

HOW TO CONDUCT A COST-BENEFIT ANALYSIS OF YOUR FOG PROGRAM

**Western States Alliance
2023 FOG Forum
Hood River, OR**

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PPRC/WSA
Seattle, WA

POLLUTION PREVENTION
resource center





BEFORE WE BEGIN...

THANK YOU

POLLUTION PREVENTION
RESOURCE CENTER (PPRC)

WESTERN STATES
ALLIANCE



Prevent Pollution

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About Us

Western States Alliance (WSA) is a project of the [Pollution Prevention Resource Center](#) that helps professionals identify and implement best practices in Fats, Oils, and Greases (FOG) management.

We are a membership organization of FOG professionals from across the United States. [Click here](#) to check out our staff bios on pprc.org.

Our vision is to be a comprehensive source of knowledge and assistance to advance technologies and best management practices, conserve resources, and derive the most value from FOG while prohibiting its damaging effects in the wastewater system.

Conferences & Workshops

We offer two FOG related technical training conferences each year: The [FOG Forum](#) & the [Pacific Northwest Pretreatment Workshop](#). Both events offer immersive training, program development and implementation sessions, and many opportunities for networking with your peers.

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FOG Abatement Training

With funding from the USDA, we provide both virtual and in-person trainings to help small rural communities and those who serve them. The trainings focus on building the business case for your program, program implementation and emerging chemicals of concern.

[Training Calendar >](#)

National Resource Reference Guide

Our National Reference Resource Guide is a "one-stop" shop to learn about FOG, its value as a resource, its problems in sewer conveyance lines, its contribution to sanitary sewer overflows, its cost of treatment, and how you can establish or enhance a FOG Abatement program.

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TECHNICAL RESOURCES TAB

National Resource Reference Guide

Our National Reference Resource Guide is a "one-stop" shop to learn about FOG, its value as a resource, its problems in sewer conveyance lines, its contribution to sanitary sewer overflows, its cost of treatment, and how you can establish or enhance a FOG Abatement program.

[View the Guide >](#)

WHAT IS A FOG PROGRAM COST-BENEFIT ANALYSIS?

HELPS MAKE THE “BUSINESS CASE” FOR THE FOG PROGRAM

- THE PROCESS OF COMPARING THE COSTS AND BENEFITS OF ACTIVITIES & RESOURCE ALLOCATIONS TO ACHIEVE DESIRED RESULTS
- A WAY TO EVALUATE EFFECTIVENESS OF DECISION-MAKING
- HELPS COLLECTION SYSTEM STAFF & FOG PROGRAM MANAGERS MAKE INFORMED DECISIONS
- A WAY TO DETERMINE THE BEAK-EVEN TIME PERIOD WHERE THE FOG PROGRAM COSTS EQUAL THE BENEFITS

