Into the FOG
Part 2
Implementations & Innovations

Wednesday December 12 2019
1:00 - 3:00 PM ET
How to Participate Today

• Audio Modes
  • Listen using Mic & Speakers
  • Or, select “Use Telephone” and dial the conference (please remember long distance phone charges apply).
  - Submit your questions using the Questions pane.
  • A recording will be available for replay shortly after this webcast.

Today’s Agenda

• Introductions
  • Nicholas Anderson

• Securing Wins from the Ground Up
  • Don Johnson

• Monitoring the Fatberg
  • Michael Goldrich

• FOG Control: Going Beyond Enforcement
  • William Kent

• Q & A
Securing Wins From the Ground Up

The Benefits of Collaboration on Design and Construction
What - Key Elements

- Pre-design consultation
What - Key Elements

Why

- Implementation and Adherence to your Sewer Use Ordinance (SUO)
  - Protection of collection system and treatment facilities in a most cost-effective appropriate manner
**Why**

- Implementation and Adherence to your Sewer Use Ordinance (SUO)
  - Determining whether an industry needs permitting, spill plan, inactivation step for Biological Safety Levels (BSL) etc.
  - Determining the appropriate Pretreatment devices for each individual project
  - Prevent concessions by adhering to the SUO and its requirements
  - Prevent costly corrections or retro-fits after construction has finished

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**Why we require Pretreatment devices?**

- Sampling equipment and flow monitoring at industries to help identify wastes streams and loading rates of pollutants to Treatment Plants.
- Reduce the amount of Fats, Oils & Grease (FOG)
- Oil/water separators at car wash and automotive facilities, hydraulically operated elevators.
Who

- Business Owners and Industries

Automotive

Car Wash

Industry

Commercial Labs
Who

- Planning, Inspections and Permitting Department

Who

- Partnership with Building Code Officials
Who
- Design Engineers, Architects, Contractors & Builders

When
1. Prior to any design - ideally
2. Site plan review - general comments

GENERAL NOTES
1. With the right design firms and planners, no obstruction is too high. Always review current regulations, best practices, and industry standards. Modify or remove VPCs, poles, walls, and fences where possible.
2. All construction shall conform to the current Town of Cape May standards and specifications.
3. All extensions shown on site plans are subject to review by the Town of Cape May.
4. Public Safety and Health Administration (PSHA) standards for drainage, soil, and erosion control are mandatory. Contact PSHA for specific requirements.
5. Equipment and products of otherthan those approved by the Town of Cape May shall be used with the Town's approval. The contractor shall provide a copy of the approval for reference.
6. Contractor shall maintain an "as-built" set of drawings to record the exact location of each utility system. These drawings shall be provided to the engineer upon completion of the project.
7. Existing underground systems shown on drawings shall be updated during construction. Any changes to underground systems shall be recorded on the "as-built" drawings.
8. OSDs shall be installed on main and stressed areas.
9. The contractor shall note that any changes not shown on the site plan, including modifications, shall be reviewed by the Town of Cape May.

SANITARY SEWER NOTES
1. Stormwater inlets shall be provided for all buildings with final floor elevations 25 feet above street level.
2. Minimum grade for a 12-inch sanitary sewer collection line shall be 0.5 percent.
3. Minimum size for a 12-inch sanitary sewer collection line shall be 10 feet.
4. All sanitary systems shall be designed in accordance with the Town of Cape May standards and specifications.
5. A public sanitary sewer connection point shall be required from the Town of Cape May for sewer pipe installation.
6. All sanitary systems in residential areas shall include a 2-foot sanitary sewer pipe. The contractor shall provide a copy of the "as-built" drawings for review.
7. Grade information and any changes to the site plan shall be noted on the "as-built" drawings. Any changes shall require the Town of Cape May's approval.
8. SANITARY SEWER NOTES shall be included in the contract documents. The contractor shall be responsible for ensuring compliance with the Town of Cape May's standards and specifications.
3. Building plan review - electronic/paper

- A Utility Pretreatment Groundwork (U100)
- A Utility Pretreatment Rough-in (U200)
- A Utility Pretreatment Final (U300)

4. Field Inspections - ground work
When

4. Field Inspections - under slab ideally

When

4. Field Inspections - ground work
When

4. Field Inspections

• 5. Upon completion of project
How do we get our requirements out?

