History and Maintenance of Grease Interceptors

Rev. 10/2/2024

Definitions

EPA, United States Environmental Protection Agency: Agency tasked with environmental protection matters.

FOG: Fats, Oils and Grease; Organic polar compounds derived from animal and/or plant sources that contain multiple carbon chain triglyceride molecules. FOG normally refers to the byproduct of preparing and cooking food.

Grease Interceptor (or Trap): A generic term used in the industry to refer to any of the common types of traps, interceptors or devices used to pretreat Fats, Oils, and Grease (FOG).

Industrial User (IU): is a nondomestic source of indirect discharge into a POTW. An IU must comply with all applicable federal, state, and local pretreatment standards and requirements. A restaurant is an example of an IU.

TCEQ, Texas Commission on Environmental Quality: Texas's state environmental regulatory agency (like EPA)

POTW, Publicly Owned Treatment Works: A term used for a sewage treatment plant that is owned, and usually operated, by a government agency. This term extends to the collection system as well, such as the sewer lines and manholes.

Pretreatment: The process of treating wastewater by commercial and industrial facilities to remove harmful pollutants before being discharged to a sewer system under the control of a POTW.

SSO: Sanitary Sewer Overflow; result of a backup in a sewer system designed to take separated sanitary wastewater to a wastewater treatment plant for treatment.

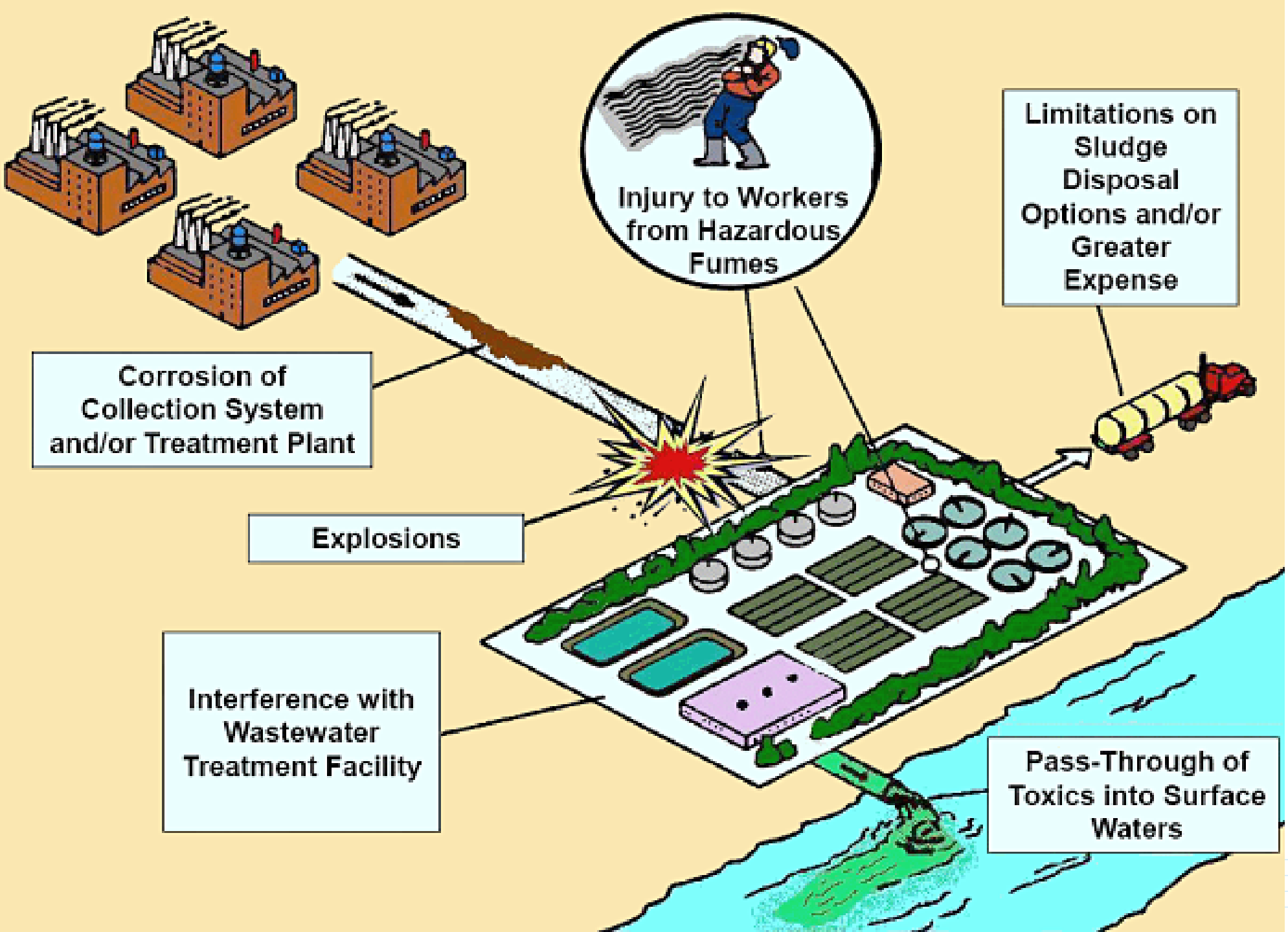
1952, Ohio Cuyahoga River Fire

By the 1960s scenes of dying fish and burning rivers were repeated regularly on the evening news.