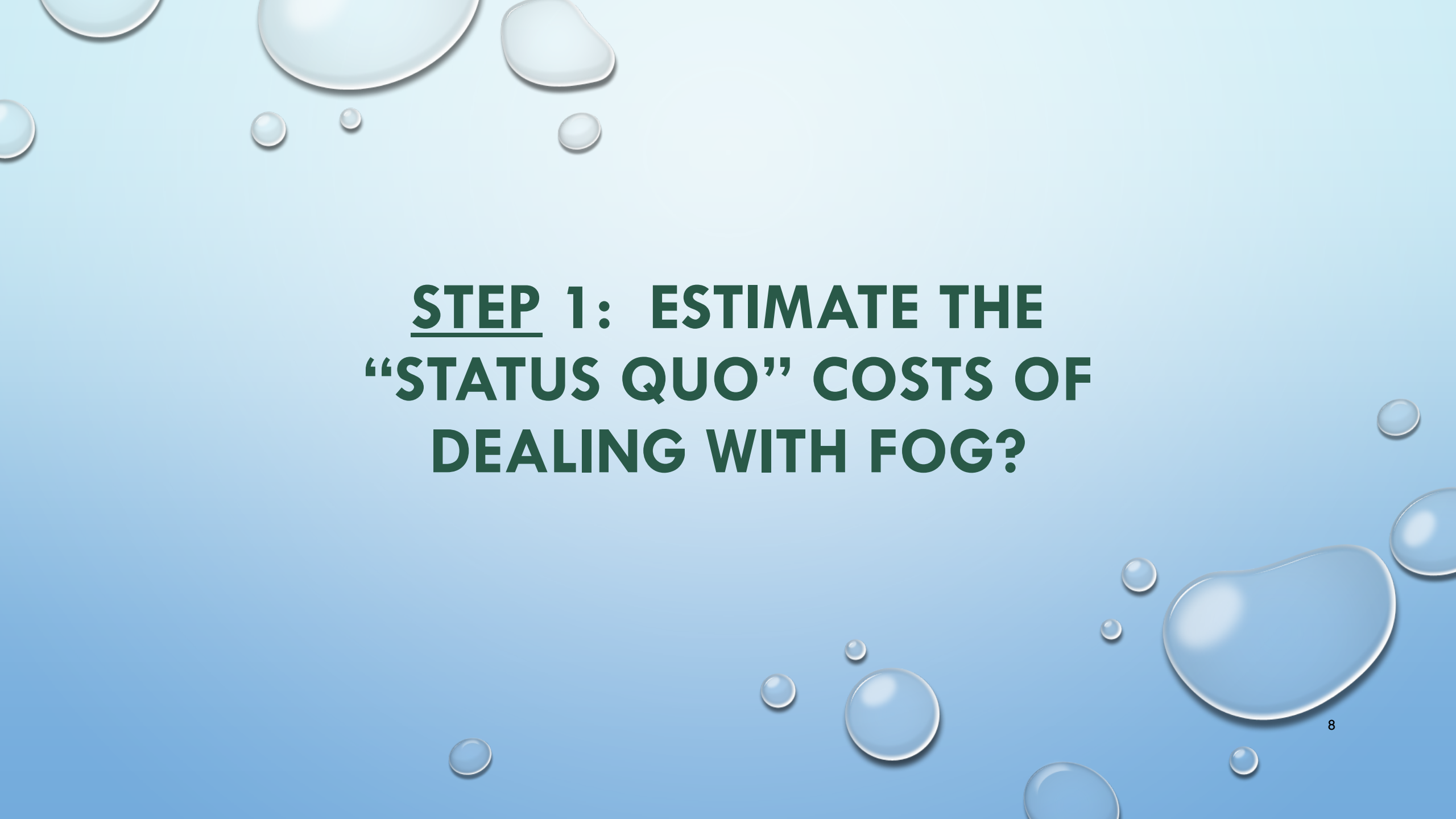


THE FOG DILEMMA: HOW DO WE ACHIEVE DESIRED RESULTS



BASIC FOG PROGRAM COST-BENEFIT ANALYSIS

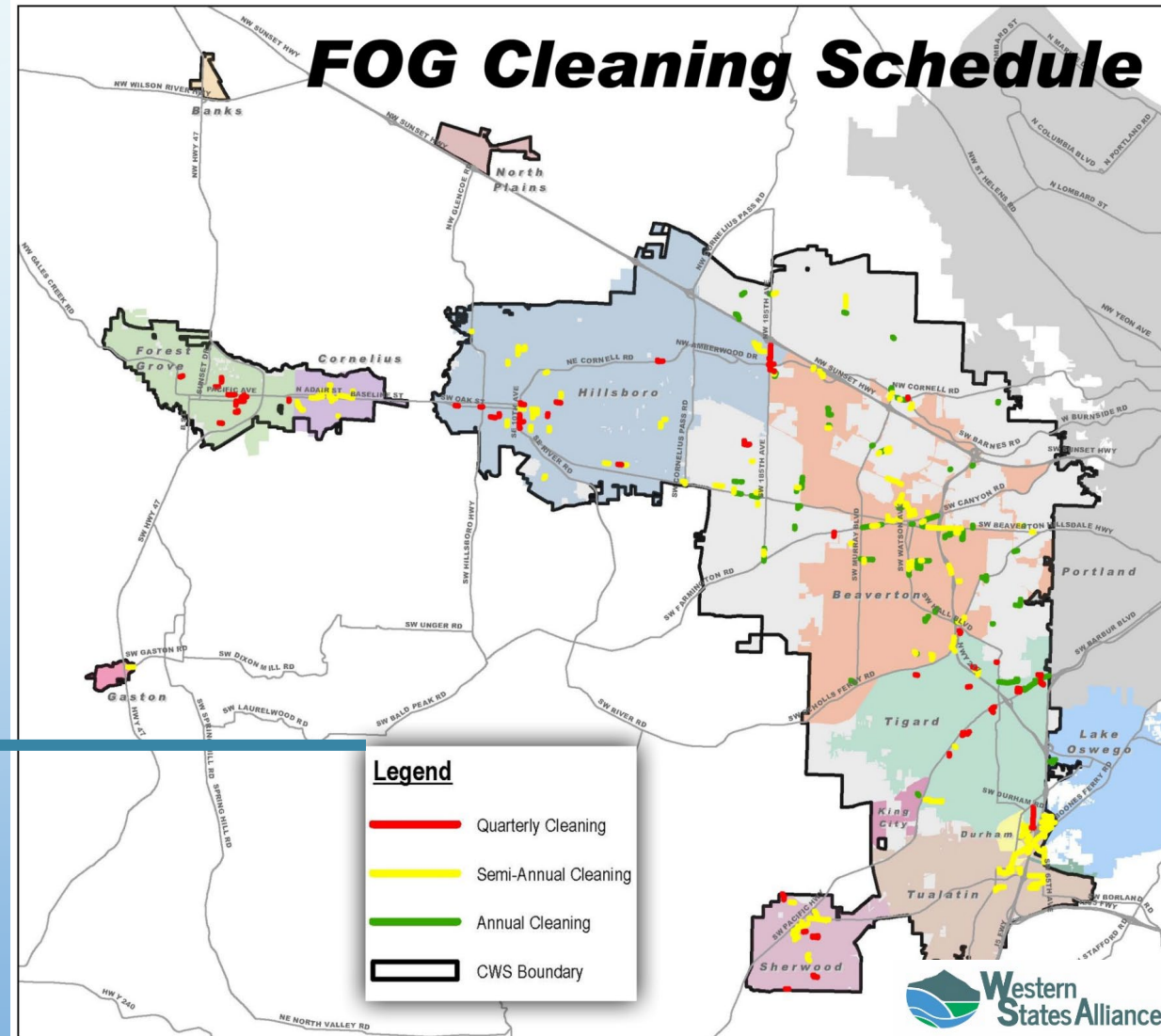
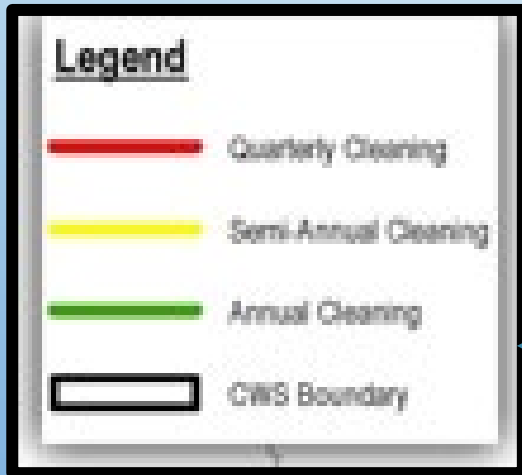
- **Step 1**: Estimate the costs if no FOG program is implemented or enhanced.
(i.e., “Status Quo” Costs)
- **Step 2**: Estimate the costs to develop and implement or enhance a FOG program to achieve desired outcomes over time.
- **Step 3**: Estimate the cost to maintain a well-managed FOG program over time.
- **Step 4**: Estimate the savings due to well-managed FOG program (i.e., reduced Status Quo costs over time).
- **Step 5**: Calculate the time period to “break-even.”

