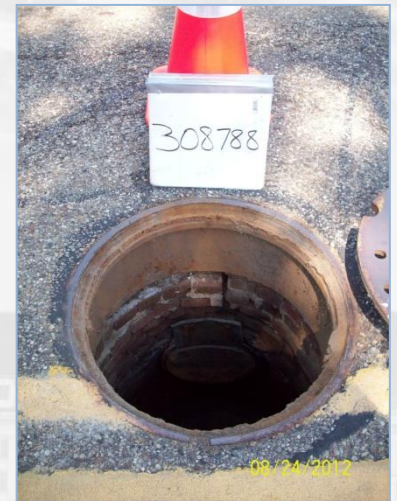
CMOM Program Elements

- Cleaning of gravity sewers
 - Every 5 years (20% a year)
 - Complete first cycle by Dec. 31, 2014
 - Continue cleaning on a 5 year cycle



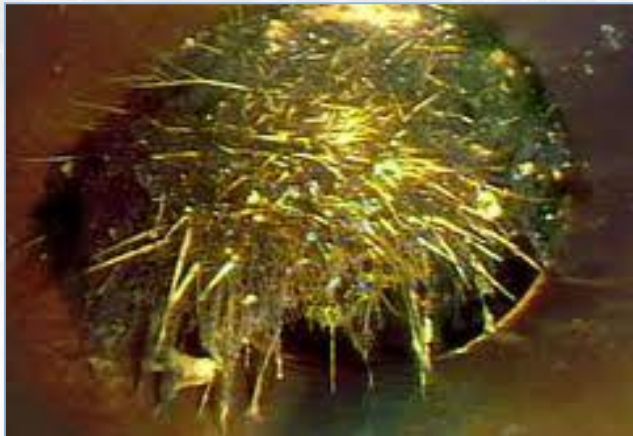
CMOM Program Elements

- Condition Assessment – Proactive Inspection
 - CCTV at least 20% of gravity sewers each year
 - High maintenance areas (Trouble List)
 - Root List
 - Speed Rodder (FOG) List
 - Inspect SO locations within 2 weeks
 - Inspect all manholes every 5 years



CMOM Program Elements

- Root Control Program
 - Corrective measures for root intrusion
 - Schedule cleaning of known problem areas
 - Short-term mitigation
 - Rehab of areas causing recurring blockages



Refine existing program

Evaluating CCTV of current locations to adjust frequencies

Focus cleaning efforts on 20% annual goal

CMOM Program Elements

- Fats, Oils and Grease (FOG) Program
 - Identify and mitigate trouble spots
 - Coordinate with Health District to inspect and follow-up on trouble spots from Food Service Establishments (FSEs)
 - Educational efforts aimed at FOG sources and new rules –
 - Bulk mailing to all FSEs
 - Information sheets distributed by SCHD during routine FSE inspections

Revised Sewer Use Ordinance

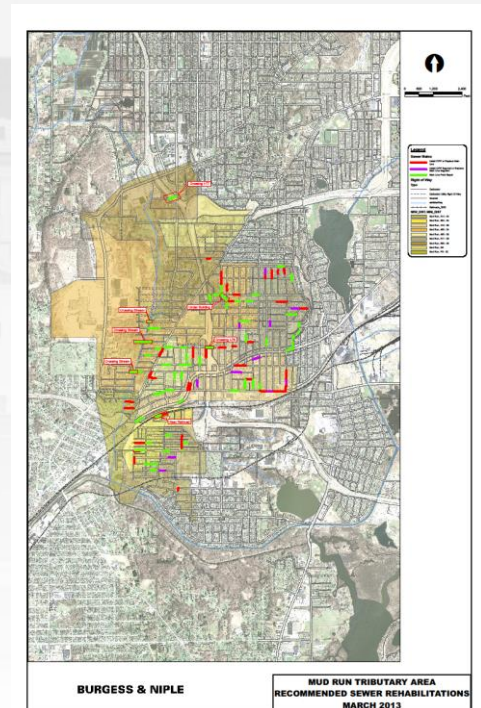
Partnered with the Summit County Combined General Health District and DOES

