

CITY OF  
**FLAGSTAFF**  
SERVICE AT A HIGHER ELEVATION

Fats, oils and grease (FOG)  
Discharge Control Manual

November 2019

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## Section 1: Purpose and General Provisions

### 1.1 Statement of Purpose

The purpose of this manual is to enhance beneficial public use of the City of Flagstaff, AZ sewer facilities, prevent blockages of sewer lines resulting from discharges of fats, oils, grease (FOG) and other constituents to the sewer facilities. This manual specifies appropriate FOG requirements for Food Service Establishments (FSEs) and/or property owners where they are located and supports such entities in implementing a cost-effective FOG abatement program. The manual establishes quantity and/or quality standards on all wastewater and/or waste discharges containing FOG as these cause or contribute to the occurrence of sanitary sewer overflows (SSOs), affect treatment plant operations, and increase publicly owned treatment works costs.

In accordance with Title 40, Code of Federal Regulations (40 CFR), Part 403 and the Flagstaff City Code, Chapter 7-02 Wastewater Regulations, Section 7-02-001-0014, as amended, the City of Flagstaff (hereafter called City) is authorized to determine the compliance status of all FSE/property owners with respect to their discharge of FOG (either vegetable or animal origin) either directly or indirectly into the City's wastewater collection system.

The following rules reflect requirements of the State and Federal government, including the Flagstaff City Code, Chapter 7-02 Wastewater Regulations, Section 7-02-001-0014, as amended, and the City's Arizona Pollution Discharge Elimination System (AZPDES) permit issued by the State of Arizona Department of Environmental Quality (ADEQ). The purpose of these rules is to set forth uniform requirements for users of the City's wastewater collection and treatment system in order to enable the City to comply with all applicable State and Federal laws required by the Federal Water Pollution Control Act, as amended, and by requiring commercial and industrial users to comply with the General Pretreatment Regulations in 40 CFR Part 403, as amended.

### 1.2 Applicability

The following regulations apply to all food service establishments (FSEs) and properties where FSEs are located, both commercial and/or industrial, having any type of process providing food and/or drink for consumption or manufacturing process that includes the use of or discharge of FOG.

Any pretreatment systems or grease interceptors used to treat FOG shall be approved by the City and shall be designed, constructed, installed and maintained such that they comply with all applicable Federal, State and/or City discharge limits and with all City policies and rules, as amended.

### 1.3 Disclaimer

Any reference contained in this Manual to a specific product, type of product, process or service does not constitute or imply an endorsement by the City of that specific product, type of product, process or service.

## Section 2: Definitions

2.1 **Best Management Practices (BMP);** Schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the introduction of pollutants, including Fats, Oils and Grease (FOG) to the sewer facilities.

- 2.2 **Change in Operations;** Any change in the ownership, food types, operational procedures, pretreatment devices or plumbing at an FSE/property.
- 2.3 **Commissary;** a base of operations for all mobile food establishments.
- 2.4 **Discharger;** Any establishment that discharges or causes a discharge of wastewater directly or indirectly to a public sewer.
- 2.5 **Effluent;** Any liquid outflow from the food service establishment that is discharged to the sewer.
- 2.6 **ERP;** the City's approved enforcement response plan.
- 2.7 **Fats, Oils and Grease (FOG);** organic polar compounds derived from animal and/or plant sources as detectable in cooking oils, food scraps containing grease, butter or oil, lard or tallow, meat fat, grease and juices, gravies, sauces, shortening and dairy products.
- 2.8 **Food Service Establishment (FSE);** Facilities maintained, used, or operated for the purpose of storing, preparing, serving, manufacturing, packaging, or otherwise handling food for sale to other entities, or for consumption by the public, its members, residents, students or employees, and which has any process or device that uses or produces FOG, or grease, vapors, steam, fumes, smoke or odors, including any real property on which the FSE is located.
- 2.9 **Food Waste Disposer, Food Grinder or Garbage Grinder (FWD);** Any device installed in the plumbing or sewage system for the purpose of grinding food waste or food preparation waste.
- 2.10 **Grab Sample;** A sample taken from a waste stream on a one-time basis without regard to the flow in the waste stream and without consideration of time.
- 2.11 **Gravity Grease Interceptor (GGI);** A multi-compartmental plumbing apparatus or appliance, constructed in differing sizes, installed underground and outside the FSE, connected to a sanitary drainage system to intercept FOG from a wastewater discharge and is identified by liquid volume, thirty-minute retention time, baffle(s), a minimum of two compartments, and gravity separation.
- 2.12 **Grease interceptor;** Any gravity grease interceptor, hydromechanical grease interceptor or other mechanism, device, or process, which attaches to, or is applied to, wastewater plumbing fixtures and lines, the purpose of which is to trap or collect FOG prior to it being discharged into the sewer system. Grease interceptors may also include any other proven physical method to reduce FOG subject to the approval of the City.
- 2.13 **Hot Spots;** Public sewer lines or lift stations that have experienced sanitary sewer overflows or that must be cleaned or maintained frequently to avoid blockages of the public sewer system.
- 2.14 **Hydromechanical Grease Interceptor (HGI);** A plumbing apparatus or appliance typically installed inside an FSE in a sanitary drainage system to intercept FOG from the wastewater discharge, and is identified by flow rate, separation and retention efficiency. The design incorporates air entrainment, hydromechanical 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.
- 2.15 **Interference;** Any discharge which, alone or in conjunction with discharges from other sources, inhibits or disrupts the City sewer system, treatment processes or operations; or is a cause of

violation of the City's NPDES permit or discharge requirements or prevents lawful biosolids use or disposal.