The background is a light blue gradient with several realistic water droplets of various sizes scattered across the surface. The droplets have highlights and shadows, giving them a three-dimensional appearance.

**STEP 1: ESTIMATE THE
“STATUS QUO” COSTS OF
DEALING WITH FOG?**

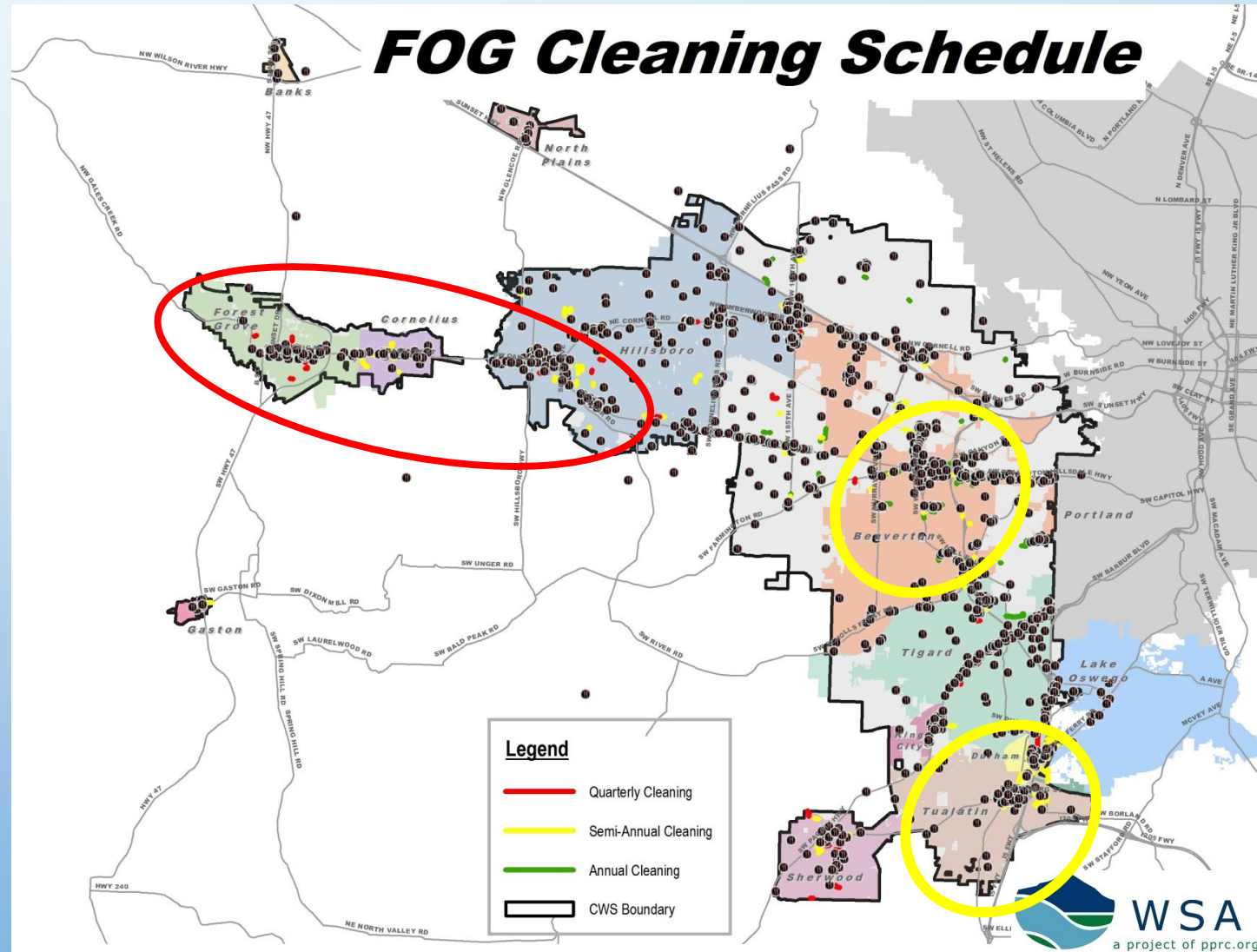
COLLECTION SYSTEM DIVISION RESOURCE ALLOCATION

TYPICAL COLLECTION SYSTEM RESPONSES TO MANAGE FOG ACCUMULATIONS



COLLECTION SYSTEM DIVISION RESOURCE ALLOCATION

- FOCUS COLLECTION SYSTEM RESPONSES TO HOT SPOT AREAS (HIGH SOURCES OF FOG)
 - RESIDENTIAL?
 - FOOD SERVICE ESTABLISHMENTS?
 - FOOD MANUFACTURERS?
- WHAT “X”% OF RESOURCES ARE SPENT IN “HOT SPOT” PORTION OF THE SERVICE AREA?



AN EFFECTIVE FOG PROGRAM PLAYS AN IMPORTANT ROLE IN COLLECTION SYSTEM RESOURCE ALLOCATION

The **FUTURE STATE** is a benefit.

