



**General:**

The purpose of this document is to provide the reader with general information about how grease interceptors work and how they benefit both the customer and the sewer utility. In addition it will provide specific information regarding statutory requirements for the installation and maintenance of grease interceptors as provided by the West Virginia Bureau of Public Health and the *Sewer Use Ordinance* of the City of Beckley.

As a user of the Beckley Sanitary Board (BSB) Public Owned Treatment Works (POTW), your use of the POTW is governed by the Beckley Sanitary Board *Sewer Use Ordinance* and all Beckley Sanitary Board Policies derived thereof. As a Food Service Establishment, it has been determined that your operations have the potential to contribute fat, oil, and grease to your wastewater discharge. BSB *Sewer Use Ordinance* and Policies stipulate your business must furnish and maintain an appropriately sized and properly maintained grease interceptor device and institute operational Best Management Practices (BPMs) prior to discharging any waste stream into the system.

The Grease Interceptor Program established by the Beckley Sanitary Board (the "Board") deals primarily with grease producing facilities (Food Service Establishments) including but not limited to schools, correctional facilities, other commercial and institutional kitchens, and cafeterias. Although there are other sources of grease, this document concerns itself with Fats, Oils and Grease (FOG) resulting from food preparation.

Excessive amounts of grease cause various problems in the wastewater collection system (sewer and pumping systems), as well as in the wastewater treatment plant. Grease accumulates in sewer lines, manholes and other similar structures, which restricts the flow of wastewater and results in sewer blockages. In the wastewater pump stations (called "lift stations"), grease causes buildup in the wetwell, reducing its holding capacity, and can cause float switches to malfunction. Finally, at the wastewater treatment plant, grease buildup occurs in channels and tanks, fouls pumps and metering devices, and can ultimately end up in the receiving stream, thereby violating Federal and State water quality standards. Grease buildup in your building's plumbing and sewer lines can also cause sewer backups and other related problems.

What is a grease interceptor? A grease interceptor looks very much like a septic tank. Three-compartment sinks, pot sinks and similar fixtures, used in food preparation and cleanup, discharge their wastewater through separate plumbing into a grease interceptor rather than directly into the public sewer lines. Upon entering the interceptor, the wastewater flow slows, which allows the lighter grease to separate from the wastewater and float to the top of the interceptor where it cools. The grease will tend to collect and float in the interceptor. Over a period of time, the grease will build up to a point where it needs to be removed. If not removed, a blockage will occur.

To prevent grease problems in public sewer lines and wastewater treatment facilities, the West Virginia Bureau of Public Health, the West Virginia Department of Environmental Protection, and the City of Beckley have promulgated regulations governing grease abatement, principally through installation and maintenance of grease interceptors and enforcement of the various regulations.

This document is intended to summarize the requirements for grease interceptors. More information can be found in the West Virginia Interpretive Rules, Board of Health, Chapter 16-1, Series VII, Part X, (1983), additional West Virginia Bureau of Public Health standards which were promulgated in 1988, and Chapter 9 of the *Code of the City of Beckley*. The Beckley Sanitary Board will make the final determination as to whether your grease interceptor and maintenance program is acceptable since the Board is responsible for treatment of the waste.

### **Regulations:**

Grease interceptors shall be located within 30 feet of the fixtures served, and only those plumbing fixtures into which the grease and fats are to be discharged are to be connected to the grease interceptor. The grease interceptor shall be in an easily accessible place outside the building served. Indoor grease traps are discouraged because the indoor traps are more likely to produce unpleasant odors and will require a more frequent cleaning routine (cleaning requirements are discussed later). For the use of an indoor grease trap to be used, the General Manager must approve the use of the trap and the food service establishment must enter into the Special Grease Trap Agreement with the Beckley Sanitary Board.

The interceptor should be designed so the influent tee (or inlet structure) is at least twice the distance of the liquid depth from the effluent tee (or outlet structure). The interceptor must have at least two (2) feet of liquid depth. The influent tee must be submerged at least 25% but no more than 35% of the liquid depth. The effluent tee must be submerged at least 75% but no more than 85% of the liquid depth. Metal tanks are not permitted for outdoor use as a grease interceptor unless written permission is obtained from the BSB General Manager. If the grease interceptor is too large to allow for a one-piece removable lid, then the interceptor shall have two (2), 20-inch diameter (or larger) easily removable covers. One lid shall be located over the influent side of the interceptor and one over the effluent side of the interceptor to allow for grease measurement, servicing, and cleaning.

A summary of the City of Beckley's *Sewer Use Ordinance*, General and Specific Prohibitive Standards (Article I, Section 9-5(b)) states that "any discharge of fats, oils, or grease of animal or vegetable origin is limited to 100 mg/L." Paraphrasing the same section, solid or viscous waste which may cause obstruction to the flow in a sewer or with operation of the wastewater treatment facilities, such as, but not limited to: grease,

garbage, particles greater than ½-inch, animal guts or tissue, whole blood, and other similar substances shall not be disposed of into the sanitary sewer system.