- 2.16 **IPC**; International Plumbing Code
- 2.17 **Jetting**; high pressure water or steam used for cleaning or unblocking piping
- 2.18 **Limited Food Preparation Establishment**; An FSE/property engaged only in reheating, hot holding or assembly of ready to eat food products with no wastewater discharge. A limited food preparation establishment does not include any operation that changes the form, flavor, or consistency of food, nor are any clean-up processes performed.
- 2.19 **Manifest**; The receipt which is retained by the generator of wastes for disposing of liquid wastes as required by the City.
- 2.20 **MS4**; Municipal Separate Storm Sewer System.
- 2.21 **New Construction**; Any structure planned or under construction for which a sewer connection permit has not been issued.
- 2.22 **NPDES**; National Pollutant Discharge Elimination System; the permit issued to control the discharge of liquids or other substances to surface waters of the United States as detailed in Public Law 92-500, Section 402.
- 2.23 **Participating Pumper**; A scavenger waste hauler meeting the criteria of the Participating Pumper Program in the event one is established by City.
- 2.24 **Person**; Any individual, partnership, firm, association, corporation or public agency, including the State of Arizona and the United States of America.
- 2.25 **POTW**; Publicly Owned Treatment Works. Inclusive term for a treatment plant and collection infrastructure involved in delivering and treating domestic sewage.
- 2.26 **Property Owner**; The legal owner of the physical space at which an FSE is located.
- 2.27 **Public Sewer**; A sewer owned and operated by the City, or other local public agency, which is tributary to the City sewer facilities.
- 2.28 **Pumper**; A scavenger waste hauler who removes and disposes of FOG from grease interceptors, or performs activities that may discharge FOG to the public sewer (i.e., FSE line maintenance , or jetting).
- 2.29 **Remodeling**; Changes at an FSE/property involving any one or combination of the following: (1) any change in plumbing; (2) any increase in the net public seating area; (3) any change in the size of the facility and/or kitchen area; or (4) any change in the size or type of food preparation equipment; (5) changing and/or replacing any grease interceptor.
- 2.30 **Sample Point**; A location approved by the City, from which wastewater can be collected that is representative in content and consistency of the entire flow of wastewater being sampled.
- 2.31 **Sampling Facilities/Inspection Port**; Structure(s) provided at the user's expense for the City or user to measure and record wastewater constituent mass, concentrations, collect a representative sample, or provide access to plug/terminate the discharge.
- 2.32 **Scavenger Waste Permit**; A permit issued by the City, subject to the requirements and conditions established by the City, authorizing a pumper to perform FOG abatement activities within the City's jurisdiction.

- 2.33 **Sewer Facilities or System;** Any and all facilities used for collecting, conveying, pumping, treating, and disposing of wastewater and sludge.
- 2.34 **Sludge;** Any solid, semi-solid or liquid decant, subnate or supernate from a manufacturing process, utility service, or pretreatment facility.
- 2.35 **SSO;** Sanitary Sewer Overflow
- 2.36 **Waste;** Sewage and any and all other waste substances, liquid, solid, gaseous or radioactive, associated with human habitation or of human or animal nature, including such wastes placed within containers of whatever nature prior to and for the purpose of disposal.
- 2.37 **Waste Hauler;** Any person carrying on or engaging in vehicular transport of waste as part of, or incidental to, any business for that purpose.
- 2.38 **Waste Minimization Practices;** Plans or programs intended to reduce or eliminate discharges to the sewer system or to conserve water, including, but not limited to, product substitutions, housekeeping practices, inventory control, employee education, and other steps as necessary to minimize wastewater produced.
- 2.39 **Wastewater;** The liquid and water-carried wastes of the community and all constituents thereof, whether treated or untreated, discharged into or permitted to enter a public sewer.

### Section 3: Prohibitions

- 3.1 No person (FSE owner/operator) shall discharge or cause to be discharged into the sewer system FOG that may accumulate and cause obstruction to the flow or contribute to blockages in the sewer system or at the sewer lateral that connects the FSE/property to the sewer system.
- 3.2 No person (FSE owner/operator) shall discharge wastewater with temperatures in excess of one hundred forty (140°F) to any grease interceptor. When needed, a cold water regulator must be installed prior to the grease interceptor in order to achieve temperatures below 140°F.
- 3.3 No person (FSE owner/operator) shall use any additives (including but not limited to enzymes, bacteria, solvents, surfactants, caustics, acids or emulsifiers) for the purpose of emulsifying FOG or passing FOG through a grease interceptor.
- 3.4 No person (FSE owner/operator) shall dispose of waste cooking oil into any drainage pipe. All waste cooking oils shall be collected and stored properly in receptacles such as barrels or drums for recycling or other acceptable methods of disposal.
- 3.5 Wastes from toilets, urinals, or any other restroom area fixture/drain containing fecal materials is prohibited from being discharged to a grease interceptor and must be discharged directly to the sanitary sewer system.
- 3.6 Food waste disposers/garbage grinders (FWD) are prohibited.
- 3.7 Discharge of waste (including FOG and solid materials removed from grease interceptors), passive or actively (also known as “jetting”), to the sewer system is prohibited. FSE/property owners will be held financially responsible for jetting activities occurring on their property that discharge FOG or cause SSOs or other downstream obstructions to the sanitary sewer.
- 3.8 Unless approved by the City, FOG removed from grease interceptors is prohibited from remaining at the FSE/property owner’s site. FSE owner/operators shall have waste hauled offsite as part of their operation and maintenance requirements.



- 3.9 FOG-laden wash water from any clean-up process at an FSE/property is prohibited from being discharged to the MS4.
- 3.10 Owner/operators of mobile restaurants, food stands and coffee kiosks are prohibited from discharging any cooking process or clean-up wastewater to the MS4. Any wastewater must be discharged to a grease interceptor at the restaurateur's commissary. The activities of "stacking" and/or "decanting" are prohibited. Any person (pumper, property owner or FSE operator) engaging in such practices shall be subject to the enforcement provisions in Section 9 of this manual.
- 3.11 Discharging Grey water from inside a vacuum truck (decanting) into a grease interceptor, public sewer or MS4 is prohibited.
- 3.12 Flushing previous contents from a vacuum truck into the next grease interceptor serviced in order to transport less material in the truck (stacking) is prohibited.