Cause: Oily wastes and debris were ignited

Regulatory History

- Industrial Revolution of the mid 19th century introduced new sources of air and water pollution
- In **1960**s it was estimated that two thirds of U.S. rivers, lakes, and coastal waters had become so toxic they were unsafe for fishing and swimming
- In response to these environmental problems, EPA and Clean Air act was created by executive order in **1970** by President Nixon
- Clean Water Act of **1972**. For the first time provided the federal government with the legal framework to regulate pollution and the funding to help states build wastewater infrastructure
  - Immediately established the National Pollutant Discharge Elimination System (NPDES) Permit Program that regulated industrial point source pollution discharges.
  - Established the National Pretreatment Program (a component of the NPDES) which requires commercial and industrial customers to obtain permits before discharging to the POTW. These permits specify the effluent quality of wastewater before discharge.
- EPA originally published the general pretreatment regulations in **1978** and they have been revised several times since.
- **1983** – The National Pretreatment Regulations are promulgated (law takes effect)



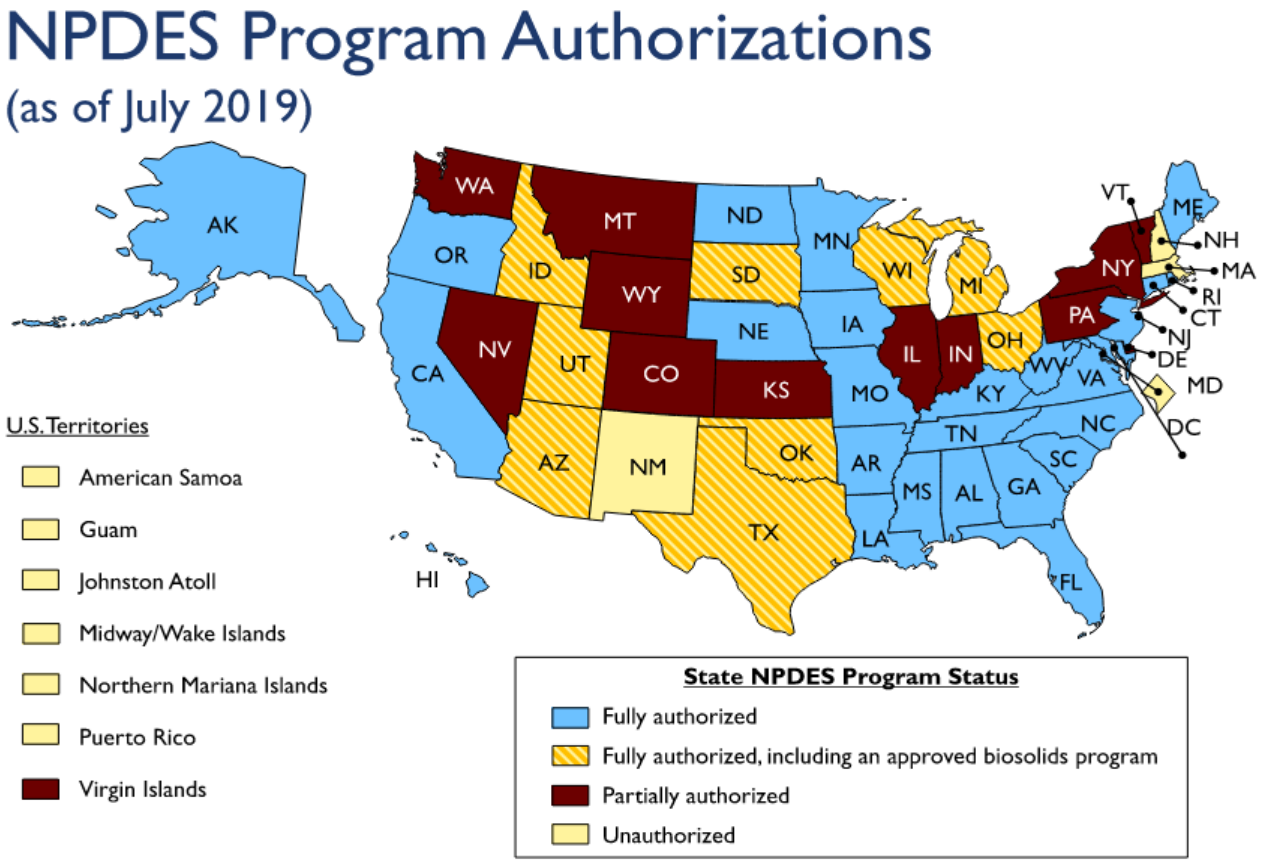
The "POTW"

Publicly Owned Treatment Works

Seventh Street in Louisville – Underground sewer explosion as a result of hexane in the sewer
Feb. 13, 1981

Pretreatment Program/NPDES

- The General Pretreatment Regulations of the National Pretreatment Program require all large POTWs (those designed to treat flows of more than **5 million gallons per day**) and smaller POTWs (**that accept wastewater from IUs that could affect the treatment plant or its discharges**) to establish local pretreatment programs.
- In a nutshell the National Pretreatment Program is a partnership between EPA, states, and POTWs to develop, implement, and enforce various aspects of the National Pretreatment Program.
- Approx 1600 POTWs nationwide
- Approx 23,000 Significant Industrial Users



Pretreatment Duties

- Identifying and locating all possible IUs
- Identifying the character and volume of pollutants contributed to the POTW by IUs
- Notify IUs of applicable pretreatment standards
- Receive and analyze reports submitted by IUs
- Conduct random sampling, surveillance, and inspection events
- Investigate and enforce on instances of noncompliance

Industrial Waste Users (examples)

Industrial Manufacturing	Chemical Manufacturing	Schools	Mixed-Use Retail
Metal Working (plating)	Oil and Gas	Pharmaceutical Manufacturing	Hospitals
Dental Offices	Car Washes	Hotels	Food Industry

General Industrial User Team

- **Who we are and what we do**
  - Review site plans to ensure the Grease Interceptor and Sample Ports are located appropriately
  - Review building plans to ensure the Grease Interceptor is sized appropriately for the type of business proposed
  - Inspect Grease Interceptors to verify they are being properly maintained and will be expected to last.

