

# FOG Abatement Program – Establishing the Business Case Worksheet

## Utility FOG-line Cleaning Costs

What **data** is currently collected?

- FOG analysis by an environmental laboratory
- Photographs of grease interceptors or FOG build-up
- Videos of clean or dirty sewer lines
- FSE inspections
- Pump-out dates and quantities
- Other \_\_\_\_\_

How many **linear feet of collection system are being cleaned** in excess of normal cleaning cycle (normal cleaning is typically 3-5 years)

Number of linear feet cleaned	Cleaning frequency (months)

What is the routine cleaning frequency for all other sanitary sewer lines?

- Every three years?
- Every four years?
- Other: \_\_\_\_\_

What is the **cost to clean sanitary sewer lines** per linear foot?

Column A	Column B	Column C	Column D	
<b>Time to clean each line section (hrs)</b>	Fully loaded labor rate (\$/hr)	Equipment cost (\$/hr)	Traffic Control (\$/hr)	Total cost (A*(B+C+D))

Fully loaded labor rate includes benefits and overhead. For emergency cleanouts, include overtime charges. Equipment costs may be estimated based upon the cost for renting equipment. Traffic control costs may be estimated based on the cost for contracting out for traffic control.

What is the **cost to perform non-routine inspections of manholes** due to FOG build-up? Sometimes manholes need to be inspected more often to make sure that excessive FOG is not accumulating.

Column A	Column B	Column C	Column D	Column E	Column F	
<b>Manhole O&amp;M</b>	<b>Number of Manholes</b>	<b>Average Labor (hrs/manhole)</b>	<b>Time Spent (hrs/yr) (B*C)</b>	<b>Fully Loaded Labor Rate (\$/hr)</b>	<b>Equipment Cost (\$/hr)</b>	<b>Total Annual Cost (\$/yr) (D*(E+F))</b>
Manhole inspections						
FOG Removal						
<b>Total Annual Cost (\$/yr.)</b>						

What is the **cost to replace FOG-impacted manholes**?

Sometimes manholes will be severely impacted by FOG and need to be replaced. Use this table to estimate the manhole replacement costs each year.

Column A	Column B	Column C	Column D	Column E	Column F	Column G	
<b>Manhole Replacement</b>	<b>Number of Manholes (mh)</b>	<b>Average Replacement Cost (\$/mh)</b>	<b>Time Spent (hrs/mh)</b>	<b>Fully Loaded Labor Rate (\$/hr)</b>	<b>Equipment Cost (\$/hr)</b>	<b>Bypass Pumping (\$/hr)</b>	<b>Total Annual Cost (\$/yr) ((B*C)+(D*(E+F+G)))</b>
Manhole replacement							
<b>Total Annual Cost (\$/yr.)</b>							

What is the **cost to clean pump stations**?

Column A	Column B	Column C	Column D	
<b>Time to clean each pump station (hrs)</b>	Fully loaded labor rate (\$/hr)	Equipment cost (\$/hr)	Traffic Control (\$/hr)	Total cost (A*(B+C+D))

Are you **cleaning air relief valves**?

- What is the estimated cost of this?
- If not cleaning air relief valves, are you monitoring electricity usage at the pump station?

What does it cost to **dispose of FOG** removed from lines, manholes, pump stations and/or air relief valves?

Column A	Column B	Column C	Column D	Column E	
<b>Number of Loads</b>	Fully loaded labor rate (\$/hr)	R.T. Time to haul waste FOG (hrs)	Transportation costs (\$/load)	Disposal Costs (\$/load)	Total disposal cost (A*(D+E)+B*C)

Transportation costs may be estimated based on the cost for renting equipment to move the waste FOG. Disposal costs are landfill tipping fees, the cost to mix FOG in with municipal biosolids, or to dry it, etc.

What is the **excess wastewater treatment (WWT) plant cost of FOG**?

The excess cost of FOG at a WWT plant can be estimated based on the **cost of treatment** plus the **cost of maintenance**.

The **WWT plant treatment cost of FOG** can be estimated by estimating the pounds (lbs) of FOG to be treated. The WERF (Water Environment Research Foundation) estimates one lb of FOG is approximately equal to 0.5 lbs of COD. BOD is typically a fifth lower than COD. For cost estimation, use the cost to treat 0.4 lbs of BOD for every one lb of FOG estimated to be treated.

Do you have an estimate of the amount of FOG entering your WWT plant based on an estimated amount of FOG discharged from FSEs?

Do you have a surcharge for COD or BOD for non-residential users?

If Yes to both questions, use the “Method 1” table below to estimate the cost of treatment.

If you know the FOG concentration in the WWT plant influent, use the “Method 2” table below to estimate the cost of treatment.

