



Colorado Springs Utilities  
*It's how we're all connected*

# FOG Investigations

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General Photo  
GREASE BALL AT END OF STUB

27.9 ft.

# Agenda

1. Greetings
2. Sharing the wealth
3. Partners in crime
4. 400+ PPM Hydrogen Sulfide
5. Questions

# Share the wealth!

**Include your team!**

**You never know when you'll win the lottery and need someone to take your place.**

**A second set of eyes can make all the difference.**

Pictured: Bob Bowren, Ashley Hanel, Sara, Yakuba, Scott Caldwell, Kirsten Aires, Tabitha Kling



# Partners in crime...

- El Paso County Health Department – Cooperated on several restaurant inspections. They see every FSE that opens when IPT may not. The inspectors will call when they run into anything unusual or need some help.
- Utilities Development Services – Engineering department with utilities that oversees all submitted plans.
- Pikes Peak Regional Building and Development – Dedicated plumbing approver who calls me anytime something looks strange.

# Getting Cooperation

- Once you've identified the source, making a connection to the business and the owner. Explaining safety of the WW crews, downstream backups and effects on the surrounding business or residential areas.
- A small business that's been running since the 1960's with no GT or GI.
- A medium sized restaurant that has an undersized GI but is struggling financially.
- A large retail warehouse that needs to decrease their service interval.

# The Liquid Waste Hauler – the good guys.

- Eyes and ears for an IPT program that cannot random inspect as often as it would like. Try and have a professional, but close relationship with these owner/operators.
- Customers that won't let them clean as often as recommended.
- Call when they're starting a new customer to get information on the interceptor size.

However,

Many interceptors are cleaned when no one is at the restaurant. A less than honest operator can skim the interceptor without cleaning the bottom sludge. Overtime, the interceptor can be greater than 20 percent full after a skimming just because the bottom sludge is never removed.

# Restaurant Owners

- Educate individual restaurant owners as to what you require from the LWH's when they service an interceptor.
- When you find one that's in question, call the LWH and have them meet you on site with the restaurant owner present. Again, having a relationship with the LWH owner is helpful.
- A presentation at a restaurant owners association meeting will generate several conversations and opportunities.



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# Case Study

400+ PPM Hydrogen Sulfide



# Timeline of Events

**Reports of odor in the area and inside several businesses starting in 2017.**

**Utilities Wastewater Engineering staff began evaluation of main line using OdaLog instruments and found higher than usual H<sub>2</sub>S readings and a noticeable above-ground odor at times during the year.**

**A section of the main service line was found to be sagging causing a low spot allowing accumulation of gasses.**

**Utilities performed repairs to the main wastewater line over the next several years to attempt to improve the situation.**

