

## Fats, Oils, & Grease (FOG) Regulations and New Technologies

The Candid Truth About the Regulations  
and What New Technologies May Work to Meet  
those Regulations



John Shaffer, President  
Phone (714) 667-2300

Environmental Engineering & Contracting, Inc.  
e-mail: jshaffer@eecworld.com

---

---

---

---

---

---

---

---

### What is

- **Fats** from cooking meats
- Lard, shortening, cooking **oils**
- Fryer **grease**



---

---

---

---

---

---

---

---

### What is the Problem?

FOG is causing blockages and sanitary sewer overflows (SSOs) in:

- ◆ Drain lines
- ◆ Private sewer laterals
- ◆ Main sewer lines and lift stations



---

---

---

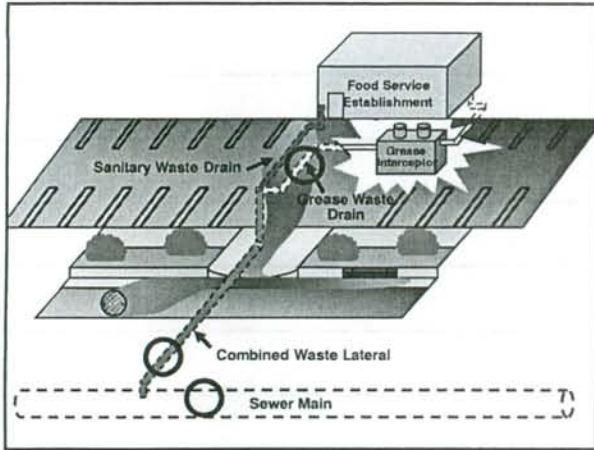
---

---

---

---

---



---

---

---

---

---

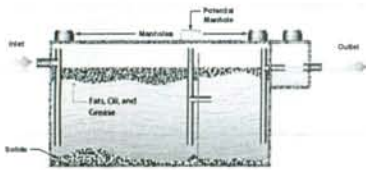
---

---

---

### Grease Interceptors Are Not The Total Solution

- Interceptors can effectively remove grease before it causes sewer blockages, however...
  - Some FSEs have no interceptor installed
  - Many installed are not cleaned or maintained adequately



---

---

---

---

---

---

---

---

### Too Much FOG is Being Discharged into Kitchen Drains

- Fryer drippings, spills
- Grills, woks
- Dishwashing
- Garbage disposals



---

---

---

---

---

---

---

---

### What is Coming? State and Local Regulations

- Permits have been issued by states such as California and Connecticut to require sewerage agencies to adopt FOG Control Programs.
- FOG Control Programs must be in place by ???
- ◆ Requirements for:
  - ◆ Grease interceptor installation and proper maintenance
  - ◆ FSE inspections and enforcement
  - ◆ Permits and fees




---

---

---

---

---

---

---

---

### National Restaurant Association FOG Control Tool Kit: Why?

- To provide State Associations and individual restaurants with a general understanding of:
  - The problem
  - The regulations
  - FOG control practices
  - Guidance for evaluating FOG control requirements
- Facilitate informed discussions with sewerage agencies to develop effective and fair FOG Control Programs
- Put everyone on the same page

---

---

---

---

---

---

---

---

### Elements of FOG Control Programs Already in place or coming soon

- Permits
- Implementation of Kitchen Best Management Practices (BMPs)
- Grease control devices (grease interceptors and traps)
  - Installation requirements
  - Cleaning and maintenance requirements
- Oil and grease discharge concentration limits

---

---

---

---

---

---

---

---

### Permits

- Some sewerage agencies require permits, others do not
- Most permits are overly complicated
- NRA recommendations:
  - Simple and easy to understand permits
  - Clearly spell out the requirements



---

---

---

---

---

---

---

---

### Recommended Kitchen BMPs

- Segregation, collection, and recycling of cooking oil
- Scrape food waste into the trash recycle
- Installation and use of drain screens
- Wipe up grease spills
- Limit garbage disposal use
- Employee training



---

---

---

---

---

---

---

---

### Benefits of Improved Kitchen BMPs

- Reduced drain line blockages and jetting
- More yellow grease recycling and interceptor pumping
- Reduced SSOs
- Reduced odors



---

---

---

---

---

---

---

---

### Grease Control Device Installation Requirements

- New restaurants
  - Most are required to install an outdoor grease interceptor
- Existing restaurants
  - Many are now being required to retrofit their restaurants and install outdoor grease interceptors
- NRA recommendation
  - Non-grease generating restaurants should not be required to install outdoor grease interceptor
- Plumbing and sizing requirements
  - Varies throughout the country based on plumbing codes and agency preferences

