



Fats, Oil and Grease (FOG) SECTOR CONTROL PROGRAM

City of Missoula
Wastewater Division
Pretreatment Program
435 Ryman Street
Missoula, Montana 59802

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Fats, Oil and Grease (FOG) Sector Control Program

I. Purpose

The purpose of this program is to minimize the loading of animal/vegetable fats, oil, and grease (FOG) entering the sanitary sewer collection system, the wastewater treatment plant, and storm water systems. FOG can contribute to sewer blockages, causing sewer overflows and backups, can interfere with equipment at lift stations and/or at the wastewater treatment plant, and contaminate storm water. In addition, the program will help ensure the City continues to meet the 10mg/L oil and grease limit to the receiving waterbody defined in the City's Storm Water Discharge General Permit and the Wastewater Treatment Plant Effluent Discharge Permit.

II. Introduction

What is FOG?

FOG refers to fats, oil and grease found in most residential and commercial kitchens. Waste FOG is a semisolid, viscous or liquid material that is generated during the food cooking process or during cleaning, maintenance, and sanitizing processes. Many foods that are processed and served contain FOG, including; meats, sauces, soups, gravies, dressings, deep fried foods, baked goods, cheeses, butter and many others. Residential users and businesses generate FOG wastes by processing or serving food, including; caterers, hospitals, churches, nursing homes, day care centers, schools, grocery stores, etc.

What's the problem with FOG, and why should it be managed?

Liquid wastes containing FOG that are discharged down the sewer drain can coagulate and congeal into a hardened layer on the inside of building drain pipes (private Service Lines) and wastewater Collection Lines (City owned mainlines). Over time this buildup of FOG causes a reduction in the diameter of pipes and reduces effectiveness of these pipes to transport wastewater away from residences and businesses and ultimately to the wastewater treatment plant. Liquid wastes containing FOG can accumulate on the inside of pipes to such an extent, that the pipes become completely blocked with FOG. When pipes become blocked, the normal flow of wastewater is obstructed, which can cause sewage to back up into residences and businesses upstream of the blockage.

If FOG originates from your residence and/or business, you may be the first one affected. These blockages can result in significant public health hazards as well as property damages. When pipes become blocked with FOG, untreated wastewater may also overflow out of the Wastewater Collection System into streets, parking lots, storm sewers, and ultimately to the environment.

According to Missoula City/County Environmental Health Department regulations, a public health hazard is created in the event a Food Service Establishment has a wastewater backup. The regulations require the business to shut down until the blockage has been cleared and the contaminated area properly sanitized. Any shut down creates an obvious disruption to the operation of the Food Service Establishment.

III. Definitions

Best Management Practices (BMPs)

Schedules of activities, prohibitions or practices, maintenance procedures, and other management practices; it also includes treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw materials storage.

Collection Line

That portion of the Wastewater Collection System within a network of public pipes which collects and conveys wastewater from Users to the wastewater treatment plant, excluding Service Lines.

Domestic User

Any private residential user that discharges wastes derived from ordinary living activities excluding any commercial or industrial wastes.

Drainage Footage Unit

A quantity of drainage in terms of which the load-producing effects on the plumbing system of different kinds of plumbing fixtures are expressed.

Fats, Oil, and Grease (FOG)

Non-petroleum fats, oil, and grease derived from animal or plant sources.

FOG Pretreatment Device/Grease Interceptor

A plumbing appurtenance or appliance such as a hydro-mechanical grease interceptor (HGI) or gravity grease interceptor (GGI) used to collect nonpetroleum fats, oil, and grease (FOG) prior to entering the Wastewater Collection System.

Food Service Establishment (FSE)

Commercial facilities partially or fully engaged in preparing and /or serving food for consumption by the public, such as restaurants, caterers, hospitals, churches, nursing homes, day care centers, schools, grocery stores, etc. FSEs are licensed through the Montana Department of Public Health and Human Services and reviewed and approved by the Missoula City/County Environmental Health Department.

Gravity Grease Interceptor (GGI)

A plumbing appurtenance or appliance that is used to collect non-petroleum FOG prior to entering the Wastewater Collection System and is identified by volume, thirty (30) minute retention time, baffle(s), not less than two (2) compartments, a total volume of not less than three-hundred (300) gallons, and gravity separation. Gravity grease interceptors are generally installed outside the footprint of a building.

Grease Removal Device (GRD)

Any hydro-mechanical grease interceptor that automatically, mechanically removes non-petroleum FOG from an interceptor, the control of which are either automatic or manually initiated.