Developed SOP for reporting problem areas found in the system

Grease trap maintenance rules in Sewer Use Ordinance

CMOM Program Elements

- Sewer System Component and Equipment Inventory
 - Maintain & Update GIS Mapping
 - CMMS for Sewer System – INFOR
 - CMMS for vehicles - FleetFocus



CMOM Program Elements

- Pump Stations and Force Mains
 - Routine preventative maintenance program

- Manholes
 - Sealing (where appropriate) and maintenance



PUMP STATION LOGSHEET	
Date	Time of Arrival Operator
Weather Conditions:	
Test Results or Readings:	
Flow Meter Reading	Elapsed Time Reading
Flow Present Reading	
Flow Previous Reading	
Flow Total	
Telemetry Tested: (monthly)	yes <input type="checkbox"/> no <input type="checkbox"/>
Station Failures:	yes <input type="checkbox"/> no <input type="checkbox"/>
Power	Equipment
Approx. Time of Failure	Time Restored
Work Orders Written:	yes <input type="checkbox"/> no <input type="checkbox"/> Number
Maintenance Req'd	
Physical Condition of Station Acceptable: yes <input type="checkbox"/> no <input type="checkbox"/>	
Interior	
Exterior	
Equipment Checked: yes <input type="checkbox"/> no <input type="checkbox"/>	
Pumps Backflushed	Valves Exercised
Bubbler Purged	Condensate Drained
Seal Filter	Generator E.T. Reading
Motor/Generator	
Equipment Lubricated: yes <input type="checkbox"/> no <input type="checkbox"/>	
Pumps	Motors
Valves	Other
Well Well Checked: yes <input type="checkbox"/> no <input type="checkbox"/>	
Grease Accumulations	
Condition of Sewage? Odors?	
Condition of Overflow	
Special Remarks:	

CMOM Program Elements

- Review of Construction techniques
 - Identify and remediate poor practices
- New Sewers
 - Ensure they are properly designed and constructed



CMOM Program Elements

- Repair, Rehabilitation and Replacement
 - Properly designed and constructed
 - Repair all acute defects within 1 year
 - Address defective pipes based on CA
 - Maintain log of completed projects

Project ID	Location	Description	Status	Start Date	End Date	Contractor	Cost	Notes
001	123 Main St	Replace 150' of 12" pipe	Completed	2023-01-15	2023-02-28	ABC Construction	\$120,000	Acute defect
002	456 Elm St	Rehabilitate 200' of 18" pipe	In Progress	2023-03-01	2023-05-31	DEF Contractors	\$250,000	Chronic issue
003	789 Oak St	Install 300' of 24" pipe	Planned	2023-06-01	2023-08-31	GHI Builders	\$380,000	Preventive

CMOM Program Elements

- Complaints, Work Orders and Updates to Inventory
 - Scheduling and tracking maintenance activities
 - CMMS – infor EAM[®] (was DataStream 7i)
 - Improve documentation
- Corrective maintenance
 - Response
 - Reporting



CMOM Program Elements

- Training and adequate equipment
 - Identify and address problems that lead to SSOs and CSS releases
 - PACP training for CCTV Crew



On-going, continuous process

- ✓ *SORNP Training*
- ✓ *CMOM Awareness Training*
- ✓ *PACP Training*
- ✓ *Vendor Training*

CMOM Program Elements

- Root Cause Analysis (RCA)
 - SOP developed
 - Evaluate failures of system to perform as designed
 - All SSO or CSS releases to be analyzed
 - Document operational variables
 - Access database format for automation
 - Recommended actions and follow-up

