

FATS OIL AND GREASE BEST MANAGEMENT PRACTICES MANUAL (BMPs)

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Fats, oil and grease, called FOG in the wastewater business, have negative impacts on wastewater collection and treatment systems. A large percentage of wastewater collection system blockages can be traced to FOG. Blockages in the wastewater collection system are serious, causing sewage spills, manhole overflows or sewage backups in homes and businesses.

This manual was written to provide food service establishment (FSE) managers and owners with information about animal and vegetable based oil and grease prevention techniques that are effective in both reducing maintenance costs and preventing oil and grease discharges to the sewer system.

Many food service establishments participate in FOG recycling programs. Ensuring that “grease control devices” are properly designed, sized, installed and most importantly maintained is more difficult. This manual focuses on proper maintenance of grease control devices and includes answers to many of the commonly asked questions related to grease pretreatment.

Knowledgeable City staff, working with business owners, can effectively prevent oil and grease buildup and associated problems for both the Wastewater Treatment Plant and the food service establishment owner.

If you have questions, please call the City of Bangor Code Enforcement Division at 992-4230 or the Wastewater Treatment Division at 992-4470.

FREQUENTLY ASKED QUESTIONS:

Is grease a problem?

In the sewage collection and treatment business the emphatic answer is YES! Grease is singled out for special attention because of its poor solubility in water and its tendency to separate from the liquid solution.

Large amounts of oil and grease in the water cause trouble in the collection system pipes. It decreases pipe capacity and, therefore, requires the piping systems be cleaned more often and/or some piping to be replaced sooner than otherwise expected. Oil and grease also hamper effective treatment at the wastewater treatment plant.

Grease in warm water may not appear harmful. But as the water cools, the grease or fat congeals on the interior of pipes and other surfaces which may cause a blockage of the sanitary sewer, and even shutdown of wastewater treatment units.

Problems caused by FOG from restaurants and other food service establishments have served as the basis for ordinances and regulations governing the discharge of grease materials to the sanitary sewer system. The discharge of FOG has forced the requirement of the installation of “**Grease Control Devices**”, commonly known as grease traps, interceptors or FOG Disposal Systems.

Do I need a grease control device?

Any food service establishment that prepares foods is required to install a grease control device.

Do I have a grease control device?

If you are uncertain whether your establishment has a grease control device, you should contact the City of Bangor Code Enforcement Division at 992-4230.

What is a “grease trap” and how does it work?

A grease trap is more correctly known as a hydro-mechanical interceptor, and is intended to be used as a pretreatment device to reduce loading to the “gravity grease interceptor”. A grease trap is a small reservoir built into the wastewater piping leading from the grease producing area. Baffles in the reservoir retain the wastewater long enough for the grease to congeal and rise to the surface. The grease can then be removed and disposed of properly. See [How A Grease Trap Works](#) for a description of how various components of a hydro-mechanical interceptor function.

What is a “gravity grease interceptor” and how does it work?

A gravity grease interceptor is a vault with a minimum capacity of 600 gallons. Sometimes these may be located in a building basement, but are more often located exterior to a building, in the ground. The vault includes a minimum of two compartments, and flow between each compartment is designed for grease retention. The capacity of the interceptor provides adequate residence time so that the wastewater has time to cool, allowing any remaining grease not collected by the hydro-mechanical trap to congeal and rise to the surface where it accumulates until the interceptor is cleaned.

What is a “FOG disposal system”?

FOG disposal systems are engineered alternatives to traps and interceptors. They are designed to remove grease from wastewater to acceptable levels.

How do I clean my grease control device?

Please refer to *Grease Control Device Maintenance*.

Can you recommend a maintenance schedule?

Best Management Practices and the National Restaurant Association recommend cleaning a (hydro-mechanical interceptor) grease trap weekly. Some establishments will find it necessary to clean their traps more often. Gravity grease interceptors should be cleaned twice annually at a minimum. **By industry standards and Best Management Practices, both types of grease interceptors, hydro-mechanical and gravity, should be cleaned when the grease layer and solids on the bottom combined exceed 25% of the unit capacity.** FOG disposal systems should be maintained according to the manufacturer’s recommendations.