How

➢ Town of Cary Website
How

- Organizational awareness/collaboration - we have a step in plan review and have field inspections place holders.
HOW

- Pre-construction meetings
- Development Liaison Department

Additional Benefits Realized

- Industrial Wastewater Survey
- Opportunity to identify and understand new sewer users
- Pretreatment device education
- Guide the design
Questions?

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919-414-8052

www.townofcary.org
Why do we monitor for FOG?

- Our goal is to have a free-flowing collection system, unobstructed by debris.
- Fats, Oils, and Greases clog sewer pipes, which prohibits the free flow of wastewater in the collection system.
- To reduce the risk, we encourage source control with pretreatment limits.
Autopsy of a Fatberg

2018 London Fatberg

Is FOG a Local Problem?

The good habits of Cook County citizens coupled with the ginormous size of our tunnels help keep our waste moving.
Outreach Efforts

Metropolitan Water Reclamation District of Greater Chicago

Press Release

For immediate release
November 21, 2019

This Thanksgiving, put your pipes on a fat-free diet

As today’s diners enjoy meals across tables throughout Cook County, the Metropolitan Water Reclamation District of Greater Chicago (MWRD) encourages the public to think before disposing fats, oils and grease this Thanksgiving.

Known as FOG, these fats, oils and grease can create challenges for wastewater systems. Fat, cooking oil, meat drippings and other substances are often dumped down drains and sewers, leading to clogged pipes, hazardous collection systems and overflowing treatment plants. These substances can transform the amount of holiday wastewater into class waste.

"Soup's up! Fats, oils, greases and leftovers can work havoc when sent down the drain to flow to treatment plants,” said MWRD President Martin Tremmel. "Just like the arteries that keep our blood flowing, the wastewater system that leads to our treatment plants takes considerable maintenance. We urge the 5.25 million residents we serve to help protect our wastewater environment.”

Who do we Monitor?

Fats: Solid at Room Temperature
Oils: Liquid at Room Temperature
Grease: Turns to Liquid When Heated, Solidifies When Cooled

From food scraps, cooking oil, soap, and other residential sources.

Paints, lubricants, biodiesel production, and other industrial sources.
**Who do we Monitor?**

- Food Manufacturers
- Centralize Waste Treaters
- Landfills

**Limits**

**Local Limit**
250 mg/L

**Polar and Non-Polar Limits**
For Categorical Regulated Facilities
When do we Monitor?

- Compliance sampling
- When a sheen is observed
- Wastewater is from a kitchen

FOG Violations

<table>
<thead>
<tr>
<th>Year</th>
<th>Value (mg/L)</th>
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<tbody>
<tr>
<td>2015</td>
<td>7,802</td>
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<tr>
<td>2016</td>
<td>77,977</td>
</tr>
<tr>
<td>2017</td>
<td>37,198</td>
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<tr>
<td>2018</td>
<td>20,628</td>
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<td>2019</td>
<td>37,034</td>
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Clogged Sewer

Raining FOG
Closed Landfill Exemption

In 2015, the Sewage and Waste Control Ordinance was updated with the following language:

Effluent leachate discharges from landfill facilities that are closed for the acceptance of wastes shall be exempt from this limitation for Fats, oils and greases (FOG) (total), provided that approved Best Management Practices (BMPs) are implemented and maintained. Failure to adhere to BMPs may result in enforcement action.

What is the Solution?

Good housekeeping
• Cleaning connection between facility and sewer
• May result in a decrease of user charges
• Extends the life of flow measurement equipment

Alternate uses
• Resource Recovery
• Conversion to feedstock
Resource Recovery

Biogas Utilization
• Promotes biogas production

Biological Phosphorus Removal
• Limit FOG same as with local limits
• Clogs in pumps and pipes
Biogas Utilization

- Introduction of FOG can improve production
- Electricity and Heat
- Natural gas and Biofuel

Thank you

Contact Info:
(312) 751-3049
goldrichm@mwrdd.org
FOG Control: Going Beyond Just Enforcement

Fats, Oils & Grease
Going Beyond Just Enforcement
FOG Program History

- Began in 1997
- Over 750 stop ups in sewer mains
- Causing Sanitary Sewer Overflows
- No controls on majority of restaurants
- Residential areas had major issues from FOG

