

FOOG CHRONICLES

NACWA, May, 2012

Clayton Brown
Source Control Manager

Top FOG Issues

- **Maintenance and cost**
 - Treating FOG at wastewater plants
 - Cleaning FOG buildup in collection system
 - FSE inspections
- **Sanitary sewer overflows (SSOs)**
 - EPA and DEQ have zero tolerance for SSOs
 - FOG causes blockages that result in SSOs



Scope and Magnitude

- 1,700 FSEs in Clean Water Services area
- Population 530,000
- About 90% FOG generated by FSEs
 - Most FOG is discharged to public system
 - Resource recovery estimates (Kennedy/Jenks “Brown Grease Study”)
- About 10% FOG generated by residential & industrial sources
- 28.4 miles of FOG lines need extra cleaning



FOG Cleaning Schedule

The map displays the following areas and their cleaning schedules:

- Quarterly Cleaning (Red):** Banks, North Plains, Forest Grove, Cornelius, Hillsboro, Gaston, Sherwood, and parts of Beaverton, Tigard, and Tualatin.
- Semi-Annual Cleaning (Yellow):** Hillsboro, Beaverton, Tigard, Tualatin, and parts of Forest Grove, Cornelius, and Sherwood.
- Annual Cleaning (Green):** Forest Grove, Cornelius, Beaverton, Tigard, and parts of Hillsboro and Tualatin.

The map also shows major roads and neighboring cities like Portland and Lake Oswego.

\$4.2 M = Annual cost of FOG



Wastewater treatment

\$3,500,000

- Diminished treatment capacity
- Uses more energy and chemicals



Maintenance

\$ 371,000

- Collection system \$168,000 (includes cities)
- Pump Stations \$117,000
- Treatment plants \$ 86,000



FSE Oversight

\$ 362,000

- Inspections \$252,000 (includes cities)
- Public Affairs \$ 16,000
- Administration \$ 94,000