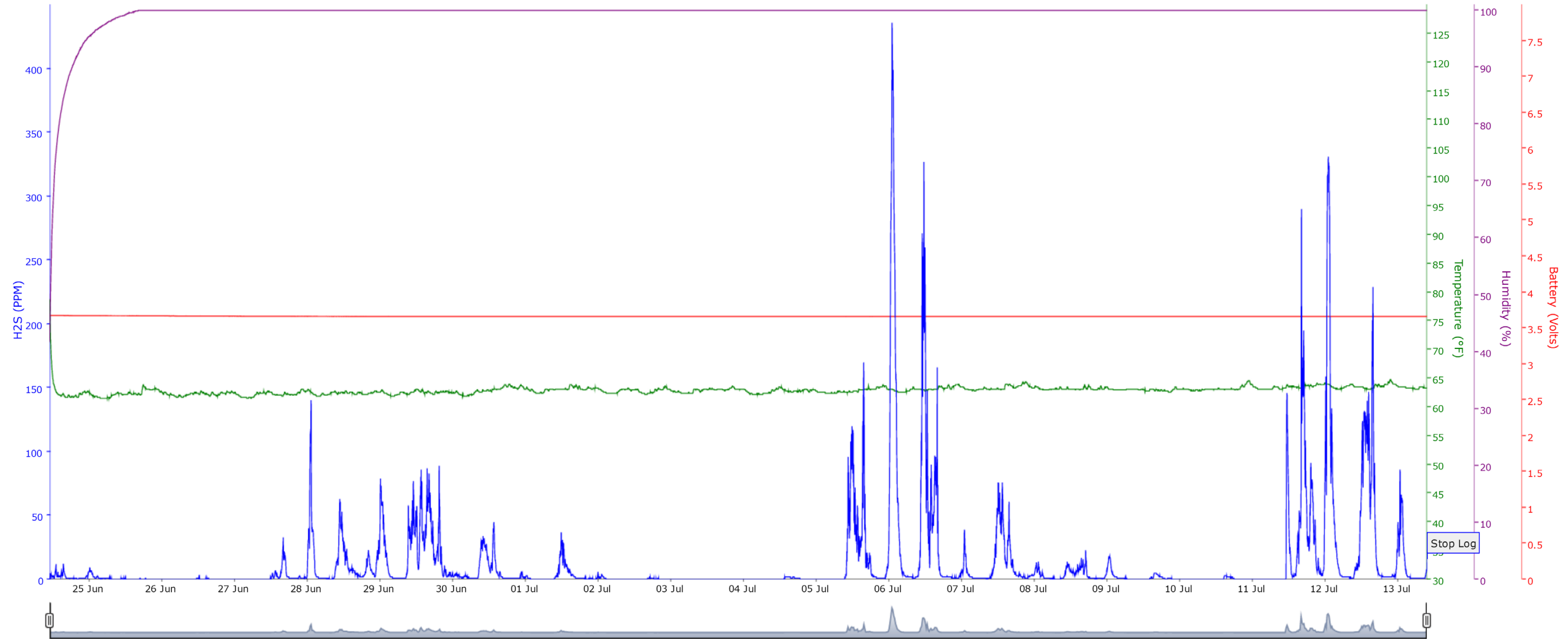
**Utilities Engineering also visited the businesses in the area and identified plumbing defects and unused drains using smoke tests that were allowing odor to infiltrate buildings.**

**But the higher level of H<sub>2</sub>S remained in the line.**

H2S (PPM)  Temperature (°F)  Humidity (%)  Battery (Volts)

[6/24/2022, 11:12:57 AM --- 7/13/2022, 9:54:57 AM] [H2S-200602841]

### H2S-200602841



Average: 11.57 PPM; Minimum: 0 PPM; Maximum: 436 PPM [6/24/2022, 11:12:57 AM --- 7/13/2022, 9:54:57 AM]

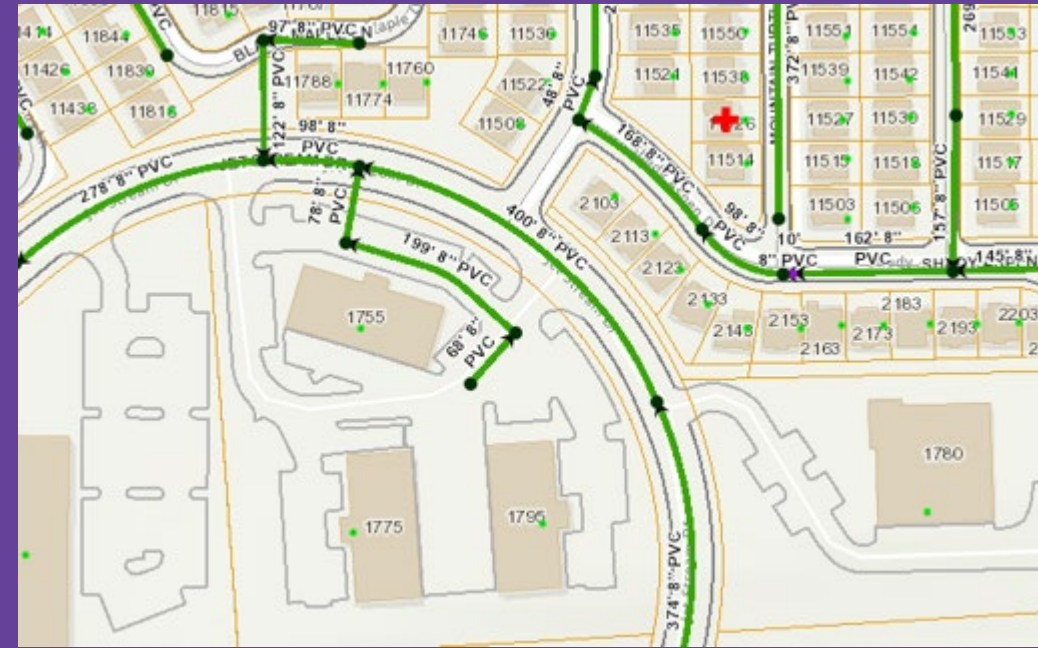
## **Utilities Engineering reached out to Industrial Pretreatment for help in June of 2022.**