CURRENT STATE STATUS QUO

80% OF RESOURCES SPENT ON NON-ROUTINE/RECURRING COLLECTION SYSTEM O&M (DUE TO FOG ACCUMULATION)

20% OF RESOURCES SPENT ON ROUTINE/NON-RECURRING COLLECTION SYSTEM O&M

EFFECTIVE
FOG
PROGRAM

FUTURE STATE

20% OF RESOURCES SPENT ON NON-ROUTINE/RECURRING COLLECTION SYSTEM O&M (DUE TO FOG ACCUMULATION)

80% OF RESOURCES SPENT ON ROUTINE/NON-RECURRING COLLECTION SYSTEM O&M

EXAMPLE OF PERFORMANCE MEASURES FOR A COLLECTION SYSTEM

Performance Measures

Indicators		FY19 Actual	FY20 Projected	FY21 Estimate
Input				
Wastewater Main Miles	These performance measures are for the entire collection system	245	250	270
Number of Connections		22,000	22,500	23,000
Sewer Backups		134	160	165
Output				
Manholes Repaired	What % of these performance measures can be attributed to FOG?	14	10	10
Number of Lines Filmed		192	75	80
Quantity Filmed (Feet)		31,192	2,000	3,000
Lines Repaired		26	36	40
Lines Located		250	120	130
Manholes Inspected		664	220	230
Lines Cleaned		36	60	70
Manholes Cleaned		54	50	60
Cleanouts Repaired	4	10	20	

“STATUS QUO” COST ELEMENTS

- **FOG-RELATED SSO RESPONSES**
- **FOG-RELATED NON-ROUTINE/RECURRING**
 - **SEWER LINE CLEANING**
 - **SEWER LINE CCTV**
 - **MANHOLE INSPECTION & CLEANING**
 - **LIFT STATION INSPECTION & CLEANING**
- **FOG-RELATED CHEMICAL/BIOLOGICAL ADDITIVES**
- **FOG-RELATED WASTEWATER TREATMENT O&M**



SSO RESPONSE FOG-RELATED LINE CLEANING COSTS

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

Column A	Column B	Column C	Column D	
Time to clean each line section (hrs)	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.

SSO RESPONSE FOG-RELATED LINE CLEANING AND DISPOSAL COSTS

1.1 SSO Response Line Cleaning Costs (FOG-Related)									
	Fiscal Year:		2023						
SSO Line Segment ID	Number Cleaning Events/Year (#/year)	Linear Line Length (feet)	Linear Line Cleaned/Year (feet/year) [B*C]	SSO Cleaning Cost/Foot (\$/ft)	Annual SSO Response Line Cleaning Cost (\$/year) [D*E]	Number of Events/Year Requiring Traffic Control	Traffic Control Cost/Event	Traffic Control Cost [G*H]	Annual SSO Response Line Cleaning Cost (\$) [D+F]
W-23	1	1,000	1,000	2.00	\$ 2,000	1	\$ 1,000	\$ 1,000	\$ 3,000
W-45	2	2,000	4,000	2.00	\$ 8,000			\$ -	\$ 8,000
E-40	3	3,000	9,000	2.00	\$ 18,000			\$ -	\$ 18,000
S-35	1	10,000	10,000	4.00	\$ 40,000	1	\$ 2,000	\$ 2,000	\$ 40,000
			-		\$ -			\$ -	\$ -
			-		\$ -			\$ -	\$ -
			-		\$ -			\$ -	\$ -
Total Annual FOG-Related SSO Response Line Cleaning	7		24,000		\$ 68,000	2		\$ 3,000	\$ 69,000

1.2 Sanitary Sewer Overflow Disposal Cost (FOG-Related)					
	Fiscal Year:		2023		
SSO Line Segment ID	Number of SSO Events/Year	Number of Gallons/SSO Event (gallons/event)	Annual SSO Disposal Gallons	Disposal Cost/Gallon (\$/gallon)	Annual FOG-Related SSO Disposal Cost [D*E]
W-23	2	1,000	2,000	\$ 0.25	\$ 500
W-45	2	3,000	6,000	\$ 0.25	\$ 1,500
E-40	1	5,000	5,000	\$ 0.25	\$ 1,250
S-35			-		\$ -
			-		\$ -
			-		\$ -
Total Annual FOG-Related SSO Disposal	5		13,000		\$ 3,250

NON-ROUTINE/ RECURRING SEWER LINE MAINTENANCE COSTS

- How many linear feet of collection system are being cleaned in excess of the normal cleaning cycle (usually once every three to five years)?
- What is the city's cost per foot to clean lines?
- How many linear feet of collection system is being televised in excess of the normal routine ?
- What is the city's cost per foot to televise lines?
- Is traffic control necessary, and if so, what is the cost?
- Where is the FOG disposed of and what is the cost of disposal?

EXAMPLE CONTRACTOR SEWER LINE CLEANING & TELEVISIONING BIDS

BID SCHEDULE				Company A		Company B	
BID ITEM NO.	ITEM DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL	UNIT COST	TOTAL
1	Mobilization and Demobilization	1	LS	\$ 1,070.00	\$ 1,070.00	\$ -	\$ -
2	Traffic Control Systems	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 41,400.00	\$ 41,400.00
3	Sanitary Sewer Cleaning of 4 Inch up to 12 Inch diameter sewer pipelines via hydroject	10,100	LF	\$ 1.90	\$ 19,190.00	\$ 1.37	\$ 13,837.00
4	CCTV Inspection of 12-Inch diameter and smaller sewer pipelines	40,300	LF	\$ 1.80	\$ 72,540.00	\$ 1.47	\$ 59,241.00

CCTV = closed-circuit television

NON-ROUTINE/RECURRING LINE CLEANING AND DISPOSAL COSTS

2.1 Sewer Line Cleaning Costs (FOG-Related, Non-SSO Related)		Fiscal Year: 2023							
Line Segment ID	Number Cleaning Events/Year (#/year)	Linear Line Length (feet)	Linear Line Cleaned/Year (feet/year) [B*C]	Cleaning Cost/Foot (\$/ft)	Non-SSO Line Cleaning Cost/Year (\$/year) [D*E]	Number of Events/Year Requiring Traffic Control	Traffic Control Cost/Event	Annual Traffic Control Cost [G*H]	Annual FOG-Related Line Cleaning Cost [F+I]
W-75	6	5,000	30,000	2.00	\$ 60,000	6	\$ 1,000	\$ 6,000	\$ 66,000
W-5	4	2,000	8,000	2.00	\$ 16,000	2	\$ 1,500	\$ 3,000.00	\$ 19,000
E-20	4	3,000	12,000	2.00	\$ 24,000	2	\$ 1,500	\$ 3,000.00	\$ 27,000
N-65	4	5,000	20,000	2.00	\$ 40,000	4	\$ 2,000	\$ 8,000.00	\$ 48,000
			-		\$ -			\$ -	\$ -
			-		\$ -			\$ -	\$ -
			-		\$ -			\$ -	\$ -
Total Annual Line Cleaning Cost (FOG-Related, Non-SSO Related)	18		70,000		\$ 140,000	14		\$ 20,000.00	\$ 160,000.00