Total \$ 4,233,000

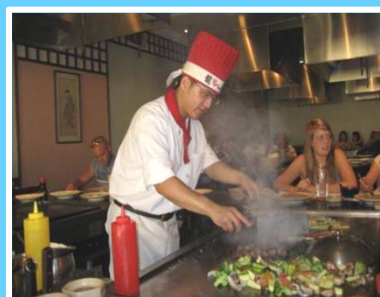
FOG is from food preparation



- Residential/
multi-family



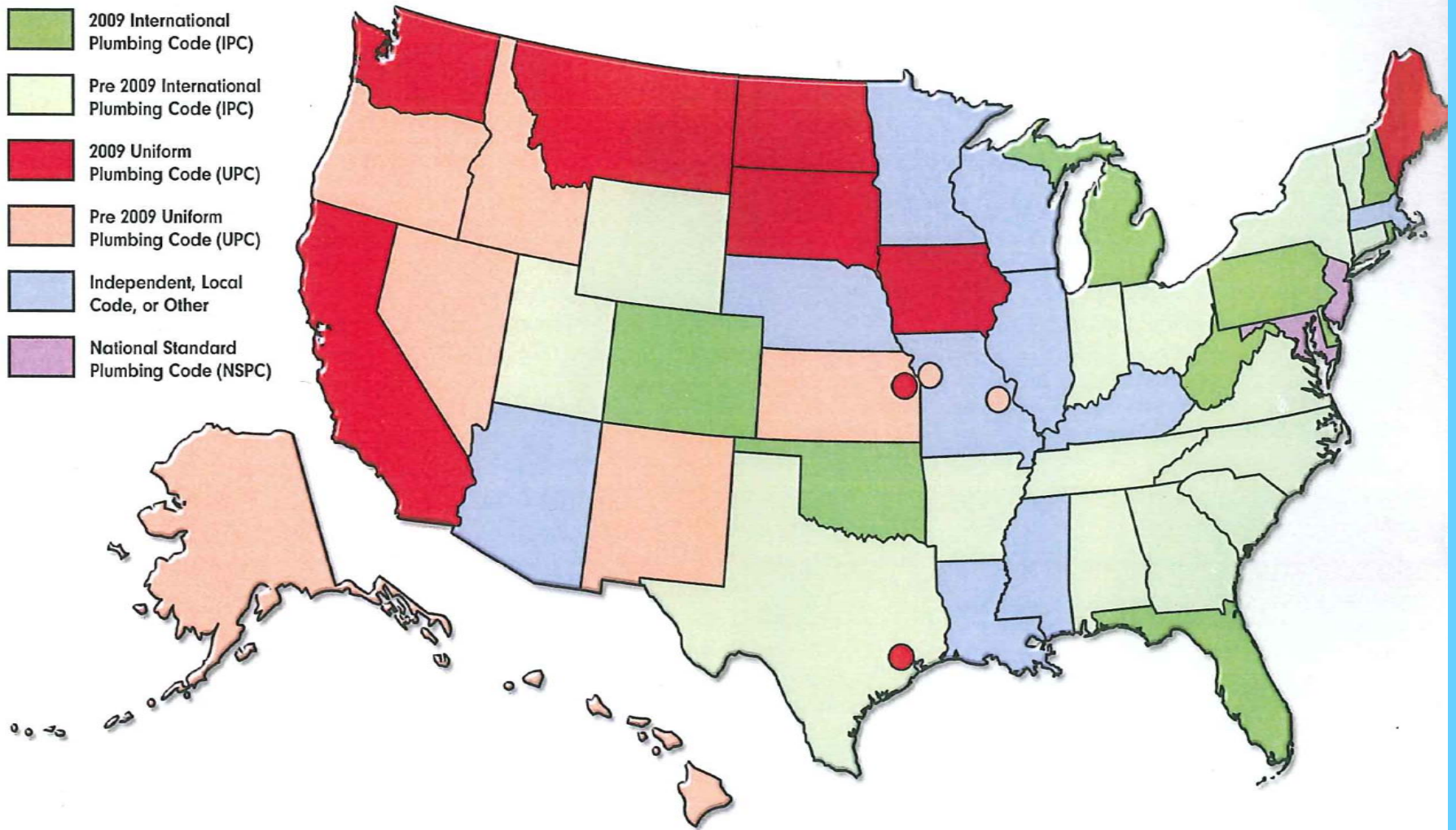
- Industrial food
processing/
packaging



- Food Service
Establishments
(FSEs)

**FSEs: restaurants,
taverns, clubs, coffee
shops, groceries, deli's,
commissaries, care
facilities, churches,
schools, hospitals, etc.*

- 2009 International Plumbing Code (IPC)
- Pre 2009 International Plumbing Code (IPC)
- 2009 Uniform Plumbing Code (UPC)
- Pre 2009 Uniform Plumbing Code (UPC)
- Independent, Local Code, or Other
- National Standard Plumbing Code (NSPC)



Types of GRDs

- **Inside
Hydro-mechanical**
- **Outside
Interceptor vaults**



BMP Effectiveness?