High Temperature Dishwasher

A -dishwasher that uses hot water for sanitizing and has a final rinse temperate not less than 180°F(degrees Fahrenheit) or 160°F for a single-tank, stationary-rack, single-temperature machines.

Hydro-mechanical Grease Interceptor (HGI)

A plumbing appurtenance or appliance that is installed in a sanitary drainage system to intercept non-petroleum FOG from a wastewater discharge and is identified by flow rate, and separation and retention efficiency, listed as Types A-D below. The design incorporates air entrainment, hydro-mechanical separation, interior baffling, and/or barriers in combination or separately, and one of the following:

Type A - External flow control, with air intake (vent): directly connected

Type B - External flow control, without air intake (vent): directly connected

Type C - Without external flow control, directly connected

Type D - Without external flow control, indirectly connected

HGIs are generally installed inside a building.

Liquid Waste Hauler

Any person, firm, corporation or other entity that collects, pumps, transports and/or disposes of liquid waste.

Low Temperature Dishwasher

A dishwasher that uses chemicals for sanitization and has a final rinse temperature not less than 75°F.

Non-domestic User

Any user that does not meet the criteria for categorization as a domestic user shall be considered a non-domestic user.

Notice of Violation (NOV)

Notice given to a User who is in violation of this program and/or Missoula Municipal Code.

Publicly Owned Treatment Works (POTW)

A publicly owned treatment works includes any devices or systems used in the collection, storage, treatment, recycling, and reclamation of sewage and any conveyances, which convey wastewater to the treatment plant.

Service Line

The wastewater collector line extending from the wastewater disposal facilities of the premises up to and including the connection to the Collection Line.

User

Any person who contributes, causes, or permits the contribution of wastewater into the POTW.

Wastewater Collection System

All pipes, tanks, lift stations, pumps and appurtenances that convey wastewater from residences and businesses (connected to the system) to the wastewater treatment plant. The system includes all private and public infrastructure.

Waste Grease Bin (WGB)

Any receptacle used to store waste grease collected from fryers, grills, woks and other similar devices.

IV. Acronyms

ASME - American Society of Mechanical Engineers
BMPs - Best Management Practices
CO - Compliance Order
DFUs - Drainage Fixture Units
FOG - Fats, Oil, and Grease
FSE - Food Service Establishment
GGI - Gravity Grease Interceptor
GRD - Grease Removal Device
HGI - Hydro-mechanical Grease Interceptor
PDI - Plumbing and Drain Institute
POTW - Publicly Owned Treatment Works
NOV - Notice of Violation
UPC - Uniform Plumbing Code
WGB - Waste Grease Bin

V. Scope

This policy covers the City of Missoula's service area and all connections to the Wastewater Collection System whether within or outside the City Limits.

VI. Applicability

This program does not apply to Domestic Users. However, the best management practices (BMPs) set forth in this program are recommended for Domestic Users to assist in keeping the Wastewater Collection System flowing freely.

This program applies to any Non-domestic User connected to or planned for connection to the Wastewater Collection System that is required to have a Food Service License through the Missoula City/County Environmental Health Department.

Exemptions from any grease pretreatment device requirement:

- a. Facilities that have 2 or fewer staff each shift,
- b. Have no dining or food prep on site, and
- c. The primary purpose and income of the business is drive through coffee service.

VII. Identifying Applicable Users

1. Plans Review

All new facilities or existing facilities undergoing a remodel are required to submit engineered drawings (building plans) for review through Development Services. Plan review personnel shall determine the need of a FOG Pretreatment Device based on the nature of the business.

2. Missoula City-County Environmental Health Department Referral

The Health Department informs Development Services and Wastewater Division staff of any new FSEs. The Health Department will also communicate to Development Services and Wastewater Division knowledge of change of ownership and/or change of use for existing FSEs. The Industrial Interceptor Requirement Variance Committee will review the information available and determine the need of a FOG Pretreatment Device based on the significance of the FSE and its associated changes. This review may involve requesting additional information from the owner or operator of the FSE.

3. Finance Department Referral

Business License Issuance/Renewal application that indicates a new business going into an existing or new building or an existing business with an address change triggers review by the Industrial Interceptor Requirement Variance Committee for adherence to pretreatment requirements. The committee will determine if the location meets minimum requirements for applicable businesses under this program based on the business activity and review of sewer records.