Section 9-4 (g) (3) (b), provides that you can be charged for the cost of disposal of oil and grease which is in excess of the permitted limit (100 mg/L).

Section 9-7, of the *Sewer Use Ordinance*, provides for civil and criminal penalties for those who willfully or negligently violate the provisions of the *Ordinance*. Civil penalties range from \$100 to \$1000 per offense with each day on which a violation occurs or continues being deemed a separate and distinct offense.

### **Sizing, Installation and Design Drawings:**

As previously stated, kitchen facilities must have a sewer line for the grease interceptor and a separate sewer service line for food wastes. The discharge of a dishwasher must go to the food waste sewer line and may not be plumbed to the grease interceptor.

Commercial interceptors will usually be sized to 1000 or 2000 gallons capacity. To determine the size of a grease interceptor required, follow the Uniform Plumbing Code sizing requirements and follow the example listed below.

#### **Example Problem:**

A restaurant with a seating capacity of 100 persons serves meals from 9:00 a.m. to 9:00 p.m. The restaurant does not have the automatic dishwasher plumbed into the interceptor but does have the pre-rinse sink plumbed into the interceptor. The restaurant uses reusable plates. Calculate the grease interceptor volume required.

$$(100 \text{ seats} \times 1.00) \times 5 \times 2.5 \times 1.5 = 1875 \text{ gallons}$$

It would be preferable to design for a safety factor and use a standard-sized, pre-cast (or pre-constructed) unit of 2000 gallons capacity.

Grease interceptors are permitted in double-compartment access hatches. The access way must be a minimum 20-inch diameter, and in the case of two access points, one must be over the inlet and one must be over the outlet, as illustrated in Figure 2.

#### **Figure 1: 1000-Gallon Grease Interceptor (top and side views)**

*(Available upon request...submit proposed interceptor for review and approval)*

Optimum dimensioning of the tank calls for the length to be twice the measurement of the depth of the tank. Note that the access hatch (see the Longitudinal Section) is 24", which is greater than the minimum requirement of 20". The outlet tee must reach to within 12" of the tank floor (see the Cross Section).

**Figure 2: 2000-Gallon Grease Interceptor (top and side views)**

*(Available upon request...submit proposed interceptor for review and approval)*

The overall performance of the grease interceptor is affected by additional factors besides design. Construction practices, such as, water tightness of the unit, the use of additional baffling in the tank, and frequency of cleaning (see next section) are factors that greatly affect grease removal efficiency.

The grease interceptor must be watertight and located such that surface water is prevented from draining or leaking into the unit. Any additional amount of water applied to the unit will necessarily reduce its efficiency and is to be avoided. Open or leaking access covers not only allow water into the unit, but also allow odors to escape.

The use of additional baffling located approximately 1/2 of the distance from the inlet tee in the direction of the outlet tee will slow the horizontal flow in the tank. This can prevent "short-circuiting" in the tank, whereby greasy water enters the interceptor, then flows in the direction of the outlet tee without residing in the tank long enough to separate and be captured. A baffle located mid-tank lengthwise and extending from the top of the interceptor to the bottom having a pass-through port 2/3<sup>rd</sup> to 3/4<sup>th</sup> of the water level will slow the horizontal flow in the tank and provide an additional grease concentration zone rather than having grease build up around outlet pipe. As grease builds up it tends to force the entire volume of grease downward and will, if not removed, plug up the outlet pipe. A baffle will concentrate grease buildup ahead of the tee and, if it does get under the baffle due to buildup, then the final outlet tee will still be able to contain grease without plugging up as quickly as without a baffle.

Other Design Considerations:

Toilets, drains and other plumbing fixtures, or drains not related to grease removal, shall not be connected to the grease interceptor. Garbage grinders and other food processing units shall not be connected to the grease interceptor.

Three-bowl sinks, hand sinks related to the three-bowl sink, and mop sinks (those related to kitchen cleanup) are allowed to be connected to the grease interceptor.

Only with prior approval of the Board and **signing the Special Grease Trap Agreement**, may under-the-counter or floor-mounted (indoor) grease interceptors be permitted; otherwise, they are not allowable. Requests for approval will be reviewed on an individual basis by the Board when physical limitations will not allow a grease interceptor installation within 30 feet of the fixture(s) served **or other special instances**.

Cleanouts should be provided in order that the sewer line from the grease source to the grease interceptor can be maintained in case of blockage.