## Section 4: Owners/Operators of FSEs Shall Meet the Following Pretreatment Requirements

- 4.1 Unless granted a waiver (see Section 9), all FSEs/Property Owners are required to install, operate and maintain an approved and adequately sized grease interceptor capable of maintaining compliance with the objectives of this manual. The grease interceptor shall be adequate to separate and remove FOG contained in wastewater discharges from FSE/property prior to discharge to the sewer system and enable the FSE/property owner to sustain a realistic and manageable site specific FOG abatement maintenance program as defined and set by the City.
- 4.2 Unless otherwise approved by the City, all fixtures, equipment, and drain lines located in the food preparation, alcohol service, clean-up and food service areas of an FSE/property shall be connected to a grease interceptor. Fixtures required to connect to a grease interceptor shall include but are not limited to pot sinks, pre-rinse sinks, hand sinks, prep sinks, dishwashers, soup kettles, braising pans, wok ranges, mop sinks, floor sinks, floor drains, and wastewater generated from exhaust fan hood cleaning operations.
- 4.3 Grease interceptors shall be subject to the requirements of section 5 of this manual and sized and selected in accordance with Appendix A: Grease Interceptor Sizing and Selection.
- 4.4 Commissary's must have a grease interceptor sized to handle the loading from their own kitchen operations as well as all permitted mobile food trucks that are approved for discharge at their specific location. The grease interceptor shall be determined in accordance with Appendix A: Grease Interceptor Sizing and Selection.
- 4.5 On or after the effective date of this manual the City may require an existing FSE/property owner to install, operate and maintain a new grease interceptor that complies with the requirements of this manual or to modify, repair or replace a non-compliant grease interceptor within 90 days of written notification by the City when any one or more of the following conditions exist:
  - 4.5.1 The facility is found to be contributing FOG to the collection or POTW systems;
  - 4.5.2 The facility does not have a grease interceptor;
  - 4.5.3 The facility has an undersized or defective grease interceptor;
  - 4.5.4 Remodeling of the food service areas, kitchen waste plumbing or seating capacity is performed, which requires a building and/or plumbing permit to be issued by the City;

- 4.5.5 The facility changes their menu;
  - 4.5.6 The existing facility is sold or undergoes a change of ownership; and/or
  - 4.5.7 The existing facility does not have plumbing connections to a grease interceptor in compliance with the requirements of current building codes or with this manual.
- 4.6 No landscaping or obstructions are allowed within three (3) feet of any access points or manhole covers of any grease interceptor located outside the FSE. Any grease interceptor located inside the facility must be free from obstructions or barriers to access.

## Section 5: Installation, Operation and Maintenance Standards for Grease Interceptors

- 5.1 Unless otherwise approved, GGIs shall not be installed. When approved by the City for installation (see Appendix B: Alternate Grease Interceptor Approval Request Form), GGIs shall be designed and tested in accordance with IAPMO/ANSI Z1001. GGIs are recommended to be made from materials that are compatible with a pH of 3 to preserve the integrity and longevity of the interceptor. GGIs made from materials that are subject to corrosion such as concrete or steel, should be lined or coated with a durable material approved by the City that is compatible with a pH of 3 and that cannot be easily penetrated, scraped away or removed. GGIs shall have inlet and outlet connections inside the tank, that are open-topped and extend at least five (5) inches above the liquid surface, allowing for visual inspection of influent and effluent. Inlet fittings shall extend below the liquid surface and outlet fittings shall extend to within 12 inches of the floor of the tank. Installation of GGIs shall be in accordance with manufacturers installation instructions. Sizing of GGIs shall be in accordance with Appendix A: Grease Interceptor Sizing and Selection.
- 5.2 Unless otherwise approved, AGRUs shall not be installed. When approved for installation (see Alternate Grease Interceptor Approval Request Form), AGRUs must be designed and tested in accordance with ASME A112.14.4 and/or CSA B481.5. Installation shall be in accordance with manufacturers installation instructions. Sizing of AGRUs shall be in accordance with Appendix A: Grease Interceptor Sizing and Selection.
- 5.3 HGIs must be designed and tested in accordance with ASME A112.14.3, PDI G101 and/or CSA B481.1. HGIs are recommended to be made from materials that are compatible with a pH of 3 to preserve the integrity and longevity of the interceptor. HGIs made from materials that are subject to corrosion such as steel, should be lined or coated with a durable material approved by the City that is compatible with a pH of 3 and that cannot be easily penetrated, scraped away or removed. Installation of HGIs shall be in accordance with manufacturers installation instructions. Sizing of HGIs shall be in accordance with Appendix A: Grease Interceptor Sizing and Selection.
- 5.4 Grease interceptor covers shall be secured in place at all times with tamperproof fasteners or shall be constructed of cast iron frame and cover weighing at least 70 pounds. When buried, covers shall be flush with grade. For indoor buried installations, covers shall be rated for pedestrian traffic and be installed in accordance with manufacturers instructions. For outdoor installations in non-vehicle traffic areas, covers shall be rated for light duty (2,500 – 16,000 lbs). For outdoor installations in vehicle traffic areas, covers shall meet AASHTO M306 H20/HS20.
- 5.5 Modification of a grease interceptor or components of a grease interceptor is not allowed unless approved by the City.