Wastewater Collection System Failure Analysis Form FA # _____

TYPE: SSS CSS PS WEATHER: Dry Wet

Overflow Information: Event Date: / / Event Start Time: : AMPM Event End Time: : AMPM
 WOI: Job Code: Pump Station: Pump Station ID #
 Address: Drainage Basin: Asset ID # Asset Age (if known):
 Did failure result in a SSO/CSS Overflow: YES / NO Alarm Received YES / NO If NO, How discovered:
 Sanitary: Combined: Number of Properties Affected: Address(es):
 Manhole Depth: Pipe Size: Pipe Material: Number of Properties Affected
For Wet Weather Events: Rain Gauge Date: inches Rain Intensity: inches/hour
 Describe Failure: Possible Cause:
 Construction Activity Upstream Of Location: Yes / No How Many Feet From Overflow/Failure: Location:
 Ohio EPA Notified (within 24 hrs of event): YES / NO / NA Notifiy SCPH: YES / NO / NA

Root Cause Analysis Information: Asset(s) ID#: _____ WOI: _____
 CCTV Inspection Date: / / CCTV Technician: _____ PACP Score: OM _____ Structural _____
 Other Investigation Information: _____
 Describe Root Cause: _____

Historical Data/Maintenance History:

WO #	Date	Job Code	Date Last Cleaned	Date Last CCTV	Description/Actions

Summary of Pump Station Maintenance: Last Pump Station Inspection: / / Inspected By: _____
 Discrepancies/Maintenance Performed: _____
Recommended Action: Repairs Required: YES / NO (Identify below) Additional Maintenance Required: YES / NO (Identify below)
 Add to Trouble List _____ Frequency _____ Grease Investigation _____ Other _____
 Additional Maintenance (Describe): _____
 Repairs Required (Describe): Repair _____ Replace _____ Line _____ Other _____
 Asset(s) ID #: _____ Footage: _____ Start Date: / / _____
Assign Work:
 In House Maintenance/Repair: YES / NO WOI: _____ Goal Completion Date: / / Completed Date: / /
 Add to Capital Improvement Rehab/Replacement List: YES / NO Project # _____
 Goal Completion Date: / / Completed Date: / /
 Comments: _____

RCA PROCESS: _____ In Progress _____ Complete (Reviewers initial and date below)

CMOM Review _____ Superintendent Review _____ AEB-Env/Const. Review _____
 Date: / / Date: / / Date: / /



RECOMMENDED ACTION: _____ Complete Date: / / By: _____



CMOM Program Elements

- Operations and Maintenance Manual
 - Consolidate into one Sewer System O&M Manual
 - Annual update



CITY OF AKRON, OHIO
SEWER SYSTEM
and
PUMP STATION
OPERATION AND MAINTENANCE MANUAL

Department of Public Services
 Akron Public Utilities Division
 Water Pollution Control

Department of Public Services
 Akron Engineering Services
 Environmental Division

P27-LANE OF THE WOODS
PUMP NO. 1

MANUFACTURER		DISTRIBUTOR	
Gorman-Rupp		Craun-Liebing	
Address	P.O. Box 1217 Mansfield, Ohio 44890-1217 (419) 755-1011	Rep	Randy Koops
Phone	(419) 755-1263	Address	11801 Clifton Blvd. Cleveland OH 44107
Fax	8:00 a.m. - 5:00 p.m. EST	Phone	(216) 228-7800 ext 104
Office Hours		Fax	(216) 228-7905
Email		Mobile	(216) 533-8212
Website	http://www.gormanrupp.com/	Email	www@akron@craunliebing.com
		Website	http://www.craunliebing.com

SPECIFICATIONS	
Location	Pump Station - Pump Room
Date Installed	2010
Control	Gorman-Rupp EPS 2000 with bubbler, Pressure transducer back-up

NAMEPLATE DATA			
MODEL NO	V53A60-8	PUMP	
SERIAL NO.	1475629N	GPM	413
IMP. DIA.		TOTL	169
		HPM	
MAKE	WEG	HP	50
SERIAL NO.	150K23D-1010195735	HPM	1173
MODEL NO.	Ph/62/V	HPM	3/60/208-230
TYPE		FRAME	

Sewer Maintenance Division P27-Lane of the Woods Pump Station
 Sewer System and Pump Station Operation & Maintenance Manual Page 5