How a Grease Interceptor works

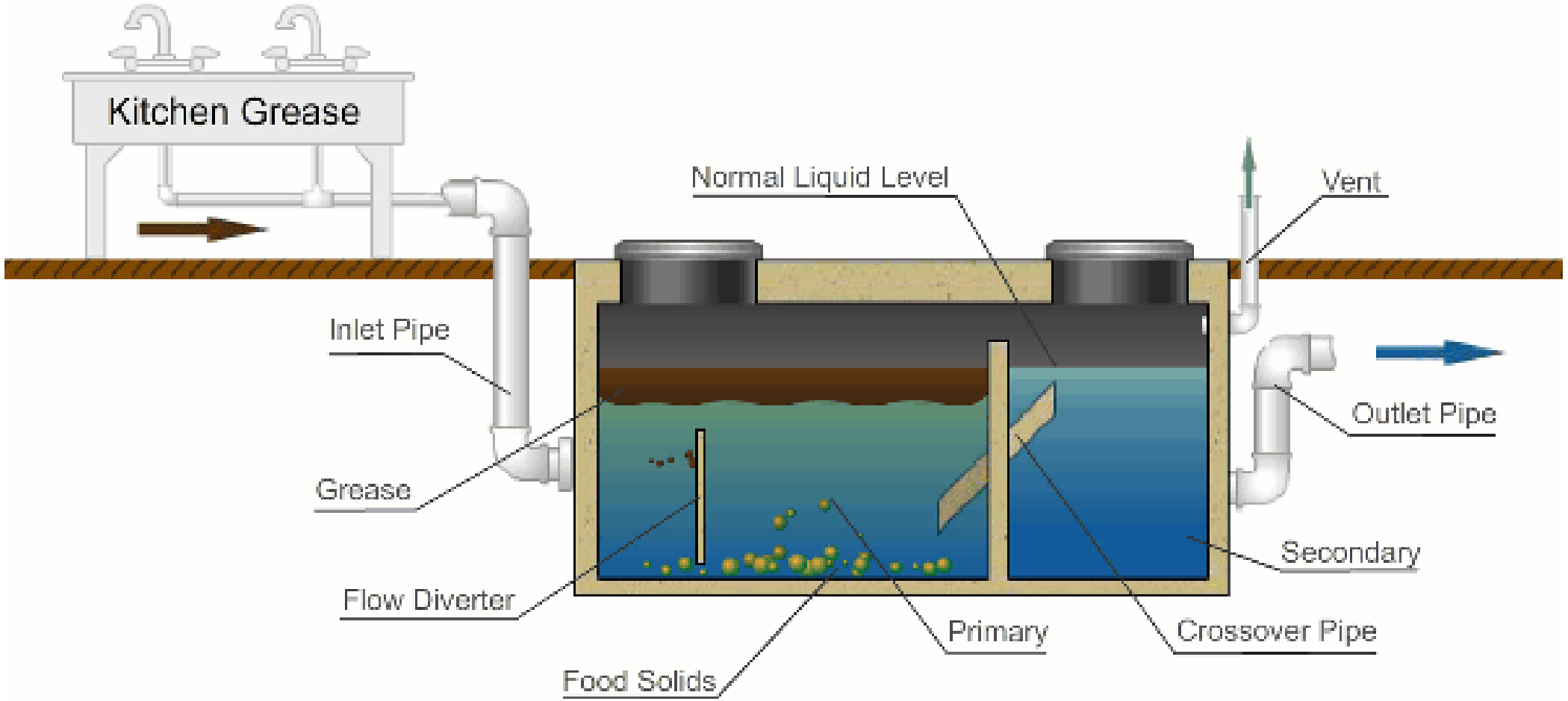
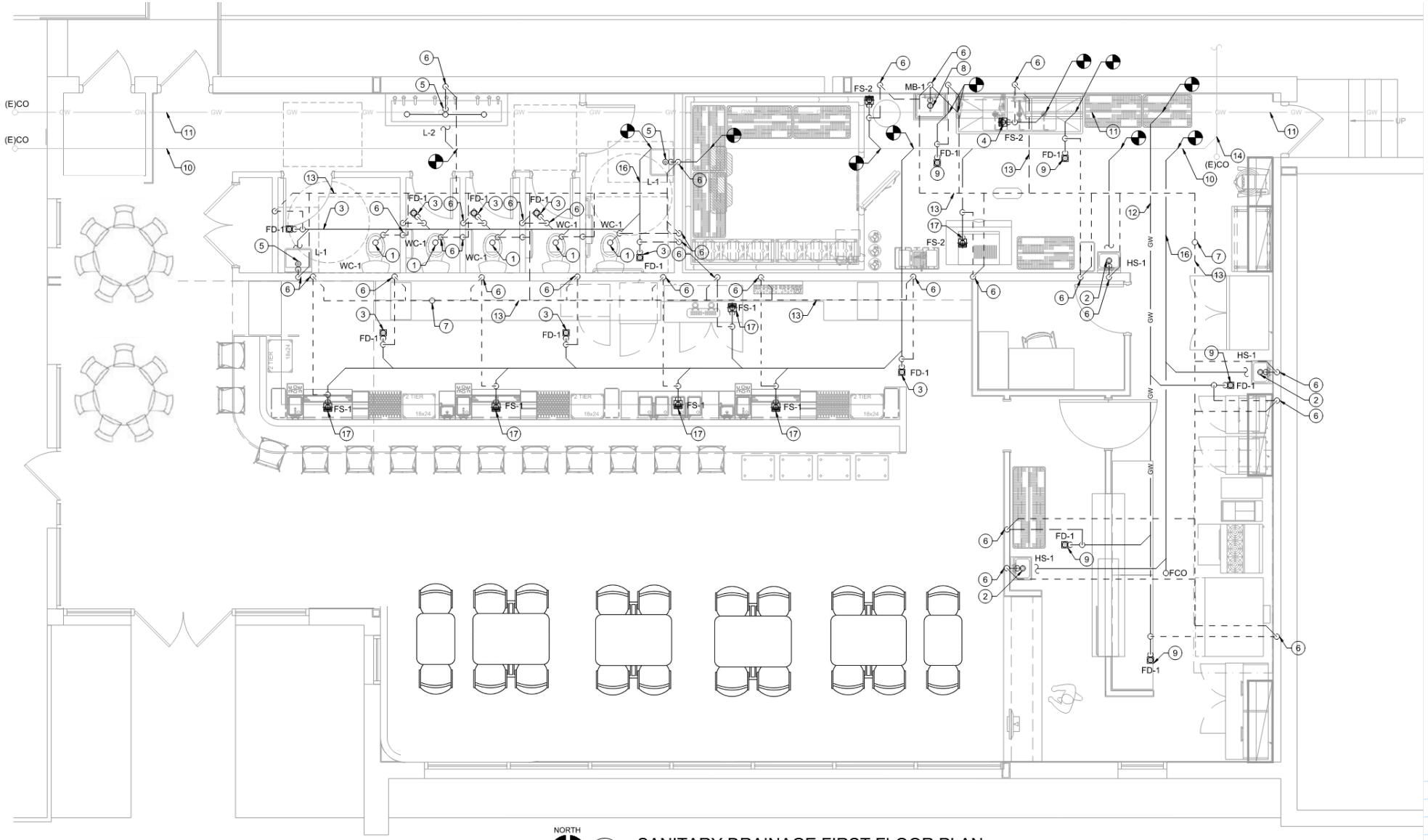