- 5.6 All grease interceptor's shall be maintained in efficient and proper working operation at all times by the owner at the owner's expense and shall include removal of both floatable solids, FOG and settleable solids collected in the grease interceptor along with cleaning the walls and baffles of the device. The maintenance frequency shall be established such that FOG or food solids do not leave the grease interceptor and enter the sanitary sewer collection system.
- 5.7 Self-cleaning by the owner and/or operator of an establishment is not allowed unless approved by the City (see Appendix C: Alternate Maintenance Approval Request). Only hydromechanical grease interceptors (HGI) with a liquid volume of less than 100 gallons may be considered for self-cleaning. When approved, the owner and/or operator of an establishment shall comply with the requirements for cleaning and disposal in accordance with Appendix C.
- 5.8 Frequency of cleaning will be determined on an individual basis by the City based on Appendix A: Grease Interceptor Sizing and Selection. The pumpers, FSEs and property owners are responsible for requesting a FOG inspection for changes or alterations to the cleaning schedule. Such changes/alterations must be approved by the City before being enacted. If no maintenance frequency has been set by the City, the following minimum service frequencies shall apply:
  - 5.8.1 The maximum amount of time between pump outs for a grease interceptor with liquid volume less than 100 gallons shall be no more than 30 days.
  - 5.8.2 The maximum amount of time between pump outs for a grease interceptor with liquid volume between 100 and 500 gallons shall be no more than 60 days.
  - 5.8.3 The maximum amount of time between pump outs for a grease interceptor with liquid volume greater than 500 gallons shall be no more than 90 days.
- 5.9 When cleaning a grease interceptor, the following shall apply:
  - 5.9.1 Remove cover(s)
  - 5.9.2 Remove all fats, oils, and grease (FOG), solids, food debris, and wastewater
  - 5.9.3 Scrub and spray off all internal surfaces from the build-up of FOG or other residual materials
  - 5.9.4 Inspect all internal components, replace anything missing or broken and ensure flow control device is installed if applicable
  - 5.9.5 Refill with fresh water
  - 5.9.6 Replace cover(s)
  - 5.9.7 Enter the required information on the maintenance log
  - 5.9.8 Fill out and submit Appendix D: Pump-out Report to the City.
- 5.10 FOG or solids that have accumulated in the grease interceptor shall not be allowed to pass into any sewer lateral, sewer system, MS4 or public right of way during maintenance activities (i.e. jetting). The FSE/property owner shall be responsible for the proper removal and disposal, by appropriate and legal means, of the captured material and shall maintain records of the dates, amounts and means of disposal, all of which are subject to review by the City at any time.
- 5.11 It is the FSE/property owner's responsibility for performing routine self-inspection of grease interceptors on premises to ensure they are in proper functioning order.
- 5.12 It is the responsibility of the FSE/property owner for opening and closing a grease interceptor or for assisting City staff in performing same for inspection purposes.

- 5.13 Written documentation via a standardized manifest or invoice shall be kept at the FSE premises and/or be readily available for a period of at least two (2) years for inspection by the City.
- 5.13.1 In the event that the City implements an electronic or web-based reporting system, all Pump-Out reports shall be submitted on this system.
- 5.13.2 The FSE shall be responsible for any fees associated with an electronic or web-based reporting system.
- 5.14 When temporarily closing or for future TI space installations, grease interceptors shall be pumped out in accordance with section 5.9 of this manual and refilled with water.
- 5.15 When permanently closing or transferring ownership, the FSE/property owner shall have the grease interceptor cleaned in accordance with section 5.9 of this manual and refilled with water.
- 5.16 When abandoning a grease interceptor in place, the following shall apply:
- 5.16.1 A grease interceptor that has been abandoned or has been discontinued otherwise from further use, or to which no waste or soil pipe from a plumbing fixture is connected, shall have the FOG and solids removed therefrom and be completely filled with earth, sand, gravel, concrete, or other approved material.
- 5.16.2 The top cover(s) over the grease interceptor shall be removed before filling, and the filling shall not extend above the top of the vertical portions of the sidewalls or above the level of the outlet pipe until inspection has been called and the grease interceptor has been inspected. After such inspection, the grease interceptor shall be filled to the level of the top of the ground.
- 5.16.3 The final condition of an abandoned in place grease interceptor shall be approved by the city.

## Section 6: Participating Pumper Program (PPP)

In the event the City implements a Participating Pumper Program, the following shall apply:

- 6.1 Contractors providing services for grease interceptor pump-out within the City service boundaries shall meet specified maintenance criteria established by the City which may, at a minimum, be more stringent but not exclusive of those for a regionally established Pumper Program.
- 6.2 Commercial, institutional and industrial FOG generators in the City should use a Participating Pumper for maintenance and cleaning. Participating Pumpers have signed written agreements with the city that standardize grease interceptor maintenance practices, disposal criteria and reporting requirements.
- 6.3 When FOG generators use a registered Participating Pumper, the pumper assumes responsibility for submitting the required and completed Pump-Out Report to the City and submitting the advance schedule notice, including any fees associated with an electronic or web-based system.
- 6.3.1 FSE/property owners that choose not to use a Participating Pumper, shall be responsible for all maintenance, cleaning, recording, and reporting requirements, including submission of Pump-out Reports and any fees associated with an electronic or web-based system.

- 6.4 Contractors providing services for grease interceptor pump-out within the City service boundaries must be registered with the City and shall meet the standards set forth by the Industrial Pretreatment section when the program is implemented. At a minimum, the following shall apply:
- 6.4.1 Submit a list of facilities pumped out for baseline data collection;
  - 6.4.2 Adhere to the City pump-out schedule, performing service within five (5) business days of the FSEs scheduled service date;
  - 6.4.3 Notify the City of changes to any facility accounts within five (5) calendar days;
  - 6.4.4 Consistently notify the City of the weekly/monthly pump-out schedule and of any unscheduled changes at least the day prior to scheduled service;
  - 6.4.5 Accurately complete the FOG Pump-Out Report form and submit to the City and the FSE/property owner within five (5) business days;
  - 6.4.6 Perform FOG abatement activities that meet City standards in accordance with section 5.9 of this manual.
- 6.5 Failure to consistently meet the performance standards outlined in the Participating Pumper Program shall result in termination of the pumper from the program.
- 6.6 If the City implements an electronic data submission system, all pumpers providing grease interceptor maintenance activities within the City service boundaries shall be required to utilize such system for any required reporting form and/or data submissions.