**Using OdaLog data and GIS, pretreatment was able to identify an upstream business as a likely source however no indication in the billing indicating a business that would likely produce the waste stream.**

**As a four-service utility, pretreatment has access to new customer account starts, billing and use of utilities.**

**Pretreatment has a robust survey program that uses billing information that would identify potential industrial users through the business description or use of water more than 25k per day. A survey is generated once these are identified, and site visits could occur if more information was needed.**

**However, the identified business had been started under an account the owners previously used for a religious literature warehouse operation. It never showed up in the billing account as a meat roasting and smoking operation.**



**Pretreatment Specialists inspected the business in June of 2022 (the FOG guy was out on vacation). Finding the type of operation within, a Verbal Notice of Violation was issued requiring the business to take steps to reduce the H<sub>2</sub>S entering the POTW and submit an industrial survey.**

**The business, who was and has remained very cooperative immediately began servicing their 5000-gallon interceptor weekly in an attempt to control the formulation of H<sub>2</sub>S gasses in addition to adding a chemical auto feeding “binder” to control the release of the gas.**

**These steps seemed to help but not eliminate the problem.**

**Industrial pretreatment continued to investigate and reviewed the original 2017 plans from Regional Building.**

# PLUMBING FIXTURE SCHEDULE

MARK	DESCRIPTION	MINIMUM SIZES (IN)			
		WASTE	VENT	CW	HW
WC1	WATER CLOSET B.O.A. COMBINED EQUAL TO SCHLER MODEL# F-2004 FLOOR MOUNTED, FLUSH TRNK TYPE TOILET, 1.60 GPF, WHITE, VITREOUS CHINA WITH ENLARGED BOWL. PROVIDE OPEN FRONT SEAT LEGS COVER, SEAT COVERS AND ASSE SUPPLY WITH STOP. SEAT HEIGHT BETWEEN 17" AND 19" A.F.F. FOR A.D.A. COMPLIANCE.	2"	2"	2"	-
WC2	WATER CLOSET EQUAL TO SCHLER MODEL# F-2004 4 OVAL, VITREOUS CHINA, DROP-IN BOWL, 4" COVERS, FAUCET EQUAL TO KOHLER MODEL# K-10583-107, 0.8 GPM VITREOUS RESISTANT ADA COMPLIANT. PROVIDE GRON GRID STRAINER W/ CRIBST. TAILPIECE, CASTIRON 1/2" TRAP, TRAP ARM & 1/2" FLEX. SUPPLIES WITH STOPS. SECURE HOLD-DOWN TO WALL STRUCTURE. INSTALLS EXPOSED DRAIN AND HOT WATER PIPING. MAXIMUM HOT WATER OUTLET TEMPERATURE TO PUBLIC LAVATORIES TO BE 110° PER 2011 INTERNATIONAL ENERGY CODE. PROVIDE MIXING VALVE EQUAL TO WATTS SERIES RM-AUT-#1.	1 1/2"	1 1/2"	1 1/2"	1 1/2"
