SANITARY SEWER OVERFLOW INITIATIVE

City of Fort Worth Case Study

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SANITARY SEWER OVERFLOW INITIATIVE

- System Overview
- Regulatory History
- Fort Worth SSOI Program
- Public Education
Fort Worth System

- Active Wastewater Accounts = 219,355
- Wholesale Wastewater Population Served = 318,519
- Collector Mains (Miles) = 3,059
- Permitted Wastewater Treatment Capacity (MGD) = 166
- Wastewater Treated Daily-Average (MG) = 94.41*

* Includes Wholesale Customers
Regulatory History

• 1989 EPA requests Fort Worth’s plan to address wet weather overflows in the collection system
• 1993 EPA issued Administrative Order (AO)
• 8 years to complete AO requirements
• 1994 Wet Weather Program (WWP) began
• 1996 Water Department begins Preventive Maintenance Program for sanitary sewer collection system
• 2000 EPA closes AO – 1 year ahead of schedule
• Wet Weather Program - $ 215,743,000
• Entered SSOI April 2007
Fort Worth Program

- Fort Worth focused on maintenance, renewal, and replacement of deteriorating and capacity challenged infrastructure

- Fort Worth committed funds for infrastructure rather than penalties

- Team approach
Team Approach

• Engineering
• Field Operations
• Pretreatment
• Public Education
• Regulatory
• Laboratory
• Village Creek WRF
Field Operations Wastewater
Wastewater - General Information

- Wastewater Collection System Operations & Maintenance
- One Facility
- 350 Square Miles Service Area
- 24/7 Operations
- $19.7M Budget, 184/146 Employees
- 23 Wholesale Customer Cities
- Over 1.1 Million Customers
Wastewater Collection System

- 3,059 miles
- 1 ¼” - 108” (Gravity/Force)
- 9 Major Basins
- 167 Sub-Basins
- 53,783 Manholes and junction chambers
- 14,198 work orders/yr.
Repeat Offenders

- Team Effort
- Easements Clearing
- Responsive First Responders
- CCTV Follow-Ups
- Repairing Problems
- Recommendations
- Additional Programs
Wastewater Sections
184/146 10 Sections

- 30 - Sewer Mains
- 30 - Sewer Taps & Services
- 13 - Sewer Asset Management (SAM)
- 37 - Sewer Stops (SERI Sewer Emergency Response Investigators)
- 36 - Preventative Maintenance (Cleaning and CCTV)

- 11 - Warehouse (Support)
- 11 - Dispatch (Support)
- 04 - Earthfill (Support)
- 07 - Administrative Services (Support)
- 03 - Training (Support)
Sewer Asset Management

- Maintenance of our large diameter lines
- Aerial and creek crossings
- Odor control /corrosion devises
- Sanitary sewer easements
- Emergency by-pass pumping support
- Field investigations
- Manhole rehabilitation activities
- Assist neighboring cities, and many other duties.
Monitoring Equipment

LOCATIONS
1420 Elva Warren ID 26929
1604 Rogers Rd ID 10592
2104 Stratford Park ID 32211
2201 Burleson Retta Rd ID 46392
2600 Cherry Ln ID 20120
CRITICAL 5317 Mansfield Hwy ID 22442
CRITICAL 1600 Cooks Ln ID 5911
CRITICAL 209 W 8th St ID 22442
CRITICAL 4370 Sahara Pl ID 446
CRITICAL 6300 Randol Mill Rd ID 22442
CRITICAL 6400 Overton Ridge ID 1777
Lake Country Golf Course ID 1777
Sewer Stops
(First Responders)

- Respond to customer concerns and complaints
- First Responder to all sewer system back-ups, flooded homes and businesses due concerning wastewater.
- Trace out service lateral and locate city side clean outs
- Routine degrease, root-cut and manhole inspections
Preventative Maintenance
CCTV Inspection

• Televise Immediately After Overflow Or Stop Is Controlled
• Determine Cause
<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Structural failure has occurred and/or line has collapsed. Pipe has deteriorated beyond the ability to make intermediate repairs. Replace/rehabilitate immediately.</td>
</tr>
<tr>
<td>4</td>
<td>Structural failure identified failure imminent and/or partial collapse exist. Spot repairs difficult due to condition/deterioration/age. However pipe could possibly be maintained for 12 to 24 months +/-</td>
</tr>
<tr>
<td>3</td>
<td>Pipe is in poor condition. Major structural defects observed. Estimated time before failure 2-6 years +/-</td>
</tr>
<tr>
<td>2</td>
<td>Pipe is in fair condition with minor to moderate structural defects documented. Estimated time before failure 6 - 10 years +/-</td>
</tr>
<tr>
<td>1</td>
<td>Pipe in good/excellent condition. Estimated time before failure greater than 10 years.</td>
</tr>
</tbody>
</table>
Sewer Mains

- Repair leaks and breaks
- In-House replacements
- Repair, rebuild, replace and adjust existing manholes
Sewer Taps & Services

- Repair, replace/renew and/or adjust existing services
  - (Long and Short Side Services)
- Install new taps, cleanouts, services and manholes
Preventative Maintenance Cleaning

• Cleaning
• Clean sewer lines of entire collection system on a pre-defined cycle (At present trying to clean entire system in 10 Year cycle)
Collection System Debris