## Section 7: Plan Review Process

- 7.1 FSE/property owner plan submittal must include but is not limited to:
- 7.1.1 A detailed sewer waste line plumbing plan
  - 7.1.2 Isometric drawing with pipe sizes, floor plans, fixture and drain detail
  - 7.1.3 The grease interceptor sizing worksheet from Appendix A: Grease Interceptor Sizing and Selection
  - 7.1.4 Available seating capacity
  - 7.1.5 Menu
  - 7.1.6 FSE owner's name & contact information.
- 7.2 Plans submitted without all required materials will be deemed incomplete and shall be returned without grease interceptor approval.

## Section 8: Waiver Process

- 8.1 An FSE/property owner may obtain a waiver from the requirement to install a grease interceptor under the following conditions:
- 8.1.1 The FSE/property owner is a Limited Food Preparation Establishment (single service kitchen with no food preparation) (heat/serve only) and uses only disposable service items and has no clean-up operations;

8.2 In the event that the FSE/property owner does not satisfy the conditions set forth in Section 9.1 at any time, the waiver shall be denied/revoked.

8.2.1 In the event that a waiver is denied or revoked an FSE/Property Owner is required to install, operate and maintain an approved and adequately sized grease interceptor capable of maintaining compliance with the objectives of this manual.

## Section 9: Enforcement

9.1 Failure to comply with the provisions of this Manual is considered a violation of Flagstaff City Code, Chapter 7-02 Wastewater Regulations, and enforcement of this Manual shall be in accordance with the City's Enforcement Response Plan, Chapter 7-01.

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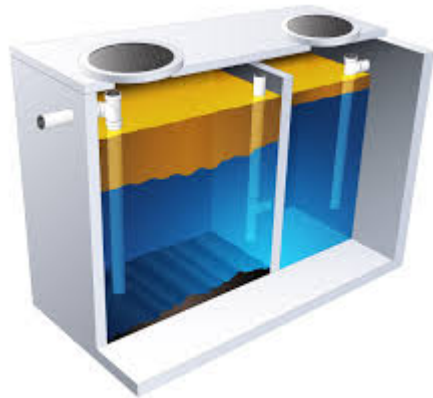
## Appendix A: Grease Interceptor Sizing and Selection

The following shall apply to the sizing and selection of grease interceptors.

### Gravity Grease Interceptors (GGI)

Unless otherwise approved, GGIs shall not be installed. When approved by the City for installation (see Alternate Grease Interceptor Approval Request Form), GGIs shall be made from materials that are compatible with a pH of 3. GGIs made from materials that are subject to corrosion such as concrete or steel, shall be lined or coated with a durable material approved by the City that is compatible with a pH of 3 and that cannot be easily penetrated, scraped away or removed. Acid Resistant Enamel (A.R.E) coatings are not acceptable.

The required capacity of gravity grease interceptors in total liquid volume, shall be determined by multiplying the peak drain flow into the interceptor in gallons per minute by a retention time of 30 minutes.



### Automatic Grease Removal Units (AGRU)

When approved for installation (see Alternate Grease Interceptor Approval Request Form), AGRUs must be designed and tested in accordance with ASME A112.14.4 and/or CSA B481.5. Sizing shall be in accordance with Hydromechanical Grease Interceptor Sizing Step 1: Size by Flow Rate. Step 2: Size by Grease Production shall not apply to AGRUs.



## Hydromechanical Grease Interceptors

HGIs must be designed and tested in accordance with ASME A112.14.3, PDI G101 and/or CSA B481.1. HGIs shall be made from materials that are compatible with a pH of 3. HGIs made from materials that are subject to corrosion such as steel, shall be lined or coated with a durable material approved by the City that is compatible with a pH of 3 and that cannot be easily penetrated, scraped away or removed. Acid Resistant Enamel coatings (A.R.E) are not acceptable. HGI sizing shall be in accordance with Step 1: Size by Flow Rate and Step 2: Calculate Grease Capacity.



### Step 1: Size by Flow Rate

The minimum flow rate for a passive HGI may be calculated by either using pipe diameter or fixture volume using either a one-minute or two-minute drainage period. Use a one-minute drainage period when the interceptor is installed within 20 feet of directly connected fixtures and/or has indirectly connected fixtures. When the interceptor will be installed exterior to the building beyond 20 feet of the connected fixtures use a two-minute drainage period.

#### Fixture Volume Sizing

Use the following formula for sizing fixtures by volume with a 75% fill factor:

$$\left[ \frac{L \times W \times H}{231} \right] \times 0.75 = \text{Fixture Capacity Gallons}$$

Fixture Capacity Gallons x 1 = one-minute drainage period (GPM)

Fixture Capacity Gallons x 0.5 = two-minute drainage period (GPM)

Example: three-compartment sink with each compartment being 18 x 24 x 12 inches

18 x 24 x 12 = 5184 cubic inches (in<sup>3</sup>)

5184 / 231 = 22.44 fixture capacity gallons

22.44 x 3 = 67.3 total fixture capacity gallons (three bowls)

67.3 x 0.75 = 50.4 total fixture capacity after loading factor (75%)

50.4 x 1 = 50 GPM one-minute drainage period

50.4 x 0.5 = 25 GPM two-minute drainage period

To determine the minimum required flow rate for the HGI, calculate the capacity of each fixture that will be connected and add the volumes together and use the appropriate drainage period. An appropriate HGI must be certified to meet the minimum flow rate as calculated. Multiple HGIs may be used separately or combined to meet the flow rate requirement.

It is advisable to use a one-minute drainage period when the HGI will be installed in the kitchen area near the fixtures being serviced. It is essential to use a one-minute drainage period when an indirectly connected fixture is connected to the grease interceptor. A two-minute retention time assumes only directly connected fixtures are routed to the interceptor. A two-minute drainage period will negatively affect the total time for draining fixtures and is often a complaint of owners.