Beginning the process

- Contacted the business license office
- Obtained a list of all restaurants in Columbus
- Began systematically inspecting all facilities
- Used EPA and WEF guidelines for inspection
- Began with larger restaurants having them install or fix old in-ground traps
The process continues

• Next were the secondary or smaller restaurants (Mom and Pop Stores)
• Less of a contributary load, but had multiple locations
• Began educating and trap installation

Stages of Enforcement

Grease Related Sewer Main Stop-Ups (Columbus System)

In-ground grease trap
pumpout/installation/permitting began

Under-the-counter grease trap
pumpout/installation/permitting began

<table>
<thead>
<tr>
<th>Year</th>
<th># of Days</th>
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<tr>
<td>1999</td>
<td>715</td>
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<tr>
<td>2000</td>
<td>658</td>
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<td>2013</td>
<td>140</td>
</tr>
<tr>
<td>2014</td>
<td>131</td>
</tr>
<tr>
<td>2015</td>
<td>28</td>
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Began permitting haulers and manifesting loads to treatment facility

- CWW permits and inspects all haulers that utilize CWW for disposal
- Manifested each load to the facility
- Majority of all hauled waste goes to head of the plant
- Later CWW built a FOG receiving station

But it was so much grease for the treatment plant

<table>
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<tr>
<th></th>
<th>2017</th>
<th></th>
<th>2018</th>
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<tr>
<td>Grease</td>
<td>1,581,409</td>
<td>Grease</td>
<td>1,607,440</td>
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<tr>
<td>FT Benn</td>
<td>360,485</td>
<td>FT Benn</td>
<td>257,700</td>
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<tr>
<td>Industrial</td>
<td>371,300</td>
<td>Industrial</td>
<td>353,100</td>
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<tr>
<td>Total</td>
<td>2,313,194</td>
<td>Total</td>
<td>2,218,240</td>
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Receiving hauled FOG at Treatment Facility

Grease Problems at the Waste Treatment Facility

- Receiving FOG at the head of the plant
- Clogged pumps
- Clogged transfer lines
- Eating away at the concrete walls of the plant

Anaerobic Digester Transfer Line
Good revenue stream

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<tr>
<th>Month</th>
<th>Fees</th>
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<tr>
<td>Jan</td>
<td>$8,002</td>
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<tr>
<td>Feb</td>
<td>$11,011</td>
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<tr>
<td>Mar</td>
<td>$7,629</td>
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<tr>
<td>Apr</td>
<td>$8,853</td>
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<td>May</td>
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<td>Jun</td>
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<td>Jul</td>
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<td>Aug</td>
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<td>Sep</td>
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<td>Oct</td>
<td>$10,414</td>
</tr>
<tr>
<td>Nov</td>
<td>$10,067</td>
</tr>
<tr>
<td>Dec</td>
<td>$7,900</td>
</tr>
<tr>
<td>Total for the year</td>
<td>$110,323</td>
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Value of FOG

COOKING OIL CONVERSION TO ELECTRICITY BY ANAEROBIC DIGESTION AND IC POWER GENERATION

I KWH = 3412.14 BTU  units conversion only

Cooking oil heating value = 125,000 BTU/gallon = 36.63 KWH  units conversion only
Conventional gas turbine power plant efficiencies are 40% but the starting point is natural gas.

Actual process conversion of heat into electrical energy by anaerobic digestion of cooking oil to methane and IC power generation at an overall efficiency of 22.2% yields 8.13 KWH which, for $.10/KWH, is valued at $0.81/gal.
CWW began a new process

- Thermophillic digestion with plug flow reactors
- Added grease to digesters and boosted methane production
- Methane then used for co-gen of electricity
- Cut plants power usage by 2/3

FOG Partnerships

- Smaller restaurants needed a way to dispose of the grease from their secondary traps
- Apartment Complexes were dealing with private property sewer clogs due to grease
- CWW still had issues in smaller mains in residential areas
- What was the solution?
Grease Recycling Program

- CWW currently has over 90 small restaurants participating
- Over 80 apartment complexes
- 11 residential FOG drop off sites and currently planning 5 more

Columbus Water Works received NAQWA’s National Environmental Award for its FOG Program
CWW and its partners host two recycling events each year

Muscogee County Sheriff's partner for recycling pharmaceuticals

Questions?