VIII. FOG Pretreatment Device/Grease Interceptor Requirements

This section describes the requirements for all applicable Users. All Users positively identified above as having the potential to generate grease shall be required to install a Gravity Grease Interceptor or a Hydro-mechanical Grease Interceptor.

1. Gravity Grease Interceptor (GGI) Criteria

A. Plumbing

All sinks, floor drains, floor sinks, mop sinks, disposals, dishwashers (except high temperature dish washers) and other plumbing fixtures in kitchens, bars, bussing stations, and other food service areas into which wastewater containing FOG may be introduced must be connected to the GGI. Water closets, urinals, and other plumbing fixtures conveying human waste (black water) shall not drain into or through the GGI.

Each business establishment for which a GGI is required shall have a GGI serving only that establishment. Common or shared GGIs are only permitted if both facilities are located on the same parcel and the resulting discharge does not exceed the 100 mg/L for oil and grease as required by the Missoula Municipal Code.

All GGIs and associated plumbing shall be installed by a licensed plumber or contractor.

GGIs are allowed in the public right-of-way at a location that is approved by the City Engineer.

- i. Garbage Grinders/Food Waste Units and Dishwashers
Low temperature dishwashers and garbage disposals are required to drain into a gravity grease interceptor.

High temperature dishwashers may be allowed to bypass a gravity grease interceptor under certain circumstances. Consult with the City's Plumbing Inspector for final determination.

B. Design

All GGI shall meet the standards set forth in City of Missoula Standard Drawing 314. Alternative Gravity Grease Interceptors may be allowed through the building plan review and approval process.

All GGIs must have two compartments separated by a baffle wall. The primary compartment shall have a volume equal to two thirds of the total capacity, and the secondary compartment shall have a volume equal to one-third of the total capacity. Each compartment shall be accessible by a traffic rated manhole above the inlet and outlet piping with a minimum diameter of 24 inches. Manhole covers may not be locked, or otherwise fastened in place such that access is restricted. All plumbing shall be compatible with food service wastewater, such as PVC. A sampling-T shall be placed at the outlet end of the GGI to allow sampling of effluent. The bottom of the outlet piping must extend down 12 inches above the base of the GGI. Flow from the primary to secondary compartment shall be through a PVC Tee equivalent in cross sectional area to the inlet piping into the GGI, and shall extend down in the primary compartment of the GGI with a height above the base 12 inches. Supports brackets may be necessary in order to align the outlet piping with the manhole for sampling access. Clean outs and venting shall be PVC. Vents shall be independent of any other building venting system and shall be in accordance with the most recently adopted edition of the UPC.

See City Engineering [Standard Drawing 314](#)

C. Sizing

Certain kitchen fixtures are required for all Food Service Establishments. Sizing of GGIs are based on all planned kitchen fixtures being connected to the GGI. To size GGIs, refer to the most recently adopted edition of the UPC by the City of Missoula.

D. Location

Each GGI shall be installed and connected so as to be easily accessible at all times for inspection, cleaning, pumping, and maintenance. Each GGI manhole cover shall be readily accessible and safely removable for servicing and maintaining the GGI. Specific locations within rights-of-ways must be approved by the Engineering Division.

E. Maintenance

GGIs shall be maintained, at the expense of the User, by regularly scheduled pumping to ensure the proper operation necessary to efficiently intercept the FOG from the User's wastewater and prevent the discharge of said materials into the Wastewater Collection System. A GGI shall be serviced at a minimum of every 90 days or more frequently as needed to ensure that the total accumulation of FOG and settled solids does not exceed twenty-five percent (25%) of the GGI's total capacity. The Wastewater Division Pretreatment Program may allow a less frequent pumping schedule if the user can demonstrate the GGI does not need to be pumped every 90 days. All Users are required to structurally maintain all components of their GGI(s) as per the design requirements defined in Standard Drawing 314 and this document.

Maintenance of GGI(s) shall be performed by a business or professional normally engaged in the servicing of such plumbing fixtures. Partial removal of contents (i.e., removal of only the grease layer, oil layer or sludge layer) is not allowed. Contents removed from GGIs shall be hauled off-site and disposed of properly. Under no circumstances shall GGI contents be reintroduced to the sanitary sewer system. The user must take reasonable steps to assure that all waste is properly disposed of at a facility in accordance with federal, state and local regulations (i.e. through a certification by the hauler included on the waste manifest or trip ticket for each load). Users are ultimately responsible for the maintenance, servicing, and proper waste disposal and cannot transfer this responsibility to a contractor, pumping service, or any other agent.