Pipe Diameter Sizing

When the final configuration of kitchen fixtures in an establishment is unknown or to allow for the addition of fixtures in the future, the minimum interceptor volume may be determined by the diameter of the drainage pipe leading from the establishment according to Table 1:

Table 1

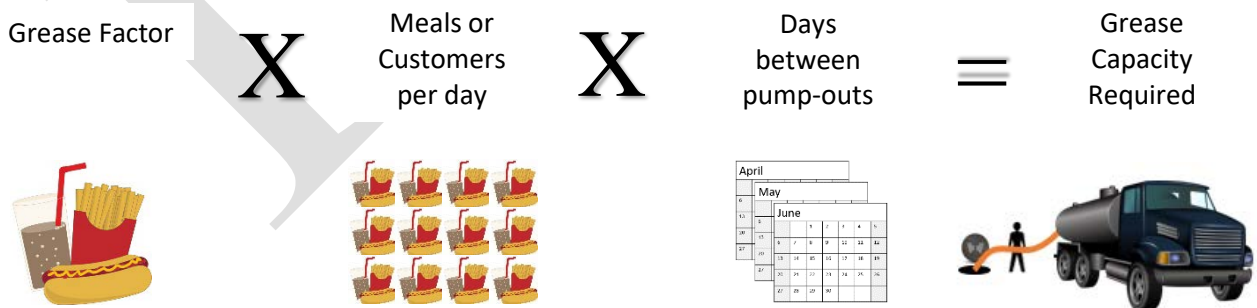
Pipe Size (inches)	Full-Pipe Flow (GPM) <sup>1</sup>	One-minute drainage period (GPM)	Two-minute drainage period (GPM)
2	20	20	10
3	60	75	35
4	125	125	75
5	230	250	125
6	375	400	200
8	426	500	250

1. 1/4 inch per foot based on Manning's formula with friction factor N = 0.012

When using pipe diameter sizing and the interceptor is installed inside the kitchen near the fixtures being serviced, it is advisable to use a one-minute drainage period to ensure the drainage time is not a nuisance. When installed in the kitchen near the fixtures being serviced and there is an indirectly connected fixture it is essential to use a one-minute drainage period. When installed exterior to the building, where the developed length of piping can be quite long, a two-minute drainage period will provide a satisfactory result in drainage times.

**Step 2: Calculate Grease Capacity**

Once the minimum flow rate has been established in Step 1, calculate the minimum grease storage capacity for the HGI required for the desired pump-out frequency as follows:



To determine the correct grease factor, using Table 2, select the menu type (1 through 30), then the correct column (A through D) for whether there is a fryer and whether the establishment uses disposable or washable plates, glasses, knives, forks and spoons (flatware).

Table 2

Type	Menu	Grease Factor ->	without Fryer without flatware	without fryer with flatware	with fryer without flatware	with fryer with flatware
			A	B	C	D
1	Bakery		0.025	0.0325	0.035	0.0455
2	Bar and Grille		0.005	0.0065	0.025	0.0325
3	Barbeque		0.025	0.0325	0.035	0.0455
4	Breakfast Bar - Hotel		0.005	0.0065	0.025	0.0325
5	Buffet		0.035	0.0455	0.058	0.075
6	Burger and fries, fast food		0.025	0.0325	0.035	0.0455
7	Cafeteria		0.025	0.0325	0.035	0.0455
8	Caterer		0.005	0.0065	0.025	0.0325
9	Chinese		0.035	0.0455	0.058	0.075
10	Coffee shop		0.025	0.0325	0.035	0.0455
11	Convenience Store		0.005	0.0065	0.025	0.0325
12	Deep fried Chicken / seafood		0.035	0.0455	0.058	0.075
13	Deli		0.005	0.0065	0.025	0.0325
14	Family Restaurant		0.005	0.0065	0.025	0.0325
15	Frozen Yogurt		0.005	0.0065	0.025	0.0325
16	Greek		0.005	0.0065	0.025	0.0325
17	Grocery Bakery		0.005	0.0065	0.025	0.0325
18	Grocery Deli		0.025	0.0325	0.035	0.0455
19	Grocery Meat Department		0.025	0.0325	0.035	0.0455
20	Ice Cream		0.025	0.0325	0.035	0.0455
21	Indian		0.005	0.0065	0.025	0.0325
22	Italian		0.025	0.0325	0.035	0.0455
23	Mexican, fast food		0.025	0.0325	0.035	0.0455
24	Mexican, full fare		0.035	0.0455	0.058	0.075
25	Pizza		0.025	0.0325	0.035	0.0455
26	Religious Institution		0.005	0.0065	0.025	0.0325
27	Sandwich shop		0.005	0.0065	0.025	0.0325
28	Snack Bar		0.005	0.0065	0.025	0.0325
29	Steak and seafood		0.035	0.0455	0.058	0.075
30	Sushi		0.005	0.0065	0.025	0.0325

**Example:** Fast food burgers and fries, with fryer, with disposable flatware, serving 300 meals per day

Grease factor from Table 3: 6C = 0.035 pounds per meal

Average meals per day = 300

Grease Storage Capacity Calculation	Daily <sup>1</sup>	90 days
Grease Produced (lbs)	10.5	945

<sup>1</sup>multiply average meals per day times grease factor for daily, then times 90 days for total amount produced per quarter

The correctly sized and selected grease interceptor will have the minimum flow rate determined in Step 1 and the grease storage capacity calculated in Step 2. Multiple grease interceptors may be installed to satisfy the minimum flow rate requirement, the minimum grease storage capacity, or both.

Grease interceptors certified to meet a Rated Grease Capacity or the minimum requirements of ASME A112.14.3, CSA B481, and/or PDI G101, shall have the flow rates and minimum grease storage capacities as listed in Table 3:

Table 3

HGI Flow Rate	Minimum Grease Storage Capacity <sup>2</sup> (lbs)
20	40
25	50
35	70
50	100
75	150
100	200
2. Minimum grease capacity as required by ASME A112.14.3, PDI G101 and CSA B481	

Grease interceptors with grease storage capacities exceeding the minimum requirements in Table 3, shall be reviewed and approved by the City when the manufacturer can demonstrate by third-party test reports, including the incremental test data, that the interceptor(s) has the grease storage capacity specified. Upon approval, HGIs with proven higher grease storage capacities may be used to satisfy the sizing and selection requirements of this two-step sizing method.