WH1	WATER HEATER EQUAL TO WHEISSER MODEL# QH-1005-400AL, 388 B BSH GAS INLET, 450 GPH RECOVERY @ 120°F RISE @ SEA LEVEL. PROVIDE ASSE RATE TAP RELIEF VALVE PIPED TO SILL, HOT WATER TEMPERATURE FOR 140°F MAXIMUM OUTPUT.	-	-	1"	1"
CD1	CIRCULATING PUMP EQUAL TO BELL + HOWITT MODEL# RFP ALL BRONZE RECIRCULATING DOMESTIC HOT WATER PUMP, 1/2 HP, 115VAC PHASE. PROVIDE TO-1 AUTOMATIC TIMER KIT AND ASSE ADJUSTAT.	-	-	-	1"
ED1	EMERGENCY TANK FOR USE WITH WH-1 EQUAL TO ARI VCL, VOL. 21.5 OR EQUIV. RATED FOR USE IN DOMESTIC WATER SYSTEMS. THE UNIT IS TO BE INDEPENDENTLY SUPPORTED. SUPPORT FROM ANY PIPING SYSTEM IS NOT ACCEPTABLE.	-	-	1"	-
ST1	STORAGE TANK FOR USE WITH WH-1 EQUAL TO BARRI MODEL# ST100X RATED FOR USE IN DOMESTIC WATER SYSTEMS.	-	-	1"	1"
K1	KITCHEN SINK B.O.A. COMB. W/ST EQUAL TO SCHLER MODEL# K-2004-3 SELF DRAINING STAINLESS STEEL COUNTERTOP SINK, 32 1/2" X 22 1/2" X 16 1/2" DOUBLE COMPARTMENT SINGLE LEVER GOOSENECK FAUCET EQUAL TO KOHLER MODEL# K-1911-FL. PROVIDE CRUMB CUP STRAINER, P-TRAP, 1/2" SUPPLIES AND STOPS. PROVIDE GARBAGE DISPOSAL EQUAL TO INSURATOR BODGER 1, 120VAC, 10 HP.	2"	1 1/2"	1 1/2"	1 1/2"
WC3	BILL FLOOR CUP EQUAL TO JET R SMITH MODEL# 4710, STAINLESS STEEL, SHALLOW COVER OR CHROME PLATED BRONZE DEEP COVER WITH CENTER BOW AS INDICATED BY FINISH NUMBER SELECTED.	SEE PLAN	-	-	-
CD2	FLOOR CLEAN OUT EQUAL TO JET R SMITH MODEL# 4143, DUCT CAST IRON CLEANOUT WITH ROUND ADJUSTABLE SECURED NICKEL BRONZE TOP WITH 1/4" TIE RODS. BRONZE PLUG WITH GASKET SEAL, CLOSURE PLUG TYPE.	SEE PLAN	-	-	-
ED2	EMERGENCY FLOOR DRAIN EQUAL TO JET R SMITH MODEL# 3008A, CAST IRON BODY, NICKEL-BRONZE STRAINER. PROVIDE CAST IRON P-TRAP. PROVIDE TRAP GUARD EQUAL TO PROJECT.	SEE PLAN	2"	-	-
ED3	FLOOR SINK (DUAL GRATE) EQUAL TO JET R SMITH MODEL# 3007Y, CAST IRON PLANGED RECEPTOR WITH SEEPAGE HOLES, ACID RESISTANT COATED INTERIOR, NICKEL BRONZE RIM AND SECURED GRATE, ALUMINUM DOME BOTTOM STRAINER. PROVIDE CAST IRON P-TRAP. PROVIDE TRAP GUARD EQUAL TO PROJECT.	SEE PLAN	2"	-	-
ED4	FLOOR SINK (SINGLE GRATE) EQUAL TO JET R SMITH MODEL# 3007Y-12, CAST IRON PLANGED RECEPTOR WITH SEEPAGE HOLES, ACID RESISTANT COATED INTERIOR, NICKEL BRONZE RIM AND SECURED GRATE, ALUMINUM DOME BOTTOM STRAINER. PROVIDE CAST IRON P-TRAP. PROVIDE TRAP GUARD EQUAL TO PROJECT.	SEE PLAN	2"	-	-
MB1	MOP BASKET EQUAL TO THAT ABOVE MOP BASKET, FLOOR DRAIN, 24" X 24" MOLDED STONE BASIN, 3" DRAIN BODY, WALL MOUNTED SERVICE SINK, FAUCET W/ WHITE BRASS HANDLES, INTEGRAL STOPS, VACUUM BREAKER, WALL BRACKET, HOSE AND CONNECTION.	2"	1 1/2"	1 1/2"	1 1/2"