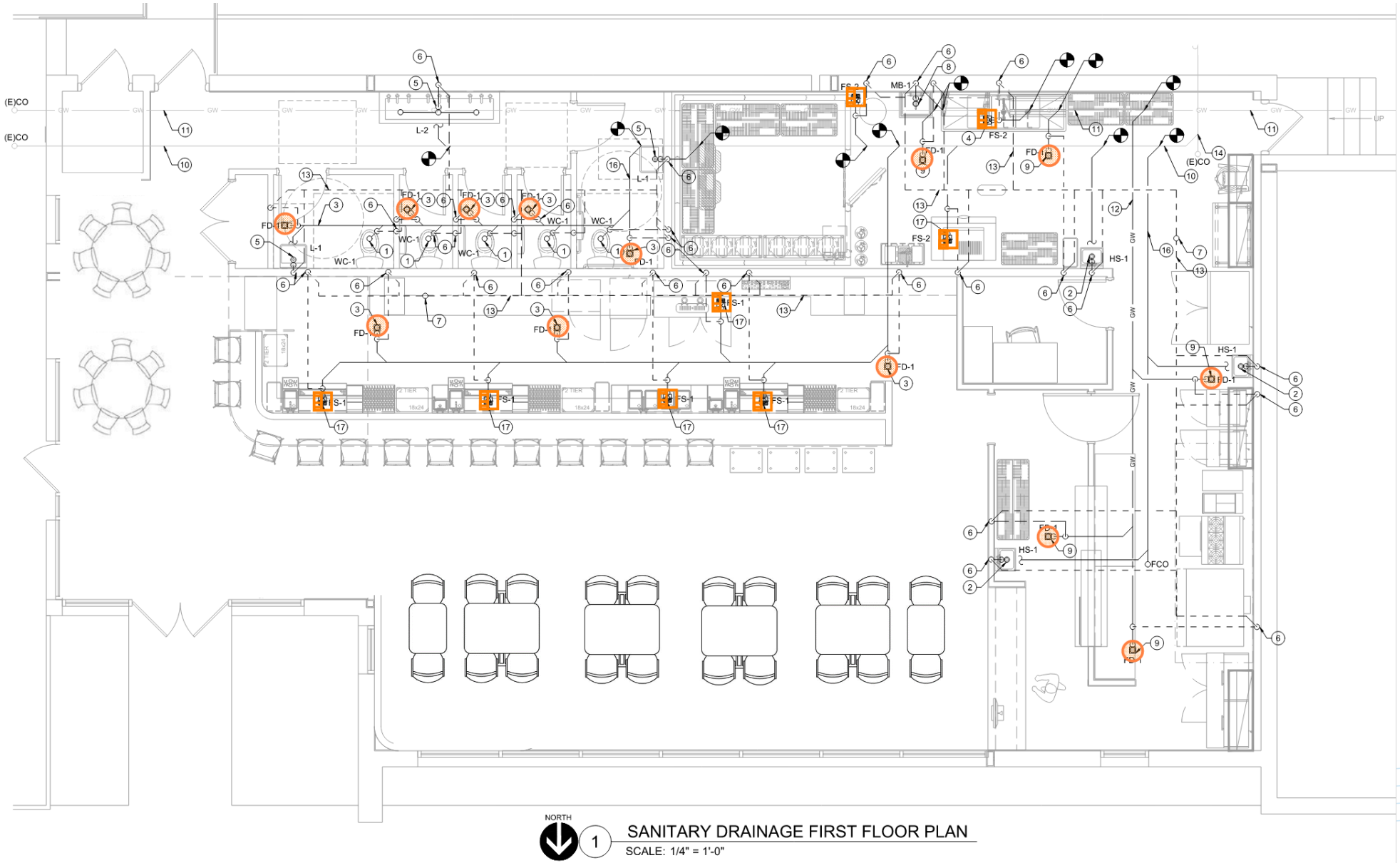
image from evergreengrease.com

The Plumbing Configuration



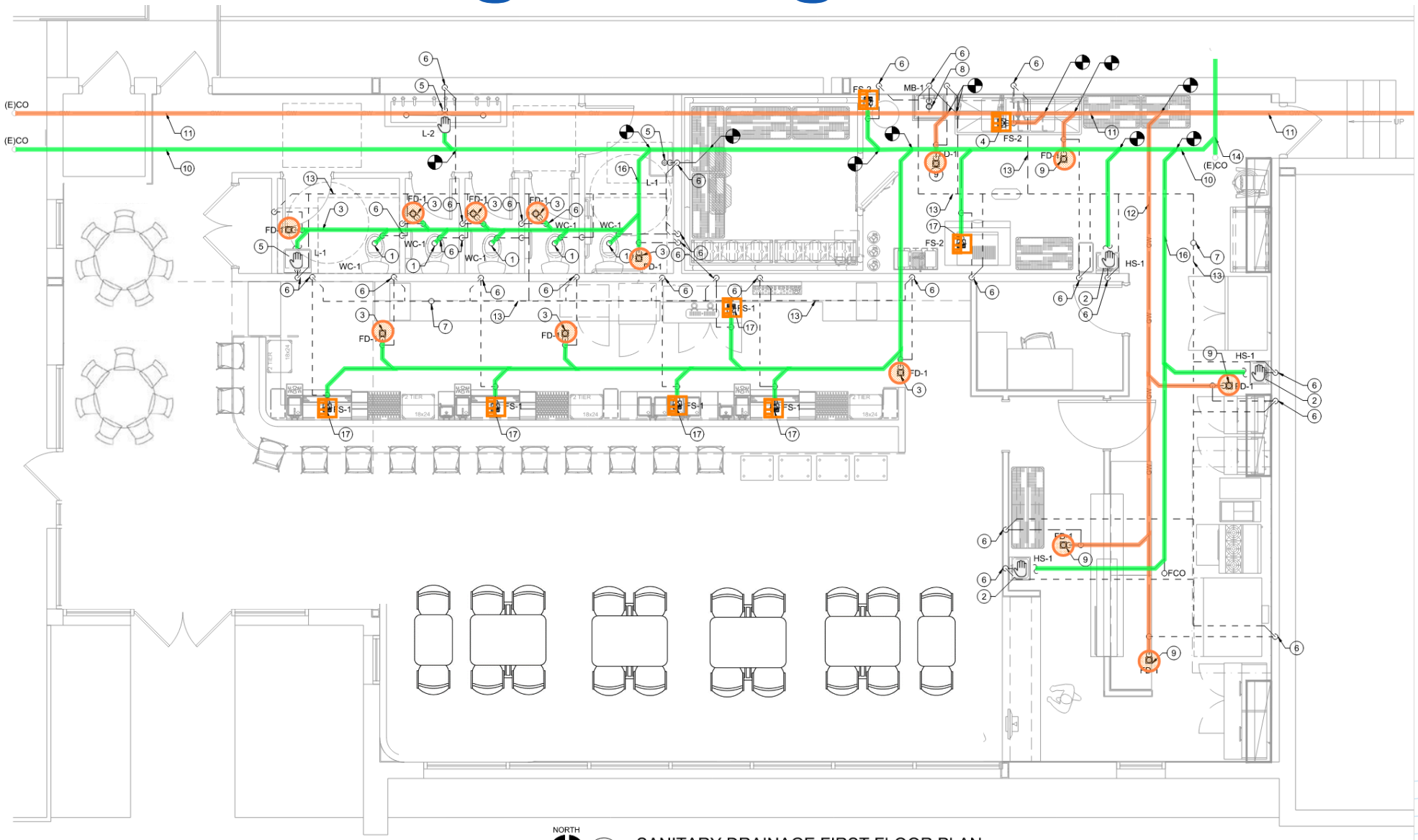
Main Street Grill
123 Main Street

The Plumbing Configuration



Main Street Grill
123 Main Street

The Plumbing Configuration



Main Street Grill
123 Main Street

Sizing the GI

Number of Fixture(s)	Size of Fixture(s)	Type of Fixture(s)	Fixture Units
5	3"	Floor drain	15
1	4"	Floor sink with a 3-compartment sink	4
			19

Fixture Units = 19

GI Flow = 3 gallons/minute

GI Holding Time = 12 minutes

19 x 3 $\frac{\text{gal}}{\text{min}}$ x 12 min = 684 gallons

750 GALLON GREASE INTERCEPTOR

Permit

INDUSTRIAL WASTE PLAN REVIEW
SITE SPECIFICATIONS

Approval:	2024-123123-00	**Date:**	01/02/2024
Service Name:	Main Street Grill		
Service:	123 Main Street		
City:	Austin	**Zip:**	78701
Process Type:	Food/Grocery	**SIC:**	5812
NAICS:			
Applicant:	ABC Consulting	**Phone:**	(512) 123-1234

Pretreatment Design Approval: The Industrial Waste Office of the Special Services Division has reviewed the plans submitted by the establishment named above and has approved the use of a pretreatment device which meets the specifications described below.

Qty	Waste Source/Fixture		Fixture Unit Count
5	3" FD		15
1	4" FS w/3-Comp Sink		4
		Total:	19
		GPM:	57
		Pretreatment Device:	684 Gallons