### Grease Interceptor Sizing and Selection Worksheet, Page 1

Table 4

Qty	Fixture Type	Actual			Fixture <sup>3</sup> Capacity (gallons)	Flow <sup>4</sup> Rate GPM	Total <sup>5</sup> GPM
		L	W	H			
	Multi-Compartment Four Bowls						
	Multi-Compartment Three Bowls						
	Multi-Compartment Two Bowls						
	Prep Sink Two Bowls						
	Prep Sink One Bowl						
	Pre-Rinse Sink One Bowl						
	Dump Sink One Bowl						
	Bar Sink One Bowl						
	Soup Kettle Large				100	100	
	Soup Kettle Medium				50	50	
	Soup Kettle Small				20	20	
	Clothes Washer					2	
	Dipper Well (circulating water)					3	
	Dishwasher - Conveyer type					5	
	Dishwasher - Rack type					2	
	Hand Sink					3	
	Ice Machine (with drain)					1	
	Mop Basin					10	
	Warming Table (with drain)					1	
	Wok Range					12	
	Floor Drain						
	Floor Drain Emergency						
	Floor Sink						
					<b>Grand Total<sup>6</sup>:</b>		

<sup>3</sup> $((L*W*H)/231)*(number\ of\ bowls)*0.75 = Total\ Fixture\ Capacity\ (gallons)$

<sup>4</sup> $Total\ Fixture\ Capacity*1.0 = Flow\ Rate\ (GPM)$

<sup>5</sup> $Flow\ Rate*Qty = Total\ GPM$

<sup>6</sup> $Grand\ Total\ GPM*1.0 = One-minute\ Drainage\ Period$

$Grand\ Total\ GPM*0.50 = Two-minute\ Drainage\ Period$

## Grease Interceptor Sizing and Selection Worksheet, Page 2

1.  Interior Installation       Exterior Installation
2. Are there indirectly connected fixtures routed to the HGI?       Yes     No
3. Will the HGI be installed within 20 feet of the fixtures?       Yes     No

Note: for interior installations, if the answer to either question 2 or 3 is YES, use a one-minute drainage period, otherwise use a two-minute drainage period. For exterior installations use a two-minute drainage period.

**Step 1: Calculate Flow Rate**

1. Total Fixture Volume (Table 4): \_\_\_\_\_ Flow Rate GPM (one or two-minute): \_\_\_\_\_
2. OR, Pipe Diameter (Table 1): \_\_\_\_\_ Flow Rate GPM (one or two-minute): \_\_\_\_\_

**Step 2: Calculate Grease Capacity**

1. Grease Factor (Table 2): \_\_\_\_\_
2. Average meals per day = \_\_\_\_\_

Grease Storage Capacity Calculation	Daily*	90 days
Grease Produced (lbs)		

\*multiply average meals per day times the number of days open per period times the grease factor for grease produced per period

**Note: The correctly sized and selected HGI(s) will have the minimum required flow rate determined in Step 1 and the minimum calculated grease storage capacity determined in Step 2.**

3. Make and model of the HGI selected: \_\_\_\_\_
4. Is the material of construction compatible with a pH of 3?     Yes     No
5. If the answer to number 4 is "no", what material is the tank lined or coated with\*:  
\_\_\_\_\_

\*must provide evidence that the liner or coating is compatible with a pH of 3 and that it cannot be easily penetrated, scraped off or removed. Acid Resistant Enamel Coatings (A.R.E) are not allowed.

6. Flow rate (GPM): \_\_\_\_\_ Proven grease capacity (lbs): \_\_\_\_\_

Please submit the completed Grease Interceptor Sizing and Selection Worksheet to the Utility for approval along with any other required documents.

Applicant Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Company: \_\_\_\_\_ Email: \_\_\_\_\_

Name of Establishment: \_\_\_\_\_

Signature of Applicant: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix B: Alternate Grease Interceptor Approval Request

### Gravity Grease Interceptor (GGI)

1. Peak flow rate for connected fixtures (Worksheet, Page 1): \_\_\_\_\_
2. Size of GGI\* (gallons): \_\_\_\_\_  
 \*multiply peak flow rate of connected fixtures times 30 minutes
3. What material is the GGI made from? \_\_\_\_\_
4. Is the material compatible with a pH of 3?  Yes  No
5. If the answer to number 4 is "no", what material is the tank lined or coated with\*:

\_\_\_\_\_

\*must provide evidence that the liner or coating is compatible with a pH of 3 and that it cannot be easily penetrated, scraped off or removed. Acid Resistant Coatings (A.R.E) are not allowed.

Reason for request: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Automatic Grease Removal Unit (AGRU)

1. Describe the fixtures to be connected: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
2. Total Fixture Volume (Table 5): \_\_\_\_\_ Flow Rate GPM (one minute): \_\_\_\_\_
3. Make and Model of the AGRU proposed: \_\_\_\_\_

Reason for request: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Please submit the completed Grease Interceptor Sizing and Selection Worksheet to the Utility for approval along with any other required documents.