2.2 Sewer Line Cleaning Disposal Costs (FOG-Related, Non-SSO Related)		Fiscal Year: 2023			
Sewer Line ID	Number of Cleaning Events /Year	Gallons/Event (gallons)	Annual Disposal Gallons/Year [B*C]	Disposal Cost (\$/gallon)	Annual Sewer Line Cleaning Disposal Cost [D*E]
W-75	6	1,000	6,000	\$ 0.25	\$ 1,500
			-		\$ -
			-		\$ -
			-		\$ -
			-		\$ -
			-		\$ -
Total Annual Sewer Line Cleaning Disposal (FOG-Related, Non-SSO Related)	6		6,000		\$ 1,500

NON-ROUTINE/ RECURRING PUMP STATION MAINTENANCE COSTS

- **How many pump stations are impacted by FOG?**
- **What is the cost to clean FOG from a pump station?**
- **How many air relief valves are being impacted by FOG?**
- **What is the cost to clean the air relief valves?**
- **What is the pump efficiency loss for failure to clean air relief valves?**
- **Is excess energy being used due to FOG impacts?**
- **What does it cost for chemical/biological additives used to “reduce” FOG?**

NON-ROUTINE/ RECURRING PUMP STATION MAINTENANCE COSTS

What is the cost to clean pump stations?

Column A	Column B	Column C	Column D	
Time to clean each pump station (hrs)	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?

NON-ROUTINE/RECURRING PUMP STATION CLEANING

6.1 Lift Station Inspection Costs (FOG Related)	Fiscal Year:		2023	
Lift Station ID	Lift Station Inspection Frequency (# of times/year)	Lift Station Cost/ Inspection (\$)	Annual Lift Station Inspection Cost [B*C]	
LS-1	12	\$ 150	\$ 1,800.00	
LS-4	12	\$ 150	\$ 1,800.00	
LS-6	12	\$ 150	\$ 1,800.00	
LS-8	12	\$ 150	\$ 1,800.00	
			\$ -	
			\$ -	
			\$ -	
Total Lift Station Inspections (FOG Related)	48		\$ 7,200	

6.2 Lift Station Cleaning Costs (FOG-Related)	Fiscal Year:		2023	
Lift Station ID	Lift Station Cleaning Frequency (# of times/year)	Lift Station Cleaning Cost/Event (\$/event)	Annual Lift Station Cleaning Cost [B*C]	
LS-1	6	\$ 300	\$ 1,800	
LS-4	6	\$ 300	\$ 1,800	
LS-6	6	\$ 300	\$ 1,800	
LS-8	6	\$ 300	\$ 1,800	
			\$ -	
			\$ -	
			\$ -	
Total Annual Lift Station Cleaning	24		\$ 7,200	

NON-ROUTINE/RECURRING AIR-RELIEF VALVE CLEANING

7.1 Air Relief Valve Inspection & Cleaning Costs (FOG-Related)	Fiscal Year:	2023	
Air Relief Valve ID	ARV Inspection Frequency (# of times/year)	ARV Inspection Cost/Event	Annual ARV Inspection and Cleaning Costs [B*C]
ARV LS-1-1	2	\$ 200	\$ 400
ARV LS-4-1	2	\$ 200	\$ 400
ARV LS-6-1	2	\$ 200	\$ 400
ARV LS-8-1	2	\$ 200	\$ 400
			\$ -
			\$ -
			\$ -
Total Annual FOG-Related Air Relief Valve Inspection & Cleaning	8		\$ 1,600

PUMP STATION FOG REMOVAL DISPOSAL COSTS

6.3 Lift Station Cleaning Disposal Costs (FOG-Related)		Fiscal Year:	2023			
Lift Station ID	Number of Loads/Year	Number of Gallons/Load (Gallons)	Gallons/Year	Disposal Cost/Gallon	Annual Lift Station Disposal Cost [D*E]	
LS 1	6	1000	6,000	\$ 0.25	\$ 1,500	
LS-4	6	1000	6,000	\$ 0.25	\$ 1,500	
LS-6	6	1000	6,000	\$ 0.25	\$ 1,500	
LS-8	6	1000	6,000	\$ 0.25	\$ 1,500	
			-		\$ -	
			-		\$ -	
			-		\$ -	
Total Annual LS Cleaning Disposal Cost (\$)	24		24,000		\$ 6,000	

NON-ROUTINE MANHOLE INSPECTION & MAINTENANCE COSTS

- How many manholes are impacted by FOG?
- What is the cost to inspect FOG-impacted manholes?
- What is the cost to clean FOG from a manholes?
- What is the decrease in expected life of FOG-impacted manholes?

NON-ROUTINE MANHOLE INSPECTION, FOG REMOVAL, & REPLACEMENT COSTS

Manholes									
What is the cost to inspect and maintain FOG-impacted manholes?									
Column A	Column B	Column C	Column D	Column E	Column F				
Manhole O&M	Number of Manholes	Average Labor (hrs/manhole)	Time Spent (hrs/yr) (B*C)	Fully Loaded Labor Rate (\$/hr)	Equipment Cost (\$/hr)	Total Annual Cost (\$/yr) (D*(E+F))			
Manhole inspections									
FOG Removal									
Total Annual Cost (\$/yr.)									
What is the cost to replace FOG-impacted manholes?									
Column A	Column B	Column C	Column D	Column E	Column F	Column G			
Manhole Replacement	Number of Manholes (mh)	Average Replacement Cost (\$/mh)	Time Spent (hrs/mh)	Fully Loaded Labor Rate (\$/hr)	Equipment Cost (\$/hr)	Bypass Pumping (\$/hr)	Total Annual Cost (\$/yr) ((B*C)+(D*(E+F+G)))		
Manhole replacement									
Total Annual Cost (\$/yr.)									