Method 1					
Column A	Column B	Column C			
WWTP Treatment	Grease Removal Device Bypass* (lbs/year)	Cost per Pound of FOG ( \$/lb)**	Total Annual Cost (\$/yr.) (B*C)		
FOG Discharge from FSEs					
* Bypass is the FOG not captured by the GRD ( estimated ~15% for GGIs, ~5% for HGIs) Use grease production value for each FSE (ASPE Design Handbook, Volume 4, Chapter 8, Table 8.3)					
** 1 lb. FOG = 0.5 lb.COD, Use COD surcharge rate (\$/lb.)					
Method 2					
Column A	Column B	Column C	Column D	Column E	
WWTP Treatment	Influent FOG Concentration (mg/L)	WWTP Flow (MGD)	Influent FOG (lbs./day)	Cost/lb. of FOG (\$/lb./day)*	Total Cost (\$/yr.)** (E*365)
Influent FOG to WWTP					
* 1 lb. FOG = 0.5 lb.COD, Use COD surcharge rate (\$/lb.)					
** Calculate cost per yr. 365 days/yr. for annual cost					

If you have a surcharge for COD, “Method 1” and “Method 2” in the tables above use 0.5 lbs of COD per lb of FOG.

If you have a surcharge for BOD:

$$\text{Pounds of FOG entering the WWT plant/yr} * 0.4 * (\text{BOD surcharge/lb}) = \text{annual WWT plant operations costs.}$$

The **WWTP plant FOG-related maintenance costs** can be calculated if you know how much staff time and resources are spent on dealing with the FOG issues.

Does your WWTP plant staff track their time spent on FOG issues?

Estimate their fully-burdened rate of maintaining equipment affected by FOG.

Estimate the cost of disposal of FOG physically removed from the WWTP plant and hauled off (i.e., scum, froth).

You can use the table below to estimate the **annual WWTP plant FOG-related maintenance costs**.

Column A	Column B	Column C	Column D	Column E	
WWTP O&M	Time Spent (hrs/yr.)	Fully Loaded Labor Rate (\$/hr)	Equipment Cost (\$/hr)	Disposal Cost (\$/lb. removed)	Total Annual Cost (\$/yr.) B*(C+D)+E
Cleaning preliminary treatment unit					
Cleaning clarifier weirs					
Sludge disposal					
Other					
Other					
Other					
<b>Total Annual Cost (\$/yr.)</b>					

This is a summary of the existing annual costs for “status quo,” also known as “do nothing” costs.

Item	Fully Burdened Cost/year
<b>Linear feet/yr that must be cleaned.</b>	
<b>Manholes that must be inspected, cleaned, and replaced</b>	
<b>Pump stations that must be inspected and cleaned.</b>	
<b>Air relief valves that must be inspected and cleaned.</b>	
<b>Wastewater treatment plant treatment</b>	
<b>Wastewater treatment plant maintenance</b>	
<b>FOG disposal (lines, manholes, pump stations, WWT plant)</b>	
<b>Total Annual</b>	

## EVALUATING FOG PROGRAM COSTS

How many FSEs are in the jurisdiction? Use previous “Inventory of FSEs in the Jurisdiction” table.

### Staff costs

- Estimate number of FSE inspections that can be completed per day (include travel time and data entry):
- Estimate Full Time Employees (FTEs) to initiate the program (number of FSE / inspections per day /260 days per year):
- Estimate FTEs to continue the program (number of inspections per day will be higher for ongoing inspections than for initial inspections but data entry and analysis may be significant):

## SUMMARY OF FOG PROGRAM CONSIDERATIONS

### Program Costs

- Inspections
- Data management
- Oversight

### Stakeholder interactions (these take time and thought)

- Public outreach
- FSE regulation/communication
- Communicate the FOG program as a cost-effective service to achieve protection of the public health and environment

### Implementation

- Understand grease removal devices (GRDs), their effective uses, how they’re sized, and how maintained; have clear expectations and communicate with FSEs
- Try to have consistent plumbing/building codes for GRDs
- Provide clear guidance and technical assistance
- Provide equity between retrofits and new construction
- Have clear objectives for initial and subsequent inspections
- Use data management tools to target inspections

### Communicate with Food Service Establishments (FSEs).

- Municipality FOG requirements
- They need to have a grease removal device (GRD)
- They must maintain the GRD with regular pump outs
- They must keep records of the pump outs
- There is potential for enforcement action

## COST-BENEFIT ANALYSIS

Summarize Current Costs of Excess Cleaning Identified in Tables above

Item	Total Cost (\$/yr)
Cost to clean sanitary sewer lines per linear foot	
Cost to dispose of FOG removed from lines	
Cost to clean pump stations and air relief valves	
Cost to dispose of FOG removed from pump stations	
Cost to inspect, clean, and replace manholes	
Cost to dispose of FOG removed from manholes	
WWT plant treatment and maintenance costs	
WWT plant FOG disposal costs	

Summarize Estimated Costs to Develop and Implement FOG Program

Item	FTE Required	Total cost (FTE * rate)
Initiate Program/initial inspections		
Legal authority implementation		
Stakeholder engagement		
Create process map and communicate it		

Summarize Estimated Costs to Maintain a Well-Managed FOG Program

Item	FTE Required	Total cost (FTE * rate)
Ongoing inspections		
Data analysis (software license or in-house effort)		
Stakeholder engagement and education		

DOES THE COST FOR FOG PROGRAM OUTWEIGH EXISTING COSTS (STATUS QUO)?

EXISTING PROGRAM COSTS \_\_\_\_\_

FOG PROGRAM IMPLEMENTED COSTS \_\_\_\_\_