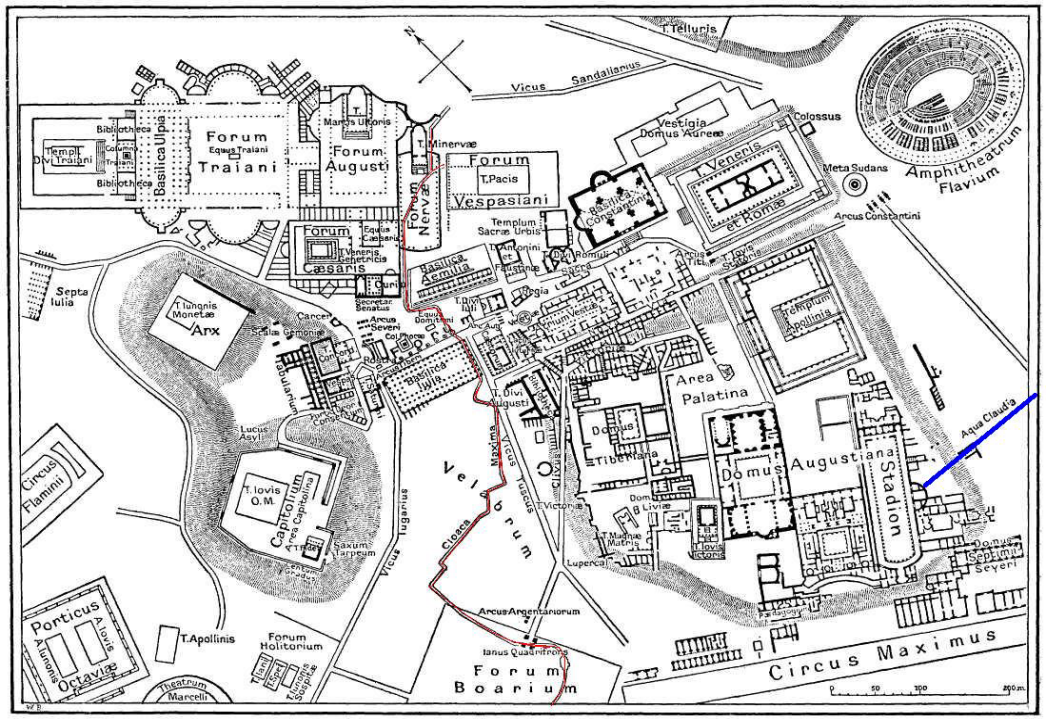
Comments: Main Street Grill may use 684 gallons of an existing 1,000-gallon grease interceptor.

Sample Port Review

An existing wastewater service stub access (*private 2-way cleanout*) is serving as the sample port.

History-Sewers

- Roman Engineered System - Cloaca Maxima



Images Source: Urban Water Systems: The Great Sewer of Ancient Rome

History-Grease Traps

- 1884 Grease Trap

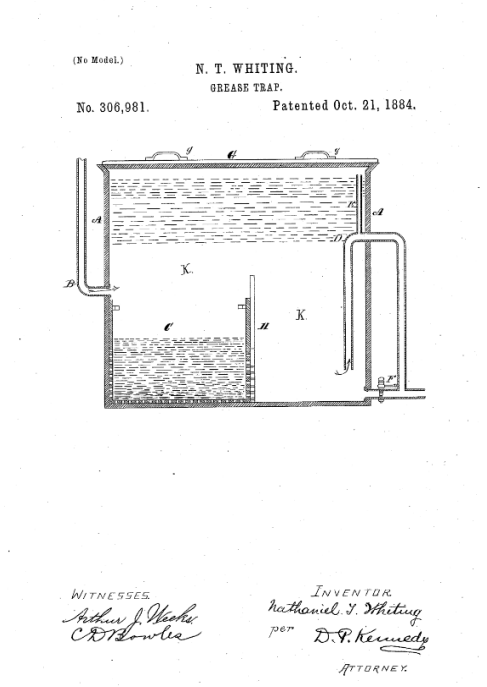


Image Source: Google Patents

- World War 2

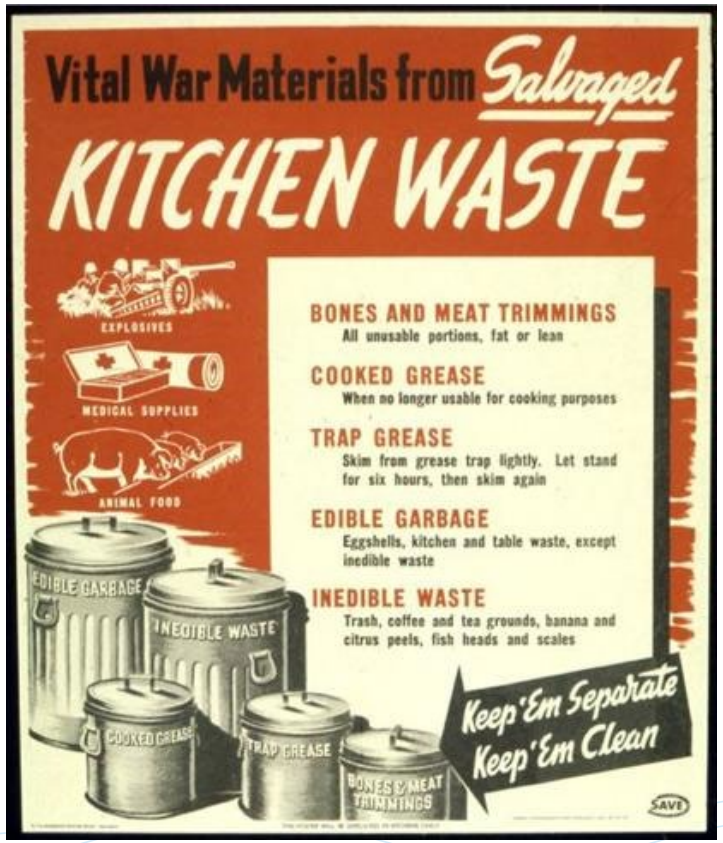


Image Source: Despite please from the likes of Uncle Sam and Minnie Mouse, it was likely hard to part with bacon drippings

- EPA "appurtenances"