EXAMPLE CONTRACTOR MANHOLE INSPECTION BIDS

BID SCHEDULE				Company A		Company B	
BID ITEM NO.	ITEM DESCRIPTION	QTY.	UNIT	UNIT COST	TOTAL	UNIT COST	TOTAL
5	Complete MACP Level 1 Manhole Inspection	203	EA	\$ 75.00	\$ 15,225.00	\$ 86.50	\$ 17,559.50

Manhole Assessment and Certification Program (MACP)

Level 1 inspection produces basic assessment information regarding the general condition of a manhole.

NON-ROUTINE MANHOLE INSPECTION, FOG REMOVAL, & REPLACEMENT COSTS

5.1 Manhole Inspection Costs (FOG-Related)	Fiscal Year:	2023	
Manhole ID	Manhole Inspection Frequency (# of times/year)	Cost/ Inspection (\$/event)	Total Annual Manhole Inspection Cost [B+C]
MH-1	12	\$ 150	\$ 1,800
MH-76	12	\$ 150	\$ 1,800
MH-87	6	\$ 150	\$ 900
MH-43	6	\$ 150	\$ 900
			\$ -
			\$ -
			\$ -
Total Manhole Inspections			\$ 5,400

EXCESS WASTEWATER TREATMENT PLANT OPERATIONAL COSTS

- What is the estimated operational cost to treat one pound of COD?
- WERF estimates that one pound of FOG equals $\frac{1}{2}$ pound of COD
- Case studies show that an average restaurant, with one fixture protected by a well-maintained interceptor, only captures 1/10th the FOG of a restaurant with all fixtures and drains connected to a well-maintained interceptor.
- How many restaurants in the Jurisdiction have all fixtures and drains protected by an interceptor?

ESTIMATED FOG-RELATED WWTP COSTS

8.1 WWTP Maintenance Costs (FOG-Related)	Fiscal Year:	2023	
WWTP Maintenance	Time Spent (hrs/year)	Fully Loaded Labor Rate (\$/hr)	Annual FOG-Related WWTP Maintenance Costs (\$/yr.) [B*C]
Cleaning preliminary treatment unit	365	\$ 50	\$ 18,250
Cleaning clarifier weirs	180	\$ 50	\$ 9,000
Sludge removal from primary/secondary clarifiers			\$ -
Other:			\$ -
Other:			\$ -
Other:			\$ -
Total Annual FOG-Related WWTP Maintenance	545		\$ 27,250

ESTIMATED FOG-RELATED WWTP COSTS

8.2 Method 1 - WWTP FOG Treatment Costs for FSE Estimated FOG Production		Fiscal Year:	2023	NOTE: The estimated Annual FOG Treatment Cost (Column M) does not include the contribution from residential sources of FOG.								
WWTP FOG Treatment & FOG Production	Number of FSEs (with Grease Removal Device) (#)	Average Number of Seats/FSE	Average Number of Meals Served/Day/FSE	Average FOG Production* (lbs./meal)	FOG Produced/Year (lbs.) [B*D*E*365]	GRD Removal Efficiency (%)	FOG Captured By GRDs (lbs./year) [F*G/100]	Grease Removal Device Bypass** (lbs./year) [F*(1-G/100)]	Percent of FOG Estimated to Reach the WWTP (%)	COD to WWTP*** (lbs./year) [(I*/100)*0.5]	Treatment Cost of COD (\$/lb COD)	Annual FOG Treatment Cost [K*L]
WWTPs - Low/no flatware	100	30	300	0.0050	54,750	85	46,538	8,213	75	3,080	0.25	\$ 770
WWTPs - Low/flatware	50	30	300	0.0065	35,588	85	30,249	5,338	75	2,002	0.25	\$ 500
WWTPs - Medium/no flatware	200	30	300	0.0250	547,500	85	465,375	82,125	75	30,797	0.25	\$ 7,699
WWTPs - Medium/flatware	100	30	300	0.0325	355,875	85	302,494	53,381	75	20,018	0.25	\$ 5,004
WWTPs - High/no flatware	100	30	500	0.0350	638,750	85	542,938	95,813	75	35,930	0.25	\$ 8,982
WWTPs - High/flatware	100	30	500	0.0455	830,375	85	705,819	124,556	75	46,709	0.25	\$ 11,677
WWTPs - Very High/no flatware	50	30	500	0.0580	529,250	85	449,863	79,388	75	29,770	0.25	\$ 7,443
WWTPs - Very High/flatware	50	30	500	0.0750	684,375	85	581,719	102,656	75	38,496	0.25	\$ 9,624
Total	750				3,676,463		3,124,993	551,469		206,801		\$ 51,700

8.2 Method 2 - WWTP Treatment Costs for FOG Influent Concentration		Fiscal Year:	2023	NOTE: The estimated Annual FOG Treatment Cost (Column G) includes the contribution from both FSE and residential sources of FOG.			
WWTP Number	Average Influent FOG Concentration* (mg/L)	WWTP Daily Flow (MGD)	Influent FOG (lbs./day) [B*8.34*C]	Influent COD from FOG** (lbs./year) [D*365*0.5]	Cost to Treat COD (\$/lb)	Annual FOG Treatment Cost [E*F]	
WWTPs (The influent concentration and flow is for all WWTPs combined)	50	8.0	3,336	608,820	0.25	\$ 152,205	
Total WWTP Treatment for FOG Influent		8.0	3,336	608,820		\$ 152,205	