What if I don’t install a grease control device?

Most foods contain oil or grease, even coffee. Additionally, if the establishment uses fats, oil or grease in food preparation, it will eventually encounter a maintenance problem with a plugged building sewer line, or will cause or contribute to the municipal sewer plugging. The blockage can create a sewer backup situation and ultimately a potential health problem in the establishment. If the problem is in the building sewer line, then the establishment has direct responsibility for paying for the maintenance. If the blockage or restriction is on the public sewer main, and it can be proven that the establishment is the cause of the blockage, then the establishment may have to pay for the public sewer to be maintained. Blocking a sanitary sewer line resulting in a sanitary sewer overflow is also a violation of the federal Clean Water Act, state and local law.

Who determines whether I need a grease control device?

When waste pretreatment is required by the City, an approved grease control device shall be installed according to the Maine Uniform Plumbing Code (MUPC). The MUPC and the City of Bangor Ordinances will assist the establishment in making this determination. The City of Bangor Sewer Use Ordinance (SUO) prohibits the discharge of materials that can solidify and create blockages in the sewer system or treatment plant. The city makes periodic inspections to assure proper installation of and maintenance of grease control devices.

How can I get into compliance?

Representatives of the food service establishment should contact the City of Bangor Code Enforcement Division at 992-4230 or the Wastewater Treatment Division at 992-4470. If a grease control device is necessary or modification of the existing system is required, the establishment shall purchase a plumbing permit for the device through Code Enforcement located at City Hall.

What are the criteria for inspecting grease control devices?

The establishment is responsible for periodically inspecting and maintaining their grease control system at a frequency that will assure adequate protection of the City of Bangor Sewer System. All food service establishments may be inspected by the City of Bangor. Bangor uses the following criteria to assess the condition of both hydro-mechanical and gravity grease interceptors:

Percent of device filled:	<25	25-50	>50
Condition:	Good	Fair	Poor

If the device is in POOR condition, the establishment will be issued a compliance order to have the device cleaned. The establishment will be required to contact Bangor WWTP to provide written verification the device has been properly cleaned.

BEST MANAGEMENT PRACTICES (BMPs)

1. Kitchen Operations

- *Train kitchen staff* and other employees to ensure BMPs are implemented.

People are more willing to support an effort if they understand the basis for it.

All of the subsequent benefits of BMPs will have a better chance of being implemented.

- *Post “No Grease” signs* above sinks and on the front of dishwashers.

Signs serve as a constant reminder for staff working in kitchens

These reminders will help minimize grease discharge to the grease control devices and reduce the cost of cleaning and disposal.

- *Use water temperatures less than 140° F* in all sinks, especially the pre-rinse sink before the mechanical dishwasher. If water hotter than 140°F enters a grease control device, the grease will liquefy and be carried out of the device into the sewer lines.

The MUPC prohibits the dishwasher discharging to grease control systems, unless specifically permitted by the Authority Having Jurisdiction (the City of Bangor).

- *Use the three sink dishwashing system*, which includes sinks for washing, rinsing and sanitizing in a 50-100 ppm bleach solution. Water temperature should be less than 140°F. (See above)

The food service establishment will reduce its costs for energy-gas or electric for heating the water for the mechanical dishwasher and operating the dishwasher.

- *Recycle waste cooking oil.*

There are many waste oil recyclers throughout Maine. This is a cost recovery opportunity. The food service establishment may be paid for certain waste material and will reduce the amount of garbage it must pay to haul away.

- ***Dry wipe pots, pans, and dishware prior to dishwashing***, disposing of wastes to solid trash.

The grease and food that remains in pots, pans, and dishware will likely go to the landfill. By dry wiping and disposing in garbage receptacles, the material will not be sent to the grease traps and interceptors, which will reduce the frequency of maintenance.

- ***Observe dishwashing practices.***
- ***Dispose of food waste by*** recycling and/or solid waste removal.

Some recyclers will take food waste for animal feed. In absence of such services, food waste can be disposed as solid waste in landfills by solid waste haulers.

Recycling food waste will reduce the cost of solid waste disposal.

Solid waste disposal of food waste will reduce the frequency and cost of grease control device cleaning.