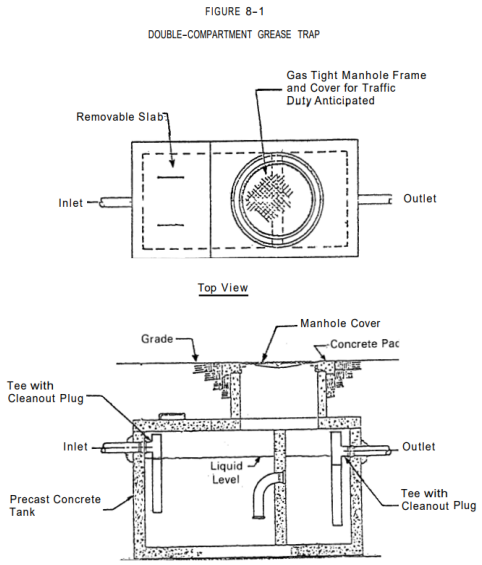


Image Source: EPA Design Manual-Onsite Wastewater Treatment and Disposal Systems

No Pretreatment

- Food Service Establishments--> each produce thousands of gallons of FOG/year
- FOG can cause damage to the:
  - Sewer System;
  - Wastewater Treatment Plant (WWTP);
  - Watershed and Environment;
  - Public Health.
- Increases operating costs $$$ for utilities and customers.

Image source: Fatbergs: What do these blubberyclots say aboutour society and how can we deal with them?

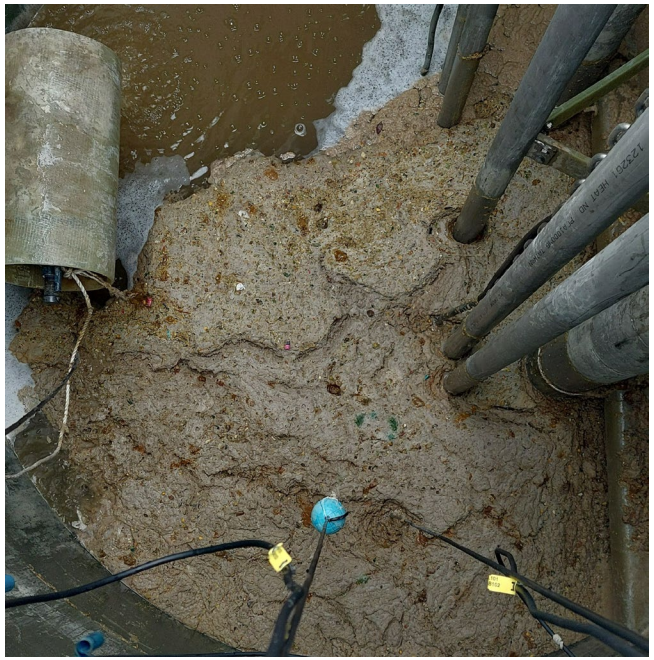


Image Source: Parklink

Image Source: Fatberg crews face a whale of a task in London's sewers

Water Tip: Don't Pour Oil and Grease Down Your Drain

Disposing of fats, oils and grease (FOG) in the sewer system can clog pipes and cause untreated wastewater to back up into homes and businesses.

BY CAROL FLAKE MARCH 11, 2014 12 AM CENTRAL SHARE REPUBLISH

Wastewater not treated enough to be put on golf courses gets dumped into the Trinity River. Village Creek Water Reclamation Facility. Djakhangir Zakhidov

Disposing of fats, oils and grease (FOG) into the sewer system can clog pipes and cause untreated wastewater to back up into homes and businesses. The San Jacinto River Authority has posted a warning about pouring materials down kitchen drains that contain oil and grease, pointing out that FOG can also damage septic systems and contaminate local waters.

Image Source: water Tip: Don't Pour Oil and Grease Down Your Drain

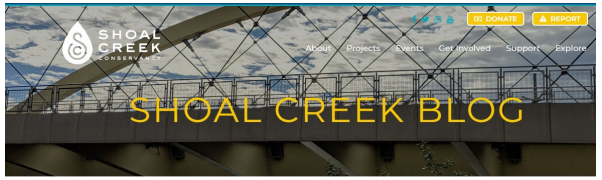


Image Source: Opinion: 'Fatbergs" of Holiday Grease Dangerously Clog California Sewage Systems

FOOD GREASE SPILL IN SHOAL CREEK INVESTIGATED

December 19, 2016 | By Shoal Creek Conservancy

After the receiving the following report of pollution in Shoal Creek, the Conservancy would like to remind our fellow Austinites to help protect Austin's water quality by reporting any pollution discharges spotted in any creeks and lakes in the Austin area. Pollution reports should be made to the City's **24-hour Pollution Hotline at 512-974-2550** as soon as possible. The Pollution Prevention and Reduction (PPR) staff from the Watershed Protection Department are on call 24/7 to investigate the pollution site and prevent further threats to water quality and surrounding wildlife.

On the morning of December 12, a citizen called the City of Austin Watershed

Image Source: Food Grease Spill in Shoal Creek Investigated

Grease blockage causes another Alpine Utilities sewage overflow

Published: Mar. 1, 2011 at 8:16 PM CST | Updated: Mar. 11, 2011 at 8:16 PM CST

The spill next to Stoops Creek (Source: John Scarborough)

Image Source: Grease Blockage causes another Alpine Utilities sewage overflow

Poor Grease Trap Maintenance

- How it affects a Food Service Establishment:
  - Clogs inlet/outlet lines;
  - Clog the grease trap;
  - Odor;
  - Degrade the grease trap interior;
  - Raw sewage and wastewater backups;
  - Plumber or City permit fees to fix;
  - Rodent/vector infestations;
  - City violations/enforcement, resulting in $ loss;
  - Possible shut-downs until corrected.

THE ITHACAN

Accuracy • Independence • Integrity

Wednesday, May 8, 2024

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News

Cornell's Starbucks workers strike after grease trap failure

By Elijah de Castro, News Editor
April 20, 2022

That morning — while the coffee shop was already overworked and understaffed — the grease trap in the kitchen overflowed, spreading a cocktail of congealed kitchen grease, oil and runoff across the floor. Despite customer complaints of the odor and workers trying to close the store for safety, the store was kept open. This decision was made by the store's then-acting manager, Victor Rodostny, who did not respond to a request for comment.