# GREASE INTERCEPTOR SIZING

**A. DETERMINE MAXIMUM DRAINAGE FLOW FROM FIXTURES:**

TYPE OF FIXTURE	FLOW RATE	AMOUNT	TOTAL
MOP SINK OR HAND SINK	15	8	120
SINGLE COMPARTMENT SINK	20	8	160
DOUBLE COMPARTMENT SINK	25	2	50
DISPOSAL	15	0	0
TRIPLE COMPARTMENT SINK	35	1	35
DISHWASHER (2-30 GAL.)	15	0	0
DISHWASHER (30-50 GAL.)	25	0	0
DISHWASHER (50-100 GAL.)	45	1	45
<b>B. TOTAL FLOW RATE</b>		<b>8</b>	<b>345</b>

**C. LOADING FACTORS**

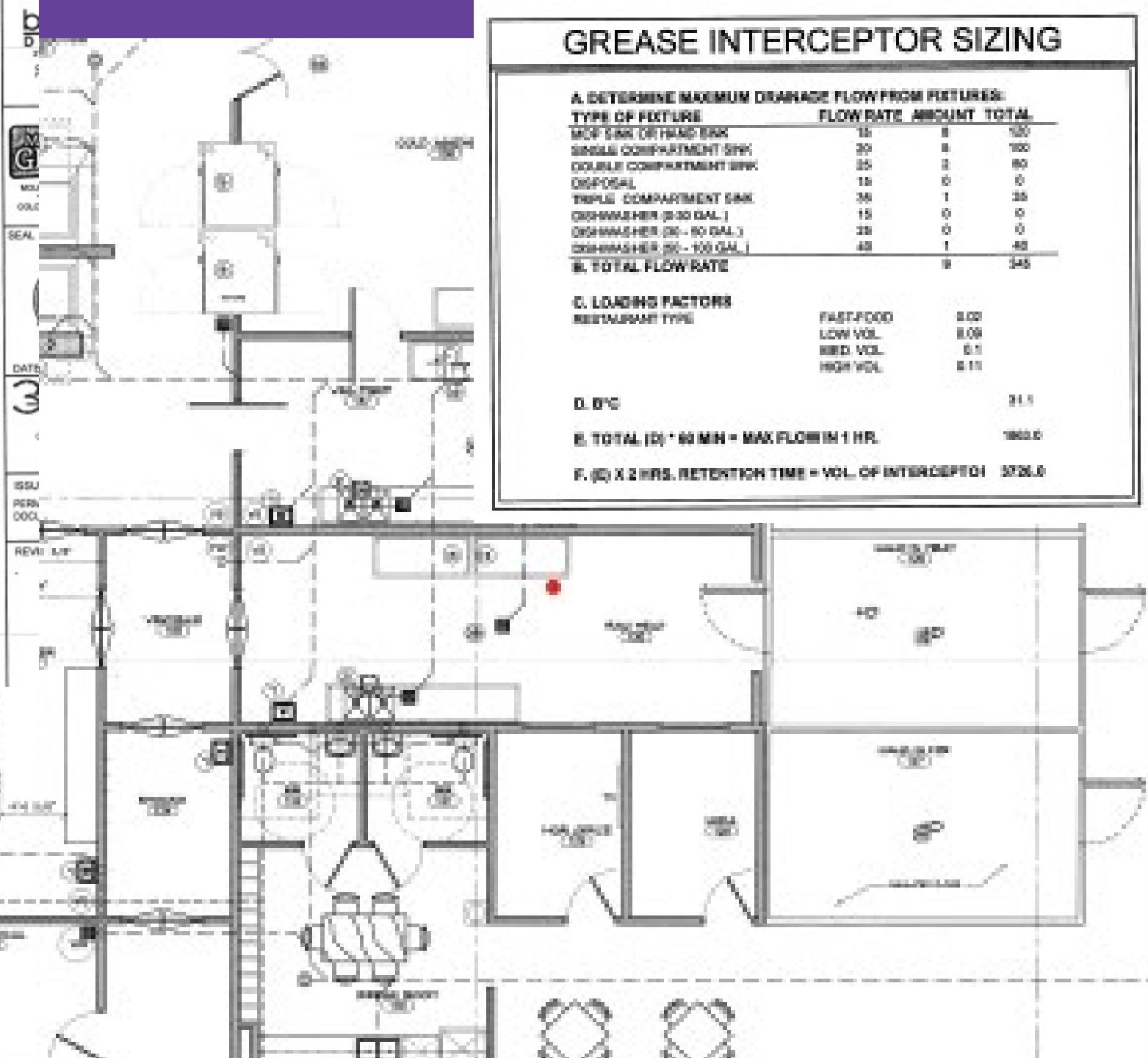
RESTAURANT TYPE	FAST-FOOD	LOW VOL.	MED. VOL.	HIGH VOL.
	0.03	0.08	0.1	0.15

**D. DFC** 21.5

**E. TOTAL (D) \* 60 MIN = MAX FLOW IN 1 HR.** 1890.0

**F. (E) X 2 HRS. RETENTION TIME = VOL. OF INTERCEPTOR** 3780.0



## PLUMB MATERIALS SCHEDULE

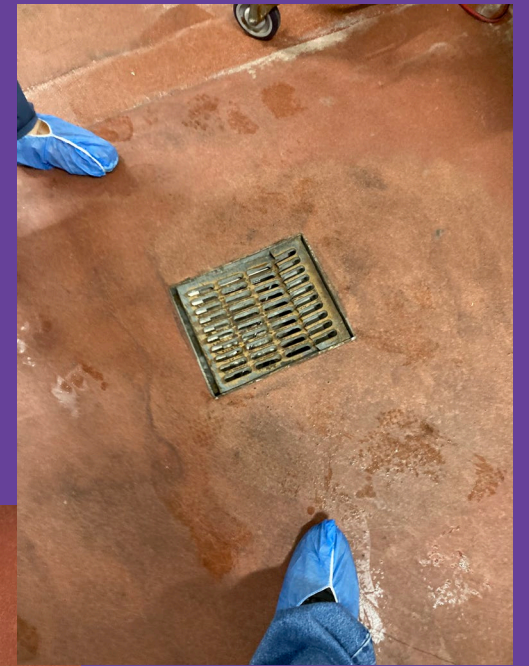
## PLUMBING SYMBOLS LEGEND

**The original plans showed several trench drains within the facility along with numerous drain fixture units and standard floor drains.**

**It was found that the trench drains had not been calculated into total wastewater volume used to size the interceptor. This was an error on the part of the plumbing designer and was also not caught by the building development regulatory groups.**

**A second IPT inspection of the facility occurred in August 2022 where it was noted that just about all the drains had their internal screens removed at some time since installation. IPT conducted several inspections of the weekly service to the interceptor which were occurring at 4:00AM and found large amounts of meat solids within the interceptor with even chunks of metal that had been washed down during the cleaning operations and were not contained due to lack of screens.**

**A second Notice of Violation was issued to have all the drain fixture screens replaced which was accomplished within two weeks.**