All records, receipts, and manifests of GGI maintenance, removal of GGI contents, and off-site hauling of FOG waste including waste grease bin (WGB) contents shall remain on-site and accessible for review by City personnel for a minimum of three (3) years. The City may require a user that falls under the provisions of this policy to submit copies of all records, receipts, and manifests of GGI and/or WGB maintenance, removal of GGI and/or WGB contents, and off-site hauling of FOG waste.

In the event a GGI is not properly maintained by the user, the Wastewater Division Pretreatment Program may authorize such maintenance work to be performed on behalf of the user. The costs of such maintenance shall be billed directly to the User and shall become part of the charges due and owing to the City and shall constitute a lien against the property until paid in full.

Biological treatment or enzyme treatment shall not be a substitute for the servicing of a GGI.

2. Hydro-mechanical Grease Interceptor (HGI) Criteria

A. Plumbing

Dish sterilizers and clear waste lines are not required to connect to a HGI. Dish washing pre-wash sinks must be connected to a HGI and must not have a garbage grinder. Food service area plumbing fixtures into which wastewater containing FOG may be introduced must be connected to the HGI. Water closets, urinals, and other plumbing fixtures conveying human waste (black water) shall not drain into or through the HGI.

- i. Garbage Grinders/Food Waste Disposal Units and Dishwashers
Garbage grinders or food waste disposal units are allowed but not preferred to discharge to a HGI grease pretreatment device. If desired by a FSE, an inline solids separator shall be installed prior to discharge into the approved HGI. However, if a particular brand of HGI can accommodate food waste solids, per the manufacturer's guidelines, then the inline solids separator may be omitted.
Low temperature dishwashers are allowed to drain into a HGI. High temperature dishwashers are required to bypass a HGI. Low temperature dishwashers use water that is less than or equal to 120 degrees.

B. Design

There are a variety of designs and manufacturers for HGIs. Any selected brand must meet standards and be certified as is defined in the most recently adopted edition of the UPC by the City of Missoula. Summary of documents identifying standards are identified in the table below.

| Standard Number | Standard Title | UPC Reference Section | Description/Scope |
|----------------------------|--|-----------------------|---|
| ASME A112.14.4-2001(r2007) | "Grease Removal Devices" | 1014.2 | Establishes requirements for grease interceptors that are equipped with automatic grease removal devices (GRD) |
| ASME A112.14.3-2001(R2004) | "Grease Interceptors" | 1014.1, 1014.2 | Covers general product requirements as well as the performance criteria for the testing and rating of grease interceptors, whose rated flows are 100 gpm or less. |
| ASME A112.14.6-2006 | "FOG (Fats, Oil, and grease) Disposal Systems". | 1015.4 | Establishes requirements for FOG disposal systems |
| PDI G-101-2007 | "Testing and Rating Procedure for Type 1 Hydro Mechanical Grease Interceptors with Appendix of Installation and Maintenance" | 1014.4, 1014.2.1 | Provide a sizing method expressed as GPM flow, capacity retention in pounds, and test protocol for sizing and testing the grease interceptor to known proven test requirements. |

C. Sizing

- i. General
Refer to the most recently adopted edition of the UPC by the City of Missoula for HGI sizing except for the following:
 - a. Dishwasher connection

For HGI sizing, dishwasher flow will be used directly and not converted to DFUs. (See VIII.2.a.i for dishwasher requirements.)

- b. 3-compartment sink connection
For HGI sizing, 3-compartment sink flow will be used directly and calculated at a 1-minute flow rate. The following equation is the formula for determining flow rate from a 3-compartment sink:

$$\frac{\text{Sum of cubic inches of all 3-compartments} \times 0.75 \text{ fill factor}}{231} = \text{Load (gallons)}$$

D. Location

Each HGI shall be so located that it is easily accessible for inspection, cleaning, and removal of the intercepted grease, preferably near a door for optional third party cleaning.

E. Maintenance

Maintenance, including frequency of cleaning, must be followed per manufacturer's recommendation.