MATERIAL REMOVED IN CUBIC YARD IN LAST 5 YEARS

FY - 11: 837
FY - 12: 414
FY - 13: 635
FY - 14: 665
FY - 15: 549

MATERIAL REMOVED
Preventative Maintenance

Business Plan Goals each Fiscal Year

- Cleaning Goal 1.5M Linear Feet
- CCTV Goal 1.5M Linear Feet

<table>
<thead>
<tr>
<th>PM Section</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sewer Cleaning (LF)</strong></td>
<td>1,722,969</td>
<td>1,415,580</td>
<td>1,727,816</td>
<td>1,641,863</td>
<td>1,510,775</td>
</tr>
<tr>
<td><strong>Sewer CCTV inspections (LF)</strong></td>
<td>1,703,394</td>
<td>1,522,724</td>
<td>1,580,236</td>
<td>1,531,533</td>
<td>1,577,817</td>
</tr>
</tbody>
</table>
## Root Causes

<table>
<thead>
<tr>
<th>Main Cause of Overflow</th>
<th>FY 10-11</th>
<th>FY 11-12</th>
<th>FY 12-13</th>
<th>FY 13-14</th>
<th>FY 14-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overflow due to debris build-up in line</td>
<td>243</td>
<td>127</td>
<td>114</td>
<td>134</td>
<td>100</td>
</tr>
<tr>
<td>Overflow due to grease build-up in line</td>
<td>161</td>
<td>119</td>
<td>127</td>
<td>90</td>
<td>76</td>
</tr>
<tr>
<td>Overflow due to heavy rain</td>
<td>2</td>
<td>67</td>
<td>0</td>
<td>0</td>
<td>56</td>
</tr>
<tr>
<td>Overflow due to roots in line</td>
<td>34</td>
<td>25</td>
<td>23</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Overflow due to structural failure</td>
<td>13</td>
<td>16</td>
<td>7</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Total Overflows (From Oct. 1 – to Sept. 30 of Next Year)</td>
<td>459</td>
<td>359</td>
<td>277</td>
<td>254</td>
<td>259/214</td>
</tr>
<tr>
<td></td>
<td>-18%</td>
<td>-22%</td>
<td>-23%</td>
<td>-9%</td>
<td>-16%</td>
</tr>
</tbody>
</table>
Fort Worth Sanitary Sewer Overflows per 100 Miles of Collection System Piping

GOAL = 3.0 to 4.5 SSO PER 100 MILES
Hazards

- Raw sewage
- Diseases
- Children, the elderly, and people with suppressed immune systems
- When SSOs contaminate public places and waters of the U.S.
Additional Steps

• Sandbagging all overflows
  – Directing flows in specific areas

• Posting Caution Signs
  – Avoid citizens, animals, kids, etc.

• Flow Estimation Chart
  – Calculate overflow rates
Flow Estimation Chart

Flow Estimation Pictures

- 5 gpm
- 25 gpm
- 50 gpm
- 100 gpm
- 150 gpm
- 200 gpm
- 225 gpm
- 250 gpm
- 275 gpm
2015 Wettest Year Ever…

Year - 59.49” * May - 16.96” * November - 9.86”
Sanitary Sewer Overflow
Standard Operating Procedures

Sanitary Sewer Overflow (SSO) Response Procedure
• Introduction (Intent and Responsibilities)
• Reporting Responsibilities
• Normal SSO Reporting Procedures
• Reporting Schedules
• Internal Procedures and Notification
• Severe Rain Event Reporting

Appendix
• Notice of Spill from a Wastewater Facility
• Important Contact Information
• Water Quality Noncompliance Notification
• Flow Estimation Chart
• Public Education Coordinator Process
• TCEQ Chapter 319
Magnificent Seven

1. Wastewater Master Plan
2. Sewer Asset Management
3. First Responders
4. PM / ICAP (Data)
5. Root Eradication
6. Repairs and Renewals (CIP)
7. FOG
Team Effort Results

1. Wastewater Master Plan - Future
2. SAM - Clearing and Maintaining Access (Maintaining our easement for access purpose)
3. STOPS - Clearing Blockages (Stops – Stopped up lines are potential for SSO in future if not clean)
4. PM / ICAP – Cleaning & CCTV Inspection (Condition assessment & evaluating root cause of SSO as well as life expectancy of sewer lines)
5. Root Eradication – Eliminate the source of roots
6. SMAIN/SSERV - Fixing Root Causes with repairs or In-House Relay projects
7. Pre-Treatment Services - FOG
Motivation
Some need more than others!!!
• Bill inserts
• Bill messages
• Booths at events
• Partner with North Central Texas Council of Governments through FOG initiative

2014 Holiday Grease Roundup Dec. 6-13

Don’t pour your Thanksgiving grease down the drain. Recycle it instead!

Learn more at www.ceasethegreasentx.com.
Just as fat, oil and grease can cause blockages in your arteries, they can do the same to sewer pipes.

Garbage disposals and detergents that dissolve grease may just pass the problem down the pipe.

Grease comes from meat, salad dressing, butter, margarine, shortening, cooking oils, lard, dairy products, baked goods, food scraps and many other common delights.

Call us first
If you do experience a sewer back up in your home, call the Fort Worth Water Department before calling a plumber.
817-392-4477
A crew will make sure the blockage is not in the city-owned sewer main. You will be notified of what is found and whether you need to call a plumber.

Ways you can help

✓ Always use a paper towel or spatula to thoroughly scrape food scraps and residue from plates and pans into the garbage before washing.

✓ Let melted oils used for cooking solidify in a container on the counter or in the refrigerator.

✓ Take all used solid and liquid cooking oil to the free Environmental Collection Center. Used grease can be recycled into other products. For information, call 817-392-1234.

✗ Never pour oil and grease down the sink or any household drain.

✗ Never pour oil and grease down a storm drain.
Public Notification
Public Notification

- TAC Chapter 319 - General Regulations Incorporated Into Permits
- **Subchapter C: Public Notice Of Spills Or Accidental Discharges From Wastewater Facilities Owned Or Operated By Local Governments**
- 319.301 - 319.303
- Originally Effective - Dec. 30, 1999
- Revisions Effective - March 31, 2011
????? Questions ????