Applicant Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Company: \_\_\_\_\_ Email: \_\_\_\_\_

Name of Establishment: \_\_\_\_\_

Signature of Applicant: \_\_\_\_\_ Date: \_\_\_\_\_



## Appendix C: Alternate Maintenance Approval Request

Self-cleaning by the owner and/or operator of an establishment is not allowed unless approved by the City. Only hydromechanical grease interceptors (HGI) with a liquid volume of less than 100 gallons may be considered for self-cleaning. When approved, the owner and/or operator of an establishment shall comply with the following requirements for maintenance on a weekly basis, at minimum, or more often as necessary as required by the City:

- Remove cover(s)
- Remove all fats, oils, and grease (FOG), solids, food debris, and wastewater
- Scrub and spray off all internal surfaces from the build-up of FOG or other residual materials
- Place all removed materials in garbage bag or other sealable container (not glass) along with an absorbent material (i.e. kitty litter) and dispose of in trash receptacle
- Inspect all internal components, replace anything missing or broken and ensure flow control device is installed
- Refill with fresh water
- Replace cover(s)
- Enter the required information on the maintenance log

At least once per quarter, the grease interceptor(s) shall be cleaned by a scavenger waste hauler, documented by a manifest, reported in the maintenance log, and all records maintained for the previous three (3) years.

Make and model of HGI: \_\_\_\_\_

Flow Rate: \_\_\_\_\_ Grease Storage Capacity: \_\_\_\_\_

Grease Factor (Table 2): \_\_\_\_\_ Average Meals per day: \_\_\_\_\_

Grease Produced per day\*: \_\_\_\_\_ Cleaning frequency\*\*: \_\_\_\_\_ days

\*multiply Grease Factor times Average Meals per day

\*\*Divide HGI grease storage capacity by Grease Produced per day

**Reason for request:** \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_

Please submit the completed Grease Interceptor Sizing and Selection Worksheet to the Utility for approval along with any other required documents.

Applicant Name: \_\_\_\_\_ Phone: \_\_\_\_\_

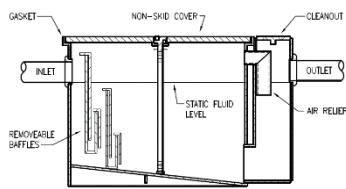
Company: \_\_\_\_\_ Email: \_\_\_\_\_

Name of Establishment: \_\_\_\_\_

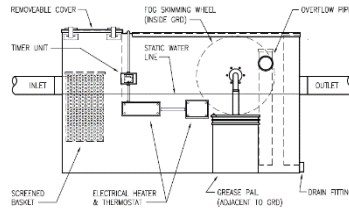
Signature of Applicant: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix D: Pump-out Report

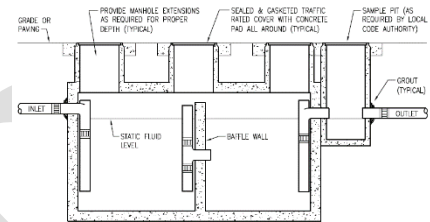
<b>Business Name</b>	<b>Store #</b>	<b>Phone</b>	
<b>Address</b>	<b>City</b>	<b>State</b>	<b>Zip</b>



**Hydromechanical (HGI)**



**Automatic (AGRU)**



**Gravity (GGI)**

	GRD #1	GRD #2	GRD #3
	<input type="checkbox"/> HGI <input type="checkbox"/> AGRD <input type="checkbox"/> GGI	<input type="checkbox"/> HGI <input type="checkbox"/> AGRD <input type="checkbox"/> GGI	<input type="checkbox"/> HGI <input type="checkbox"/> AGRD <input type="checkbox"/> GGI
Location			
FOG Layer (inches)			
Solids Layer (inches)			
Total Gallons			
FOG Leaving Inpection Port/Tee	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
GRD Condition (check only if it applies)	<input type="checkbox"/> Needs Repair	<input type="checkbox"/> Needs Repair	<input type="checkbox"/> Needs Repair

Explanation/Notes

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Certification: I hereby certify that all information provided herein is true and correct to the best of my knowledge. The Grease Removal Device(s) serving this establishment was inspected and completely cleaned of residual fats, oils, and grease, food debris and other materials present.

Name (printed): \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_

**Submit completed report to the City within 10 days of Pump-out**

## Appendix E: Participating Pumper Program Registration

In the event that the City establishes a Participating Pumper Program (PPP), permitted scavenger waste haulers that wish to participate must complete and submit this registration. The PPP manages the companies that properly pump, haul and dispose of grease interceptor waste for commercial and institutional food service establishments. To participate in the program, all pumpers must fill out and turn in this application to the City of Flagstaff, Water Services, 2323 N. Walgreen Street, Flagstaff, AZ 86004, Attn: Industrial Pretreatment.

### Participating Pumper Program Requirements:

1. Submit a list of facilities pumped out for baseline data collection;
2. Adhere to the City pump-out schedule, performing service within five (5) business days of the FSEs scheduled service date;
3. Notify the City of changes to any facility accounts within five (5) calendar days;
4. Consistently notify the City of the weekly/monthly pump-out schedule and of any unscheduled changes at least the day prior to scheduled service;
5. Perform FOG abatement activities that meet City standards;
6. Accurately complete Appendix D: FOG Pump-Out Report form for each pump-out performed and submit to the City and the FSE/property owner within five (5) business days;
7. If the City implements an electronic data submission system, all contractors providing grease interceptor maintenance activities within the City service boundaries shall be required to utilize such system for any required reporting form and/or data submissions and to adhere to minimum standards set by the City;
8. Pumpers will satisfactorily dispose of pumpout waste in accordance with all applicable local, state, and federal regulations. Decanting or stacking, which involves returning wastewater from a grease hauler truck back into the grease interceptor or directly to the sewer after it has been pumped out, is never permitted;
9. It shall be the responsibility of the Pumping Company to update the City with any new contact information, signatory, authorized representative or waste disposal site within 10 days;
10. Failure to consistently meet the requirements of this permit and the performance standards outlined in Section 6 of this manual shall result in pumper permit termination.

### Company Information

Company Name		Primary Contact	
Mailing Address		City	State Zip
Phone No.	Fax No.	Email	

**Authorized Representative Statement**

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Name (printed): \_\_\_\_\_ Date: \_\_\_\_\_

Signed: \_\_\_\_\_

City Approval: \_\_\_\_\_ Date: \_\_\_\_\_

Draft