2. **Properly Maintain Grease Control Devices to Prevent Discharge into the Sanitary Sewer**

- ***Witness all grease control device*** cleaning and maintenance activities to ensure the device is properly operating. Make sure to use the “25%” rule to determine cleaning frequency. Remember, if more than 25% of the capacity of the grease interceptor is taken up by the grease layer and the sludge layer combined, the device should be cleaned.

Witnessing the cleaning operation will assure the establishment is getting full value for service provided.

- ***Clean grease traps weekly.***

If grease traps are more than 50% full when cleaned weekly, the cleaning frequency needs to be increased. If the trap is located too close to a hot water source, the hot water may cause the grease to liquefy and be carried out to the sewer pipes, leaving the trap “clean”.

Weekly cleaning of grease traps by the establishment staff will protect the gravity grease interceptor and reduce the frequency of maintaining the interceptor.

Maintain cleaning records for a period of at least 2 years on site.

- ***Clean gravity interceptors routinely*** to ensure that grease accumulation does not cause the interceptor to operate poorly and discharge grease to the public sewer. A minimum frequency of at least twice per year is required; however, more frequent cleaning is often required to meet peak operational performance.

The cleaning frequency is a function of the type of food prepared, the size of the interceptor, and the volume of flow discharged by the establishment.

Routine cleaning will prevent plugging of the sewer line between the food service establishment and the sanitary sewer system. If the line plugs, sewage may back up into the establishment, leading to health consequences and operational costs.

* Remember, the combined total of the grease layer and sludge layer should be no more than 25% of the capacity of the interceptor.

- ***Clean FOG Disposal Systems as per manufacturer recommendations.***
- ***Keep a maintenance log*** on site for at least 2 years.

The maintenance log serves as a record of the frequency and volume of cleaning the grease control device and can help the establishment manager optimize cleaning frequency to reduce costs. It is required by the pretreatment program to ensure that grease control device maintenance is performed on a regular basis.

The food service establishment will provide copies of maintenance logs annually with the victualer license renewal.

3. Prevent Fats, Oil and grease From Entering Surface Waters or Storm Drains

- ***The City of Bangor has BMPs in place for stormwater protection,*** which require covering outdoor grease and oil storage containers.

Uncovered grease and oil storage containers can collect rainwater. Since grease and oil float, the rainwater can cause an overflow onto the ground. Such an overflow will eventually reach the stormwater system and nearby streams. This will degrade the water quality of the receiving stream.

Discharging grease and oil into storm drains is prohibited by City, State and Federal regulations. Failure to prevent the discharge of grease and oil into the storm drainage system may result in legal penalties and/or fines.

Inspect outside storage areas for signs of oil and grease spills. Make sure all covers are in place.

- ***Locate grease dumpsters*** and storage containers away from storm drain catch basins.

The farther away from the catch basin, the more time someone has to clean up spills.

Be careful to not allow oil or grease to drip onto the ground while being carried to the storage container.

- ***Spill controls extend below*** the water surface and trap floatable materials like oil and grease, preventing them from traveling further downstream. Check the nearest catch basin for signs of oil and grease.

Use absorbent pads or “socks” in the storm drain catch basins if grease or oil is present. Do not use free flowing material such as “kitty litter” or sawdust in a catch basin.

Notify the City Stormwater Coordinator at 992-4255 if grease or oil enters any stormwater catch basin.

- ***Routinely clean kitchen exhaust*** system filters.

If grease and oil escape through the kitchen exhaust system, it can accumulate on the roof of the establishment and eventually enter the storm drain system when it rains.

Establish a regular schedule of exhaust filter cleaning and maintain records on site for a minimum of 2 years.

PROHIBITIONS

1. ***Do not discharge fats, oil and/or grease*** in concentrations that will cause an obstruction to the flow in a sewer, or pass through or interference at the wastewater treatment facility. Grease can solidify and trap other solid particles to completely plug the wastewater collection system.

Do not discharge grease, improperly shredded garbage, animal guts or tissues, paunch, manure, bones, hide hair, fleshings, or entrails. These materials in combination or alone can cause blockages and other operation and maintenance problems in the wastewater collection and treatment system.