~~**IX. Variance from the Requirement to Install a FOG Pretreatment Device or Connecting All Kitchen Fixtures to a HGI**~~

~~A variance to the requirements to install a gravity grease interceptor may be granted by the City for low grease-generating food service establishments (FSEs). The applicant has the burden of proof of demonstrating, by means of submitting data and other pertinent information with the variance application (Appendix 5-C) why a variance should be granted. The effluent limit specified in Missoula Municipal Code may not be violated even if a variance is granted. The granting of any variance shall be at the sole discretion of the City as represented by the Grease Interceptor Variance Committee. Each variance application includes an application fee, as shown in the Engineering Fee Schedule. For FSEs submitting a variance application, building plans will not be approved until the application is submitted and the committee makes a decision. If a variance is granted, the user shall install hydraulic grease interceptors HGI(s), institute BMPs, and any other mitigation measures as determined by the committee.~~

IX. Best Management Practices (BMPs)

The purpose of BMPs is to minimize the discharge of FOG into the sewer systems. The following BMPs shall be implemented by non-domestic users to whom this policy applies. This includes employee training and kitchen practices that are essential in minimizing FOG discharges:

- Segregation and collection of waste cooking oil and grease:
All waste cooking oil and grease shall be collected and stored properly in waste grease bins (WGBs) or similar devices. Such WGBs shall be maintained to ensure that they do not leak and are weather-tight. WGBs shall be pumped before they are 90% full by a licensed waste hauler or an approved recycler to dispose of waste cooking oil and grease. Waste hauling manifests shall be retained onsite for three (3) years.
- Disposal of food waste:
Food wastes shall be disposed of directly into the trash or garbage and not in the drain.
- Kitchen signage:
Signs shall be posted above all sinks prohibiting the discharge of oil, grease, and food waste down the drains.
- Employee training:
Employee training shall be provided as part of the normal orientation process and annually thereafter including, at a minimum, the following subjects:
 - How to scrape excess food into the garbage and “dry wipe” or scrape pots, pans, dishware and work areas before washing to remove grease.
 - The location, use, and disposal of absorption products to clean under fryer baskets and other locations where grease may be spilled or dripped.
 - How to properly dispose of grease or oils from cooking equipment into a grease receptacle.
 - The need for and cleaning of drain screens.

- Spill Prevention:
All Users are required to have measures in place to control unwanted FOG discharge to the sanitary sewer and, when applicable, storm drain. Chemicals, cooking oils, and other liquid products must be stored away from drains or within a containment to reduce the potential for spill reaching the sanitary sewer and/or storm drain system.

XI. Enforcement

The City's Enforcement Response is based on the nature and severity of the violation, compliance history, as well as the good faith effort made by the FSE. The focus of this program is education however per MMC 13.07.260 C enforcement will occur for those FSEs who, after being informed, continue to violate the requirements of the FOG Sector Control program. Enforcement will be carried out as follows:

| Violation | Circumstances | Enforcement Response | Comment |
|---|---|---|---|
| <ul style="list-style-type: none"> • No written records of maintenance of HGI or GGI • HGI or GGI not maintained • WGB inadequately maintained or not present • Staff not trained on FSE BMPs | 1 st offense or isolated incidence | Verbal | Informal Response; educational material will be provided to owner and/or staff |
| | 2 nd offense | Notice of Violation (NOV) with corrective actions | Formal written response |
| | Recurring offense | Compliance Order (CO) with specifications that the user come into compliance within a specified time period | May also include administrative fines up to \$1,000 per day and or Suspension of services |

XII. Loan Program

Per Missoula Municipal Code (MMC) 3.18 "Sewer Connection and Grease Interceptor Expense Relief Loan Program" property owners desiring or being required to install an external grease interceptor for a FSE in an existing building retro-fit/remodel are eligible for a loan of up to \$20,000. Applicants for a loan must submit the following information:

- The cost of the purchasing and installation of the external grease interceptor and appurtenances shall be submitted to the City Engineer as a written quote from a licensed and bonded excavation contractor who will be completing the construction work.
- A statement to the fact, that he, she or they are the owner(s) of the property upon which relief is sought.
- An affidavit stating that he, she or they meet the criteria set forth in Section 3.18.045(Only real property owners desiring or being required to install an external grease interceptor for a food service establishment in an existing building retro-fit/remodel are eligible for this loan program).

Details of the program and loan repayment requirements can be found in the MMC 3.18.

XIII. Other References

The Plumbing and Drainage Institute – Guide to Grease Interceptors *Eliminating the Mystery*

For questions relating to installation and sizing of grease interceptors, contact the City's Plumbing Inspector at (406) 552-6630.

For questions relating to pretreatment requirements, contact the Wastewater Pretreatment Supervisor at (406) 552-6606.