## Cleaning and Other Operational Considerations:

Cleaning and other operational considerations are the most important factors in grease interceptor operation from the owner's standpoint. Since the ultimate responsibility rests with the owner/operator of the system, monitoring and cleaning are the primary actions which can be taken to obtain maximum grease interceptor efficiency.

### Keeping Your Interceptor Clean:

Many owners of grease-generating enterprises contract the services of a firm licensed to haul such wastes. These firms are familiar with the proper procedures, scheduling and disposal of grease interceptor wastes.

Grease interceptors should be pumped prior to reaching **25%** of the tank's grease-holding capacity. Depending on the nature and amount of grease generated, the cleaning frequency can range from once per week (for under-sized units) to as much as once per quarter. Actual experience will dictate the required pumping schedule. A Sanitary Board representative will make regular visits to inspect your grease interceptor. The inspector will inspect your grease interceptor records (hauling receipts, and/or records showing other methods of grease removal) and will visually inspect the grease interceptor for its effectiveness in removing grease. Should deficiencies be discovered in records keeping and/or the actual grease interceptor performance, the establishment will be notified of the deficiency and will schedule a return visit to confirm the deficiency has been remedied.

Again, remember that the *Sewer Use Ordinance* has specific limits on grease (100mg/L maximum). If the Board's representative determines that the grease interceptor is performing so poorly as to be causing problems in the Board's sanitary sewer system (restricting flow in the pipe, building up in the manhole, etc.), then you will be referred to the appropriate legal authority for further action, which may include fines and/or a sewer ban as well as installing the properly sized interceptor.

The use of hot water, solvents, emulsifiers, acids, and other such methods to open plugged sewer lines leading to or from the grease interceptor is not allowable. The introduction of hot water into the sewer system that would cause the wastewater to enter the wastewater treatment plant at greater than **104°F** is specifically prohibited by the City of Beckley's *Sewer Use Ordinance*.

The use of grease-eating bacteria and/or enzymes **is not permissible**. The Board will still inspect and potentially sample those firms using bacterial and/or enzymatic grease treatments.

Regardless of the method used to clean grease interceptors, a certain amount of pumping will be required to remove sediment in the tank itself. Typically, enzymes will tend to increase solids buildup in the bottom of the tank, and if not pumped promptly, it will eventually plug the grease interceptor outlet. Still, owners are free to make business decisions as to what is the most economical cleaning method for their particular situation.

### Monitoring:

Check your grease interceptor routinely. If your typical cleaning schedule is every month, check it weekly; if your cleaning schedule is weekly, check it every other day. Two basic ways to check your interceptor are: visually; and by measurement. Visual inspections are a good way to gauge the amount of grease in the interceptor; however, it may be deceiving in certain instances. For example, it can be baked hard on top ("surface crust"), but directly underneath it is only watery. On the contrary, the surface may look clean, but sediment in the bottom is too deep for proper operation of the interceptor. To be certain, you need to use a rod to gauge grease thickness and to probe sediment depth.

Do NOT wait for the Board's representative to force you to contact a grease removal service! Check your interceptor routinely! Schedule a routine cleaning or have a firm maintain your interceptor on a regular basis.

### Best Management Practices:

1. Segregate and collect waste cooking oils;
2. Scrape food scraps into garbage prior to washing;
3. Wipe grease, fats and oils from pots, pans and other cookware prior to washing in 3-compartment sink;
4. Pre-rinse all plates, bowls, dishes, etc. prior to loading into dishwasher;
5. Install/use removable drain screens in all sink drains to capture solid materials;
6. Kitchen Signage. BMP's and waste minimization practice shall be posted conspicuously in the food preparation and dishwashing areas at all times;
7. Employee Training: Employees involved in cooking and cleaning activities shall be trained on the following subjects:
  - How to dry wipe pots, pans, cookware and work areas before washing to remove grease,
  - How to properly dispose of food waste and solids in enclosed plastic bags prior to disposal in trash bins or dumpsters to prevent leaking and odors,
  - The location and use of absorption products to clean under fryer baskets and other locations where grease may be spilled or dripped,
  - Proper methods for disposal of grease and oil from cooking equipment into a grease recycling receptacle without spilling.

8. Spent cooking oil must be stored outside, in a covered container, for proper disposal (typically by a waste hauler); **Never** put cooking oil in the line to the grease interceptor; it will not be properly captured in the grease interceptor and may lead to a violation of the *Sewer Use Ordinance*.

**Conclusion:**

Please remember that you and the Beckley Sanitary Board are partners in solving problems associated with grease. Doing your part will make the job easier for both of us. If you have questions about our grease interceptor program, contact the Sanitary Board at 256-1760, Monday through Friday, except holidays, from 8:00 a.m. until 4:00 p.m. We will be glad to provide you with helpful information in establishing a Grease Interceptor Program.

**Revision Date: July 29, 2014**