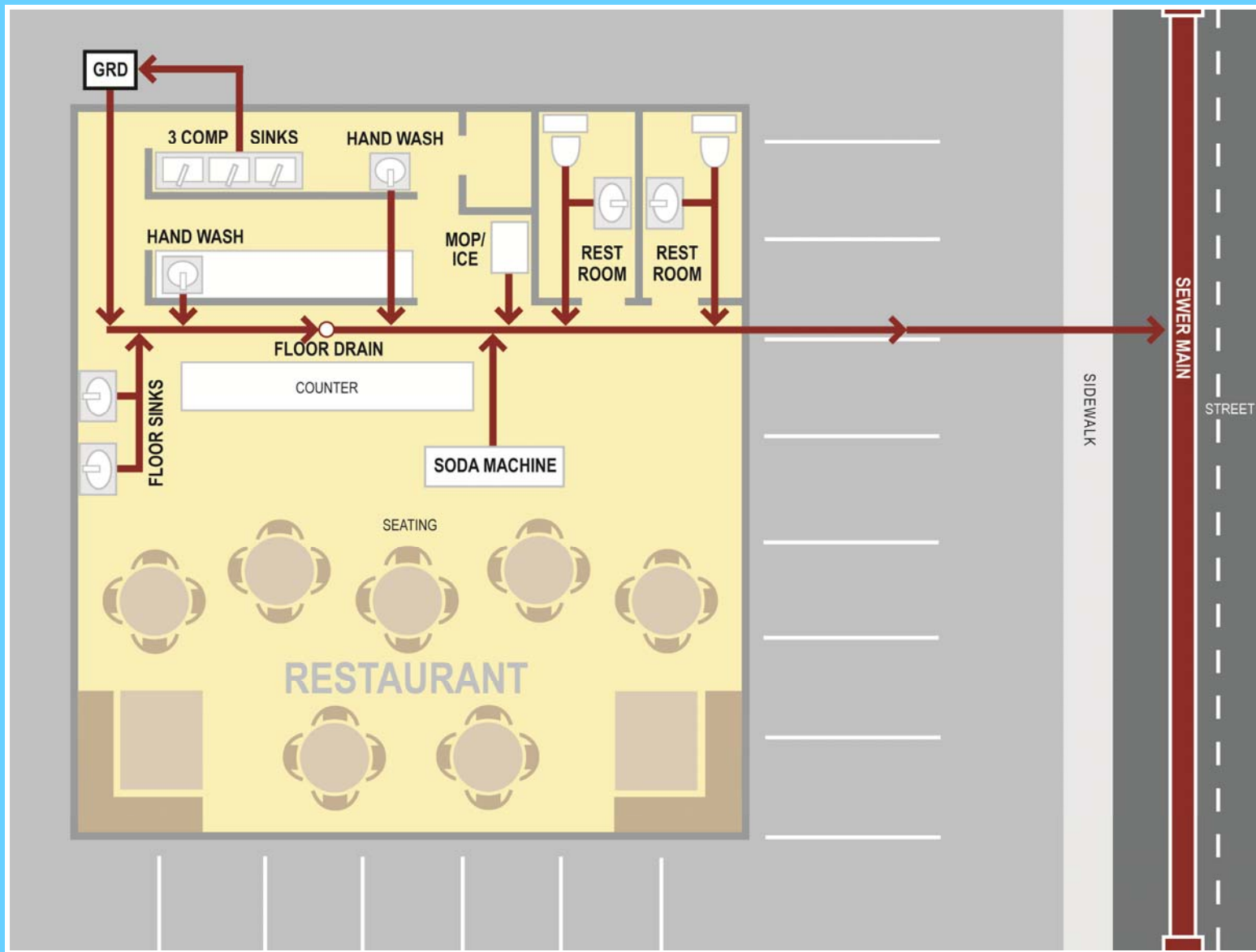
- Despite inspections, and training on kitchen BMPs and GRD maintenance . . .
- Just 3 months after line cleaning we found:
 - **FOG buildup at FSE connections**
 - **Restrictions in the pipe (FOG on top of pipe indicates blockage)**



What we find at FSEs

- **No GRDs**
- **Not all drains are connected to GRDs**
- **Poorly maintained GRDs**
- **Difficult access to clean and inspect GRDs**
- **GRD not right for the business**
- **Size vs. maintenance not cost effective**
- **Use of prohibited emulsifiers, chemicals**