EXAMPLE OF THE ESTIMATED TOTAL ANNUAL POTW “STATUS QUO” COSTS SPREADSHEET

POTW Status Quo Costs		Date:	XX/XX/20XX	
		Version Number:	X	
Fiscal Year	2023			
Item	Annual Cost (\$)	Legend		
1.1 SSO Response Cleaning (FOG Related)	\$ 69,000	Input	Change font color after data entry	
2.1 Sewer Line Cleaning (Non-SSO, FOG Related)	\$ 160,000	Calculated	Don't enter data into cell	
3.1 Backup Response and Cleaning (FOG Related)	\$ 78,000	Linked Cell	Linked to cells in this Notebook	
4.1 CCTV Costs (FOG Related)	\$ 160,000			
5.1 Manhole Inspection (FOG Related)	\$ 5,400			
6.1 Lift Station Inspections (FOG Related)	\$ 7,200			
6.2 Lift Station Cleaning (FOG Related)	\$ 7,200			
7.1 Air Relief Valve Inspection & Cleaning (FOG Related)	\$ 1,600			
8.1 WWTP Maintenance (FOG Related)	\$ 27,250			
8.2 WWTP Treatment	\$ 152,205	Method 1	\$ 51,700 (FSE GRD FOG Bypass)	Method 2 \$ 152,205 (WWTP FOG Influent)
9.1 Additives Used	\$ 66,000			
10.0 Total Disposal (SUM of 1.2+2.2+3.2+5.3)	\$ 9,500			
Total Annual POTW Status Quo Cost	\$ 743,355			

CALCULATE THE ANNUAL STATUS QUO COSTS

- PROJECT ESTIMATED COSTS FOR 5 YEARS FOR EACH COST CATEGORY FOR SSOS, LINE CLEANING, INSPECTIONS, ETC.
- USE SAME CATEGORIES FOR EACH YEAR
- THE COSTS CAN BE ESTIMATED FOR EACH YEAR FOR YEARS 2 THROUGH 5



**STEP 2: ESTIMATE THE COST TO
DEVELOP AND IMPLEMENT OR
ENHANCE THE FOG PROGRAM?**

ELEMENTS OF AN EFFECTIVE FOG PROGRAM



- How many staff will you need?
- How will your staff spend their time?
- How much will it cost?

STAKEHOLDER INVOLVEMENT COSTS

- Have you identified the stakeholders?
- Have meetings been scheduled to discuss the FOG Program with stakeholders?
- Has the business case been presented to the municipal leadership?
- One sewer district spent one year meeting with stakeholders in monthly meetings. Four staff members from the District were involved, three part time and one full time during this year.
- What are the estimated fully-loaded labor costs to get input from stakeholders?

ESTIMATE FOG PROGRAM STAFF COSTS

- How many FSEs are in your service area?
- How many FSE inspections can be completed in one day, month, or year?
- How many Full Time Employees (FTEs) will be needed to initiate the program?
- How many FTEs (and their classifications) will be needed to maintain the program?
- What is the fully-loaded labor cost for each classification of FTE?