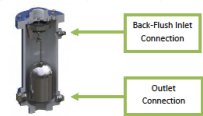
1.2 Air Release Valves

Air release valves (ARV) are installed along the pipeline at high points to provide a place where entrapped air can be released. If too much air accumulates in a pressure pipe, the pipe will become "air bound" and the pumps will not be able to pump as designed. Most ARVs are installed in valve vaults so they can be accessed for inspection and cleaning. These valves need to be maintained at least annually to ensure they are working properly. Not only do they let air out of the system, they allow some air to enter the pipe to prevent a vacuum condition from developing that might collapse the pipe. Faulty or non-working ARVs can result in:

- > Water Hammer
- > Increased Energy Costs
- > Faulty Seals and Pumps
- > Pump Curve Anomalies/Discrepancies
- > Lower Pumping Volumes
- > Longer Pump Cycles
- > Possible Pipe Breaks
- > Wet and/or Flooded Valve Chambers

ARV maintenance includes periodic cleaning to remove build-up of grease and bio-film from the interior of the valve. The periodic inspection is done to verify operation and check for leaks. If the valve is leaking, it is not seating and should be back-flushed. Most manufacturers recommend a monthly inspection and back-flush. However, in reality the industry standard is to complete an annual check and back-flush. ARVs that have been found to be problematic should be checked more often. Refer to the SOP, "Force Main Air Valve Inspection", for more information.

Figure 4.1. A Typical Air/Vacuum Release Valve (Desunk APCO Valve)



Sewer Maintenance Division Sewer System and Pump Station Operation & Maintenance Manual Page 1

Successes and Lessons Learned

- Dealing with *extraordinary* amount of CCTV and inspection data ()
 - CMMS tools
 - ICOMM
 - GIS
 - Videos
 - Access databases
 - Tracking work
 - Decision Model



Successes and Lessons Learned

- Tablets
- Used for manhole inspections
- Tracking sewer cleaning
- Next day updates of completed work



Successes and Lessons Learned

- Redzone Solo Units
 - Rapid deployment in two directions from single manhole
 - Excellent quality video results
 - Sewers *must* be cleaned & debris removed prior to use



Inspection Results
Powered by ICOM3SM

- Spherical Video
- 360° Pan-Tilt-Zoom Viewing
- Deployment Manhole GPS
- PACP/WRc Report
- Comprehensive Operational Statistics

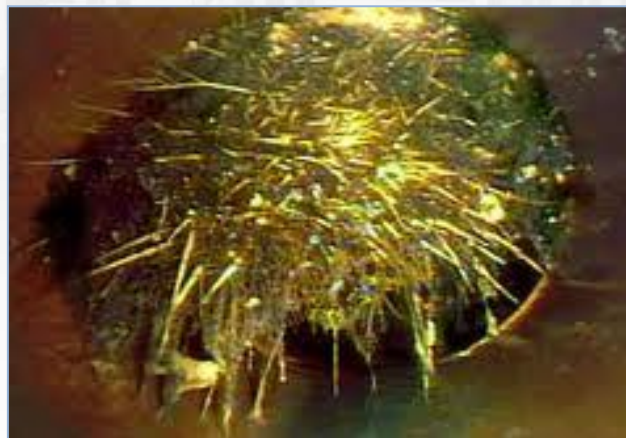


Successes and Lessons Learned

- Trouble List Maintenance

- Root List (8 miles)

- FOG List (17 miles)



Successes and Lessons Learned

- Problem areas (in terms of basement backups) were targeted first and significant debris was removed from some large diameter sewers
 - From the amount and type of debris removed we are anticipating a reduction in basement backups in some areas
 - Waiting on data for number of backups to determine amount of capacity recovered



Successes and Lessons Learned

- Large Diameter Cleaning



Successes and Lessons Learned

- General condition of sewer system structures
 - Surprisingly good condition
 - Large diameter brick sewers & manholes very good in most places
 - Tile sewers – mixed condition



Successes and Lessons Learned

- Inspection prior to cleaning when possible
 - Large diameter – works best





Sewer Worker - 1920's

I will now entertain questions.

City of Akron Website

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