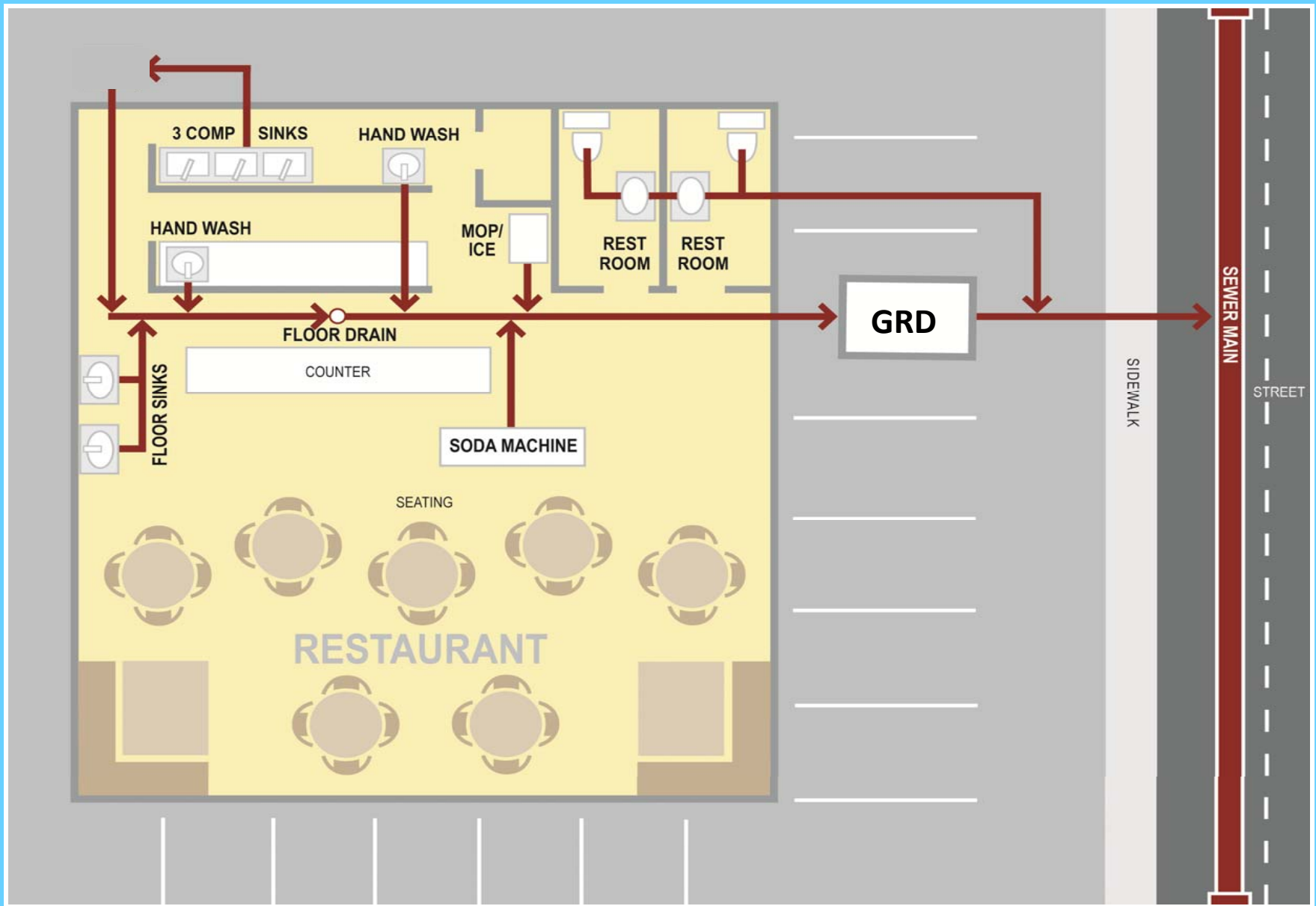


Case Studies #1 and #2

Status	GRD Size	Connections	Lbs FOG per year	Cleaning frequency	Cleaning cost/year	More FOG captured
<i>Pub</i>						
Approved	HGI 20/40	3-comp sink	640	90 days	\$320	
Mfg Spec	HGI 20/40	All FOG	8,891	1.6 days	\$17,500	1290% 8,251 lbs
Updated	GB 75	All FOG drains	8,891	21 days	\$3,315	1290% 8,251 lbs
<i>Hospital</i>						
Approved	HGI 20/40	3-comp sink	1,920	30 days	Self	
Mfg Spec	HGI 20/40	All FOG	35,337	0.4 days	\$69,700	1740% 33,417 lbs
Updated	3 GB 75	All FOG drains	35,337	73 days	\$3,300	1740% 33,417 lbs