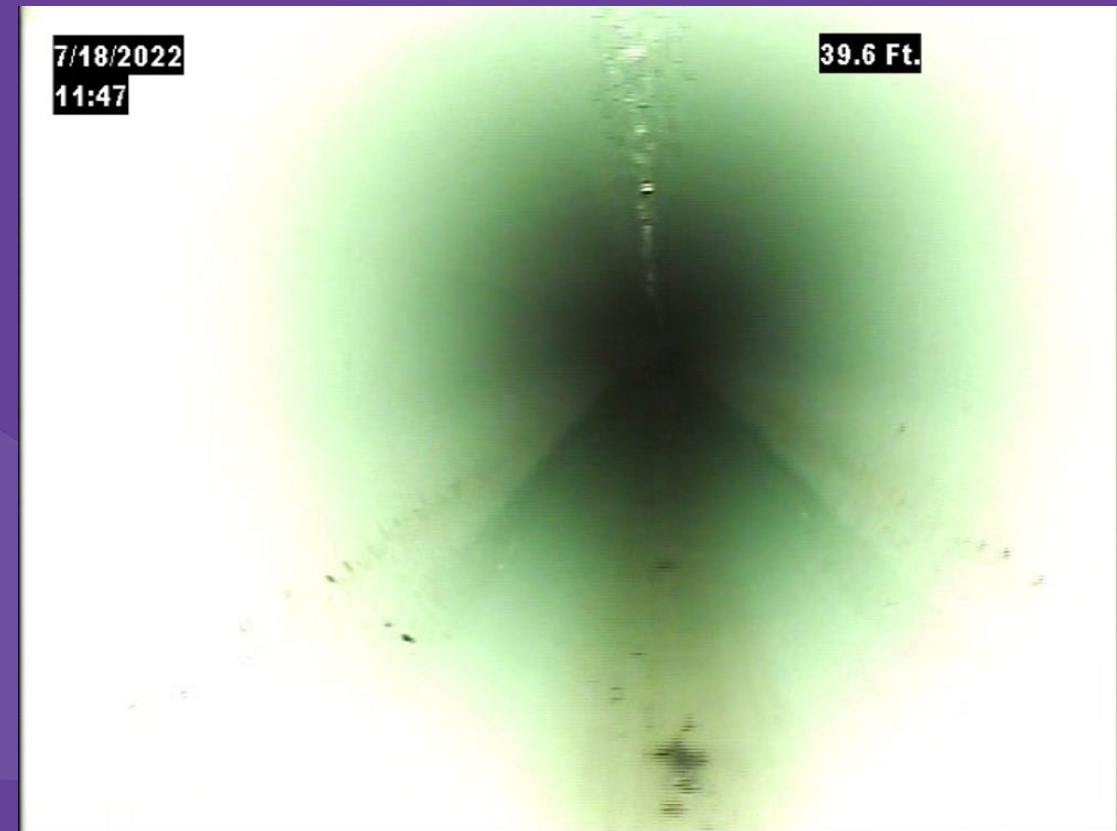
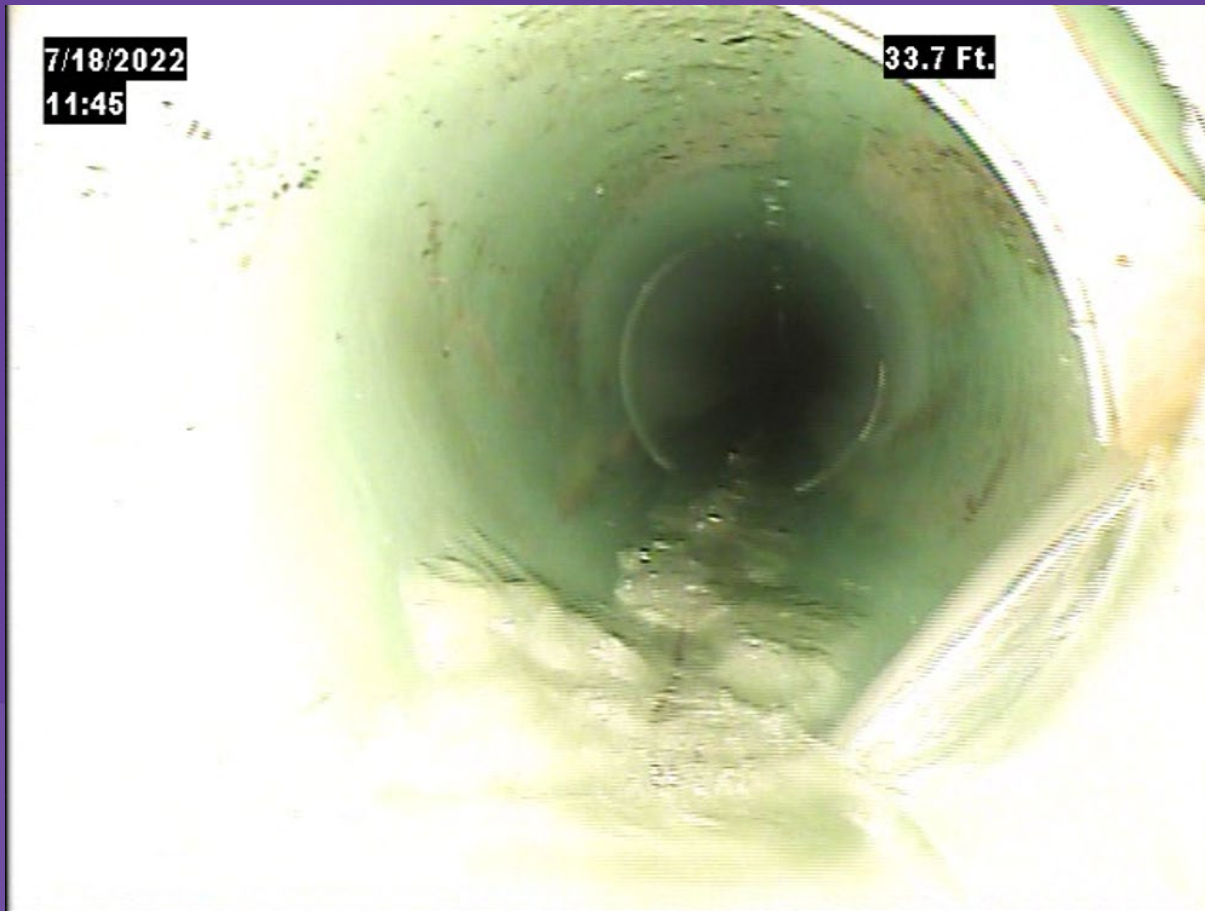