2. ***Do not discharge wastewater with temperatures*** in excess of 140°F to any grease control device. Temperatures in excess of 140°F will liquefy grease allowing it to by-pass the control device, but it will re-congeal as the carry water cools and adhere to pipe walls, causing blockages further downstream.

NOTE: High temperature wastewater, as from a dishwasher, may be discharged to a remotely located gravity grease interceptor with specific approval by the City. The remote location and large capacity of a gravity interceptor allows the water time to cool so that the grease will congeal, float and be captured within the unit.

3. ***Do not discharge waste from*** a food disposal system to any grease control device. Food waste will greatly reduce the capacity of the grease control device.

4. ***Do not discharge caustics,*** acids, cleaning solvents or other emulsifying agents. Though emulsifying agents can dissolve solidified grease, the grease can re-congeal further downstream in the sanitary sewer collection system.

Caustics, acids and solvents can have harmful on the wastewater treatment system and can be a hazard to employees working in the collection system.

5. ***Do not discharge fats, wax,*** grease or oils containing substances that will become viscous between 32°F (0°C) and 150°F (65°C).

The temperatures shown are temperatures that can occur in the wastewater collection and treatment system. If these substances congeal, solidify or become too viscous, they can cause blockages and other problems.

6. ***Do not clean equipment outdoors*** in an area where water can flow to the gutter, storm drain, or street. Grease and oil washed off equipment can enter the storm drain system and enter nearby streams.

GREASE CONTROL DEVICE MAINTENANCE

Grease trap (hydro-mechanical interceptors) and FOG disposal system maintenance is usually performed by food service establishment staff since the units are usually readily accessible and cleaning is relatively simple. **Gravity grease interceptor** maintenance is usually performed by permitted waste haulers or recyclers and consists of removing the entire contents of the interceptor and properly disposing of the material in accordance with all local, state and federal laws. When performed properly and at the appropriate frequency, grease control device maintenance can greatly reduce the discharge of fats, oil and grease (FOG) to the wastewater collection system.

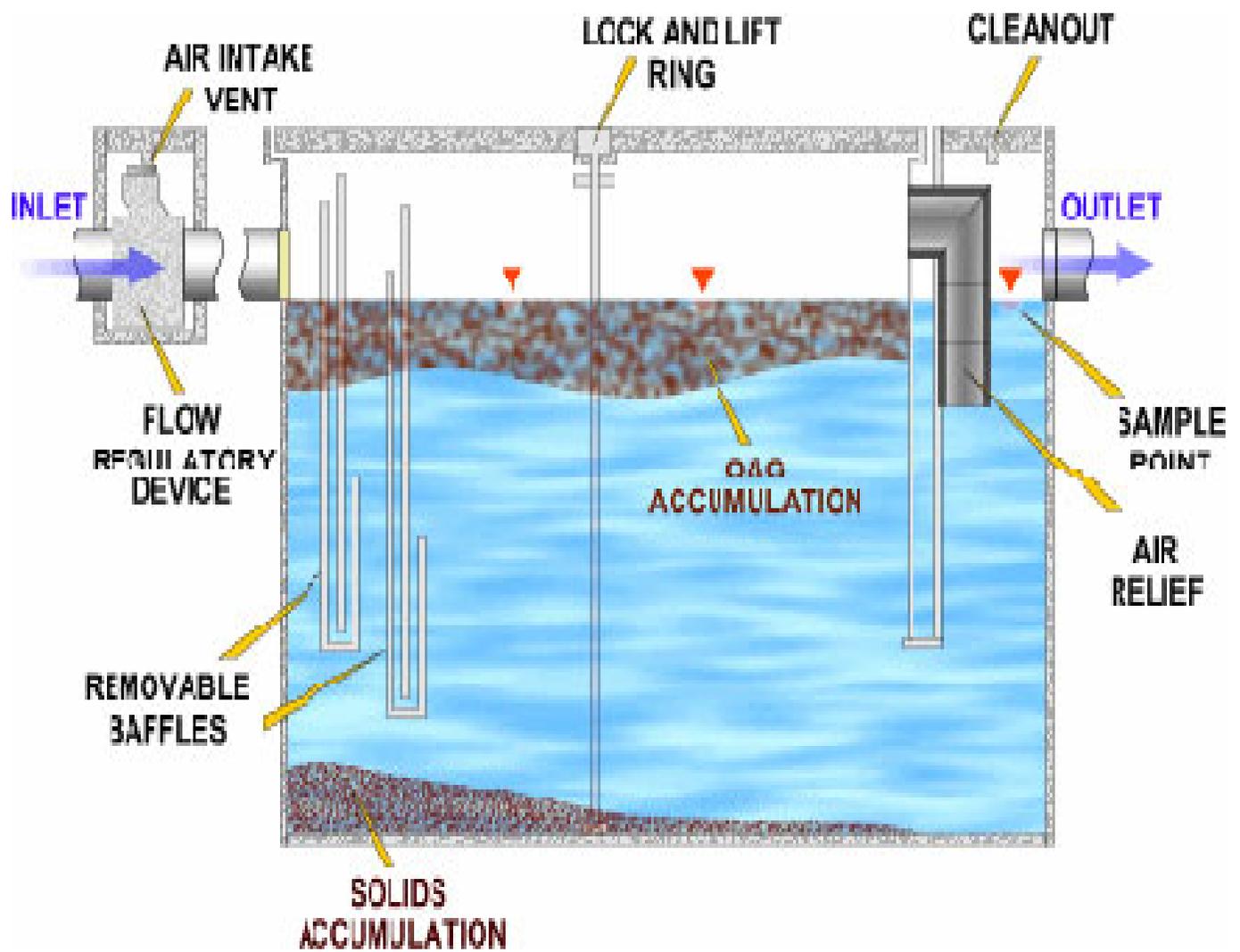
The required maintenance frequency for grease control devices depends greatly on the amount of FOG an establishment generates as well as recognized Best Management Practices (BMPs) that the establishment implements to reduce the FOG discharges. In many cases, an establishment that implements BMPs will realize financial benefit through reduction in grease control device maintenance frequency. Please refer to *Best Management Practices* for examples.