---

---

---

---

---

---

---

### Grease Control Device Cleaning and Maintenance Requirements

Already in place or coming soon

- Gravity Grease Interceptors
  - Minimum quarterly cleaning before 25% full of grease and
  - Full pump-outs every time
- Hydromechanical Grease Interceptors
  - Minimum weekly cleaning



---

---

---

---

---

---

---

### Benefits of Increased Cleaning and Maintenance of Grease Control Devices

- Reduced drain line blockages and jetting
- Reduced SSOs
- Reduced odors



---

---

---

---

---

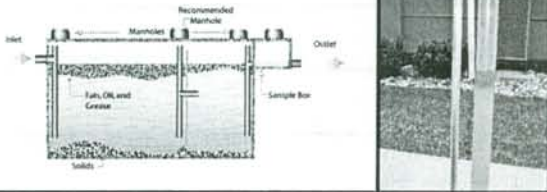
---

---

## Grease Interceptor Maintenance & Enforcement

### The "25% Rule"

The combined depth of the FOG layer and solids layer cannot exceed 25% of the total liquid depth of the interceptor



---

---

---

---

---

---

---

---

## Garbage Disposals (Food Waste Disposers) at Restaurants: EEC Local Condition Pros/Cons?

- Pros:
  - They result in less landfill solids
  - They result in less food waste handling
- Cons:
  - They can encourage kitchen staff to put more greasy waste down the drain
  - They result in more solids in the drain lines, grease control devices, or the sewer system
- Many sewer agencies have restricted garbage disposal use at restaurants due to the cons

---

---

---

---

---

---

---

---

## Should all Restaurants be Regulated? EEC Opinions

- National FOG Control Study Conclusions
  - Most sandwich shops, juice shops and specialty coffee shops should be exempt from the FOG Control Program, unless there is conclusive evidence (e.g., closed circuit television) that they are causing or contributing to blockages
  - Many discharge dairy products and small amounts of food waste that could be measured as FOG or would separate in a grease control device, but they don't accumulate in the sewer



---

---

---

---

---

---

---

---

## New FOG Control Technologies




---

---

---

---

---

---

---

---

## New FOG Control Technologies

- Grease Removal Devices
- New Grease Interceptor Technologies




---

---

---

---

---


---

---

---

## Orange County FOG Control Study Phase II – Study Format

- EEC Field Tested Four Relatively New FOG Control Technologies Under Closely Monitored Conditions for Approximately 6 Months
  - Non-conventional Grease Traps (G)
  - Additives
  - Interceptor Monitoring Devices
- 50+ Manufacturers/Suppliers In
- Evaluated as Alternatives to Cur
- Technologies and Approaches
- Reported the Findings and Mad
- Recommendations