# Where's the FOG?

If I could have found a fat burg this would have been very easy to enforce.  
We looked almost two miles downstream.



# So, what happened?

Company roasting and smoking meats for retail and restaurant sale set up operations slipping by our survey program.

Development plans incorrectly accounted for total DFU's within the facility.

During cleaning operations from midnight until 6:00AM, approximately 8,000 to 10,000 gallons of water are flushed down the open drains. Lots of large pieces of meat and general debris making it to the 5,000-gallon interceptor.

Rush of water prevented any retention time within the interceptor and was enough to scour the wastewater lines downstream.

Discharge that remained in the interceptor began forming large amounts of H<sub>2</sub>S gas. The next cleaning operation sucks the gas into the POTW and create the issues for other customers downstream.

# Resolution

**Went through the end of 2022 and early 2023 with only a few complaints from downstream customers. The company had expressed plans for an increase in production and would be redesigning the FOG control at that time. Utilities desired to allow time for this to occur however in mid 2023 IPT was informed the plans for expansion were on hold due to financial issues. At that time IPT issued requirements for 30-, 60- and 90-day benchmarks to include limiting the flow to the design specifications of the current interceptor, submission of corrected plans to the building regulatory authorities and design and installation of a proper FOG control system to accommodate the capacity of the facility.**

**Questions...**

**Thank you for being part of CIPCA!**