WARNING! Do not use hot water, acids, caustics solvents or emulsifying agents when cleaning grease control devices.

Proper maintenance procedure for a for a grease trap or hydro-mechanical interceptor (see illustration following)

1. Bail out any water in the unit. The water should be discharged to the sanitary sewer system.
2. Remove baffles if so designed.
3. Using a spoon or other tool dip the accumulated grease out of the interceptor and deposit in a watertight container.
4. Scrape the sides, lid, and the baffles removing as much of the grease as possible and deposit this also into the watertight container.
5. Replace the interceptor baffles and lid.
6. The grease and container may be placed into the solid waste stream or removed to a grease storage unit most often located outside the establishment. When the grease storage unit is full, contact your hauler or service provider for removal.
7. Record the volume of grease removed, date and person doing the service in your maintenance log.

Do not allow grease and sludge combined to exceed 25% of the capacity of the interceptor!



HOW A GREASE TRAP OR HYDRO-MECHANICAL INTERCEPTOR WORKS

1. Flow from 4 or fewer kitchen fixtures enters the grease trap
2. An approved flow control or restricting device is installed to restrict the flow to the rated capacity of the trap.
3. An air intake valve allows air into the open space of the trap to prevent siphonage and back pressure.
4. The baffles help retain grease towards the upstream end of the trap because grease floats on water, and when the trap is properly operating grease will not slip under the baffle. This action helps prevent grease from leaving the trap and moving into the pipes to solidify and cause blockages. The grease that accumulates behind the baffles will be removed during cleaning.
5. Solids in the wastewater entering the trap that do not float will be deposited on the bottom of the trap as sludge. Sludge must be removed during the cleaning of the trap.
6. Air relief is provided to maintain proper air circulation with the trap.
7. Some grease traps have a sample point at the outlet end of the trap to sample the quality of the effluent.
8. A cleanout is provided at the outlet or just downstream to provide access to the pipe for cleaning.
9. The water exits the grease trap through the outlet pipe and continues on to the gravity grease interceptor where it exists, or to the sanitary sewer.