Case Studies #3 and #4

Status	GRD Size	Connections	Lbs FOG per year	Cleaning frequency	Cleaning cost/year	More FOG captured
<i>Mexican</i>						
Approved	HGI 20/40	3-comp sink	1,920	30 days	Self	
Mfg Spec	HGI 20/40	All FOG	12,900	0.9 days	\$24,400	571% 10,980 lbs
Updated	GB 259	All FOG drains	12,900	29 days	\$2,281	571% 10,980 lbs
<i>Chinese</i>						
Approved	2 HGI 20/40	3-comp sink	3,840	30.5 days	Self	
Mfg Spec	2 HGI 20/40	All FOG	16,956	1.7 days	\$16,700	341% 13,116 lbs
Updated	GB 250	All FOG drains	16,956	20 days	\$2,500	341% 13,116 lbs



Plumbing determines COSTS

Current

Fixtures/Drains with FOG Protection

- Wok HGI 20/40
- 3 comp & Mop sink HGI 20/40
- Prewash sink HGI 20/40

Fixtures/Drains without Protection

- Dishwasher
- 2 compartment sink
- 2 hand wash sinks (one used to dump)
- 3 Floor sinks
- 2 Floor drains

Current practices:

\$895.99 / month or \$10,740.00 / year

If added proper training and strict staff BMPs:

\$485.00 / month or \$5,820.00 / year

City & CWS is processing this FOG

All Drains Connected

Option 1

- New design HGI
- \$220.00 / month
- \$2,640.00 / year

Option 2

- GGI (1,900 gal)
- \$450.00 every 5 or 6 months
- \$1,080.00 / year

Pumper Prices

HGIs 1 = \$95.00, 2 = \$120.00, 3 = \$175.00

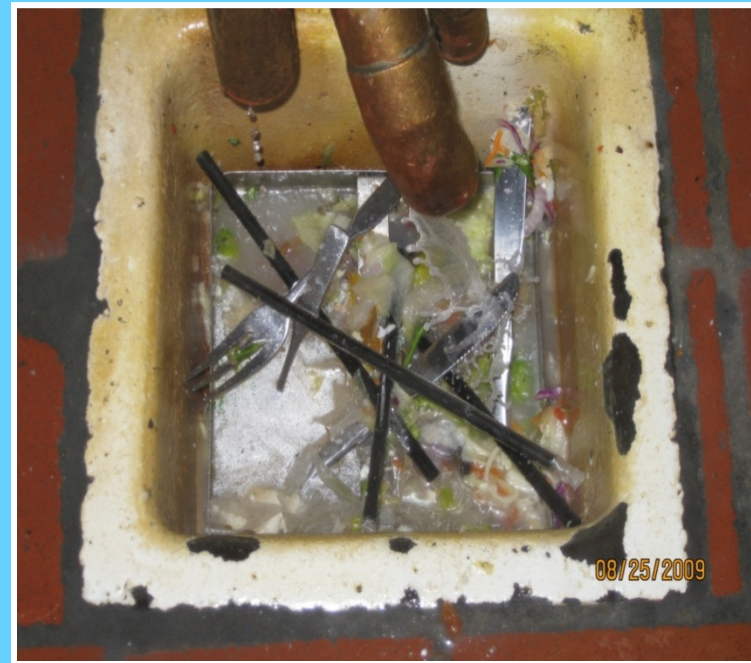
GGIs 0.25 – 0.28 per gallon

Return on Investment

Floor Drains Impacted



More drains to be connected



Retrofits vs. New Construction



Stormwater impacts



Is there a better way?



Doing the right thing



Questions?

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