"I told him that it wasn't safe to stay open and [that] I'm closing the store," Benjamin South, the store's shift supervisor said. "He immediately came to the store and demanded we open it back up. [The workers] talked about it … I said 'Hey if we were to walk–out on strike would y'all want to do it?' and we all agreed that we would."

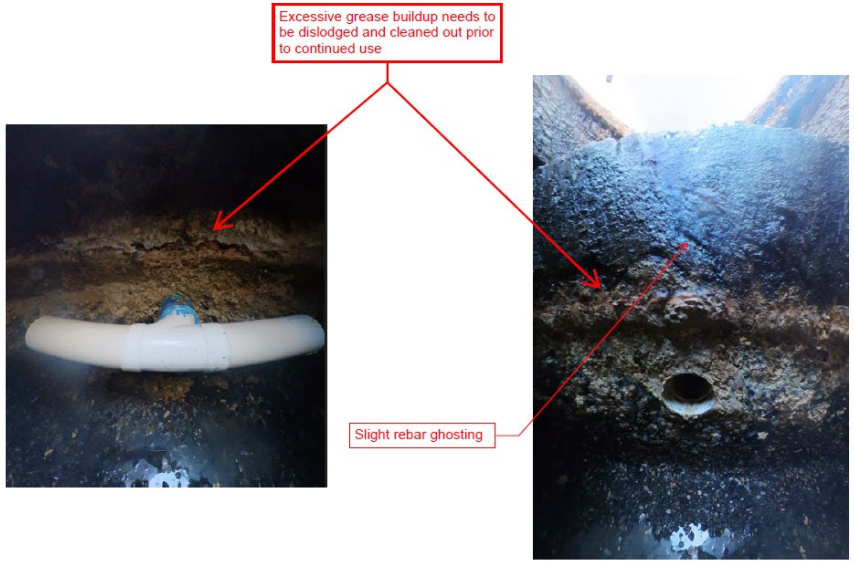
Image Source: Cornell's Starbucks workersstrike aftergrease trap failure – THE ITHACAN

NEWS

Why did Visalia's The Lunch Box close? It's a stinky story, literally

The popular downtown Visalia eatery has closed over dispute over "foul odors"

Image Source: Why did Visalia's The Lunch Box close? (visaliatimesdelta.com)



Best Management Practices

- Regular inspections for defects;
- Ensure proper use;
- Ensure appropriate kitchen practices;
- Liquid Waste Hauler pump-out

Exterior Inspection
3. Are the GT lids damaged? ☐ Yes ☐ No If damaged, indicate: ☐ Missing lid ☐ Lid welded shut ☐ Hole or crumbling concrete ☐ Other
Interior Inspection (Empty GT)
4. Are the inlets and outlets clogged, loose or damaged? ☐ Yes ☐ No If damaged, indicate: ☐ Large grease chunks ☐ Backup in kitchen floor drains ☐ Grease overflow over top of baffle wall ☐ Foreign object in GT
5. Is the internal piping intact? ☐ Yes ☐ No If damaged, indicate: ☐ Broken/Dislodged flow diverter ☐ Inlet: Broken/Twisted piping ☐ Outlet: Broken/Twisted piping ☐ Broken baffle wall T piping ☐ Other
6. Does the GT have structural damage? ☐ Yes ☐ No If damaged, indicate: ☐ Structural rebar showing (large, thick rebar can be seen) ☐ Rebar ghosting (thin rebar panels in wall can be seen though concrete) ☐ Holes through exterior wall(s) or floor
7. Is the mid-wall baffle secure and operational? ☐ Yes ☐ No If damaged, indicate: ☐ Hole ☐ Structural issue

§ 15-10-197 - REQUIREMENTS FOR CLEANING GREASE TRAPS.

(A) A person who discharges wastewater from a grease trap to the POTW shall:

(1) completely remove all fat, oil, or grease waste, other liquid waste, semi-solid or solid and residue from the grease trap when the grease trap is cleaned;

(2) clean the grease trap the earlier of:

(a) at least every ninety days; or

(b) when 50 percent or more of the wetted height of the grease trap, as measured from the bottom of the grease trap to the invert of the outlet pipe, contains grease and solids;

Health Dept. – What to look out for

- Lack of grease trap
- Bad grease traps
- Bad management practices
- Stuff all of us can look for in the field
- Contact your pretreatment department if concerns

Resources

- Roman Aqueducts (nationalgeographic.org)
- Water Structures and the Human Health – Engineering Rome
- Cloaca Maxima: Ancient Rome's Engineering | Omrania
- Cloaca Maxima - The Great Sewer of Ancient Rome | UNRV
- What toilets and sewers tell us about ancient Roman sanitation (phys.org)
- US306981A - Grease-trap - Google Patents
- Ken Louck - IW's Grease Interceptor Training Guide, 2019 Edition
- Design Manual: Onsite Wastewater Treatment and Disposal Systems, EPA 625/1-80-012
- Grease war | History | thesylvaherald.com
- What is FOG (fats, oils and grease)? | Wastewater Digest (wwdmag.com)
- Document Display | NEPIS | US EPA-Treatability of Oil and Grease Discharged to Publicly Owned Treatment Works
- Fatbergs: What do these blubbery clots say about our society and how can we deal with them? | The Independent | The Independent
- Scientists Solve a Puzzle: What’s Really in a Fatberg - The New York Times (nytimes.com)
- Fatberg crews face a whale of a task in London's sewers (smartwatermagazine.com)
- DCEQ.nc.gov/environmental assistant and customer service/fog/BMP2