---

---

---

---

---

---

---

---



---

---

---

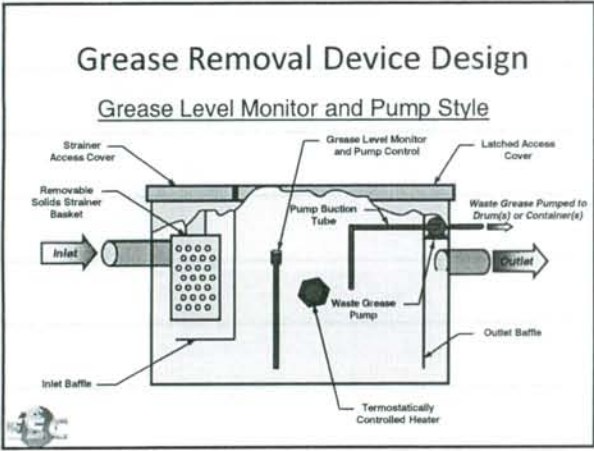
---

---

---

---

---



---

---

---

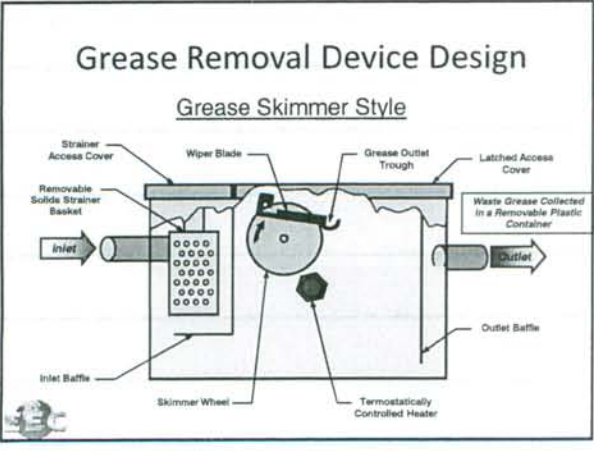
---

---

---

---

---



---

---

---

---

---

---

---

---



---

---

---

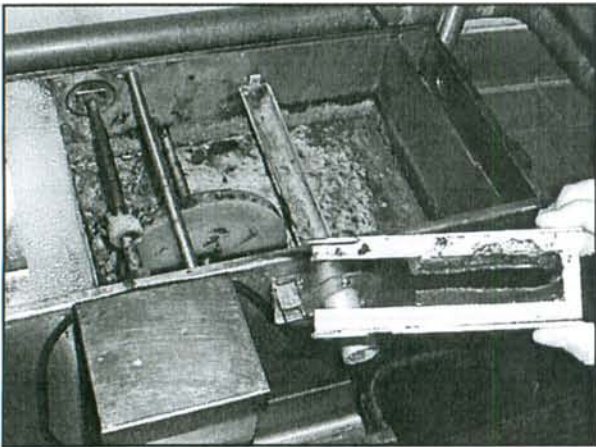
---

---

---

---

---



---

---

---

---

---

---

---

---

**Grease Removal Devices**

- Located Under the Counter or In a Vault in the Kitchen or Outside
- Features:
  - Small capacity
  - Short retention time (0.5 – 3 minutes)
  - Automatic skimming or pumping of floating FOG
  - Manual solids basket removal
  - Heating elements
- Evaluated as an Alternative to a Conventional Grease Interceptor

---

---

---

---

---

---

---

---

## Grease Removal Devices

- 21 Initial Installation Evaluations
  - 9 were connected to one grease waste drain
  - 12 were connected to all the grease waste drains
  - 10 had significant cleaning/maintenance issues
  - 8 had installation issues or significant grease waste drains were not connected
- 9 Installations Selected for 6-month Evaluation
  - 7 to 8 Well Maintained Units
    - Effective separation and capture of floating FOG
  - 1 to 2 Poorly Maintained Units
    - Not full capture of floating FOG = FOG Pass Through



---

---

---

---

---

---

---

---

## Grease Removal Devices

- Finding #1:
  - If the GRD(s) is connected to the significant grease waste drains (e.g., pre-rinse sink, pot sink) and is maintained properly, the GRD will be effective in removing a vast majority of the floating FOG
    - Examples of proper maintenance:
      - Solids basket is removed daily
      - Skimmer blades are cleaned regularly
      - Skimmer blades are replaced before wearing down
      - Waste grease containers or drums are emptied regularly
      - Timer is set correctly
      - Entire GRD is cleaned out and inspected once/quarter



---

---

---

---

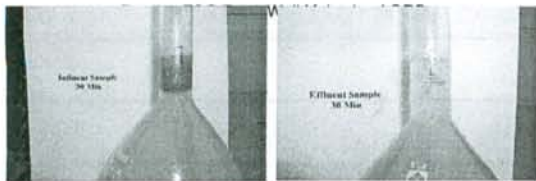
---

---

---

---

## Grease Removal Devices



Influent Sample

Effluent Sample

---

---

---

---

---

---

---

---

## Grease Removal Devices

- Finding #2:
  - If the GRD is not connected to all the significant grease waste drains or is not maintained properly, much of the floating FOG will not be collected by the GRD = FOG pass through.
    - Examples of poor maintenance:
      - Solids basket is removed only when the drain is slowed
      - Skimmer blades are never cleaned
      - Skimmer blades are worn down and removing very little FOG
      - Waste grease containers or drums are overflowing
      - Timer is set incorrectly
      - Unit is unplugged
      - GRD is never cleaned out or inspected



---

---

---

---

---

---

---

---

## Grease Removal Devices

Floating FOG Test - Poorly Maintained GRD



Influent Sample

Affluent Sample



---

---

---

---

---

---

---

---

## Grease Removal Devices

- Conclusions:
  - If properly maintained, GRDs can be effective on the fixtures they are connected to, despite the short retention times
  - Higher risk than a conventional grease interceptor due to dependence on FSE cleaning/maintenance and common failure to connect to all grease waste drains
  - Many potential installation issues, but they can be mitigated through strict and logical plumbing requirements
  - Many potential maintenance issues, but they can be mitigated if there are frequent inspections and meaningful enforcement
  - A conditional variance is a very logical approval method for GRDs, particularly for existing FSE retrofits
  - Primary condition of the variance should be proper maintenance verified by a FOG inspector

---

---

---

---

---

---

---

---

### New Grease Interceptor Technologies

- **Interceptor Monitoring Devices**
  - Automatically and continuously measures the floating FOG and settled solids in the interceptor
  - Still in the R&D trial and error phase
- **Combined Waste Interceptors**
  - Designed to treat apartment building & large hotel waste
  - Going through the plumbing code approval process
- **Pumper Truck On-site Treatment**
  - Return treated water back to the interceptor
  - Sewering agencies are very concerned about cheating

---

---

---

---

---

---

---

---

### Questions?



---

---

---

---

---

---

---

---