FSE INSPECTION PRIORITIES

FOG Cleaning Schedule

**Red Dots = Hot Spots or FOG-Lines
Cleaned Quarterly**

Legend

- Quarterly Cleaning
- Semi-Annual Cleaning
- Annual Cleaning
- CWS Boundary

FSEs Located In or Near FOG-Lines

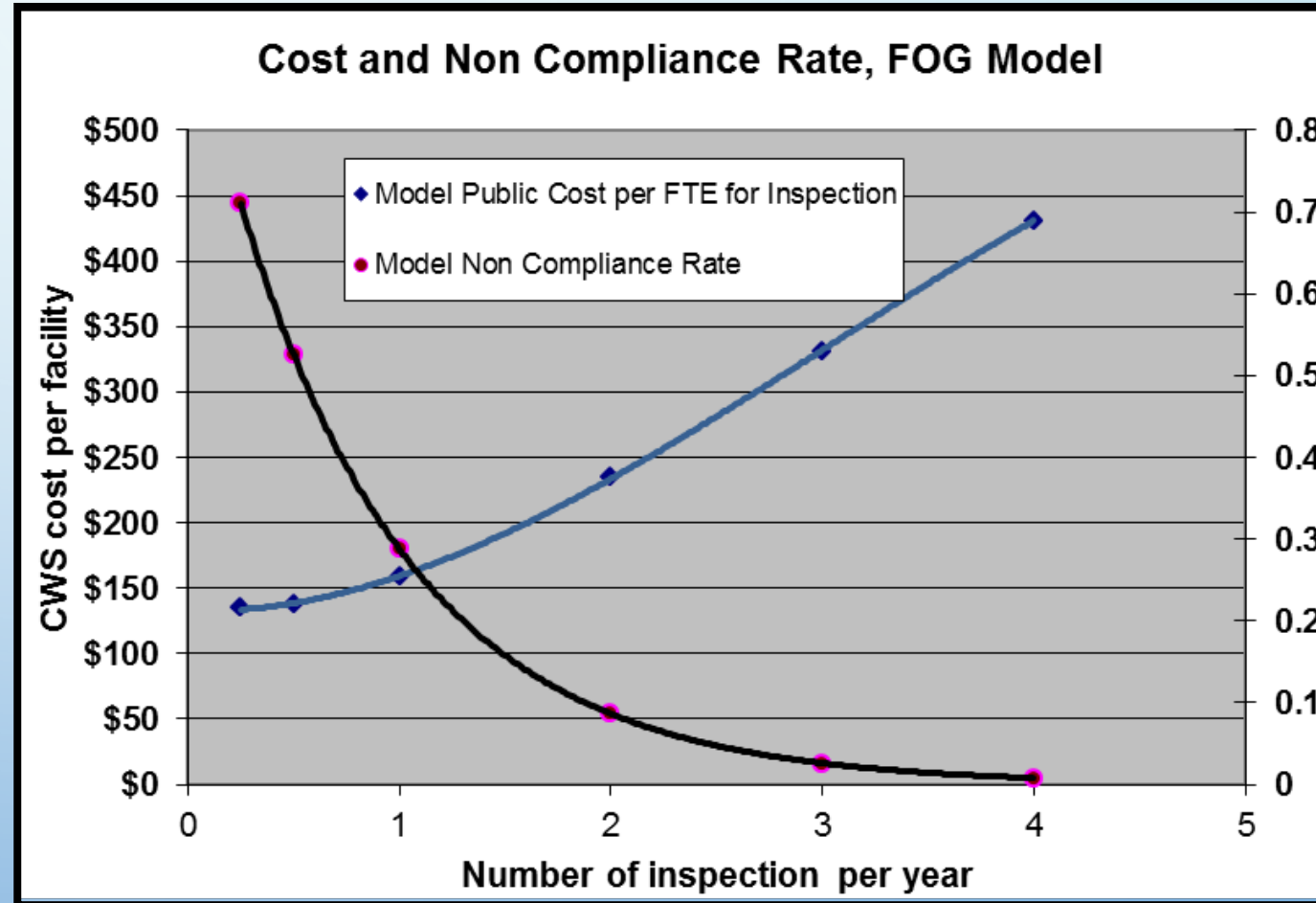
Black Dots = Hot Spots or FOG-Lines

Legend

- Quarterly Cleaning
- Semi-Annual Cleaning
- Annual Cleaning
- CWS Boundary

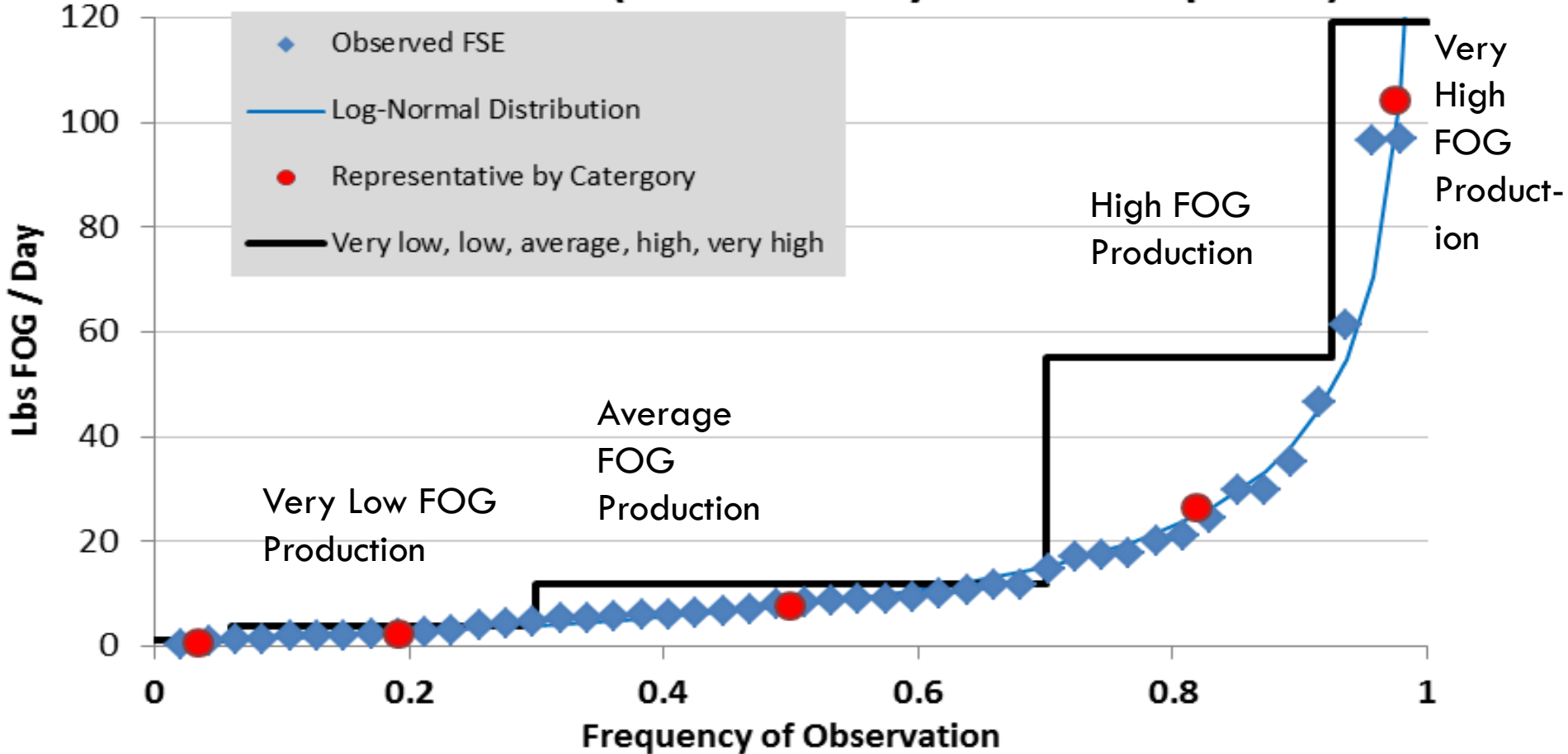
- **CURRENT, ALL FSES / YEAR**
 - INITIAL INSPECTIONS, STATUS
 - ANNUAL INSPECTION (OBSERVE AT LEAST ONE PUMP OUT)
 - INSPECTIONS SIMILAR FOR ALL FSES
- **PRIORITIZED INSPECTION**
 - 15-30% OF FSES – HOT SPOT AREAS AND HIGH & VERY HIGH FOG PRODUCERS
 - RESULTS-ORIENTED INSPECTIONS AND FOLLOW-UP
 - TECHNICAL SUPPORT TO FSE
 - CONSISTENT INSPECTOR TRAINING, BY JURISDICTION
 - PROGRAM SUPPORT BY JURISDICTION
 - EXPECTATIONS SPECIFIC BY EACH JURISDICTION

INSPECTION COST VS. NON-COMPLIANCE RATE



NOT ALL FSES GENERATE THE SAME FOG LOAD

Distribution FSEs (Grease Study + Field Response)

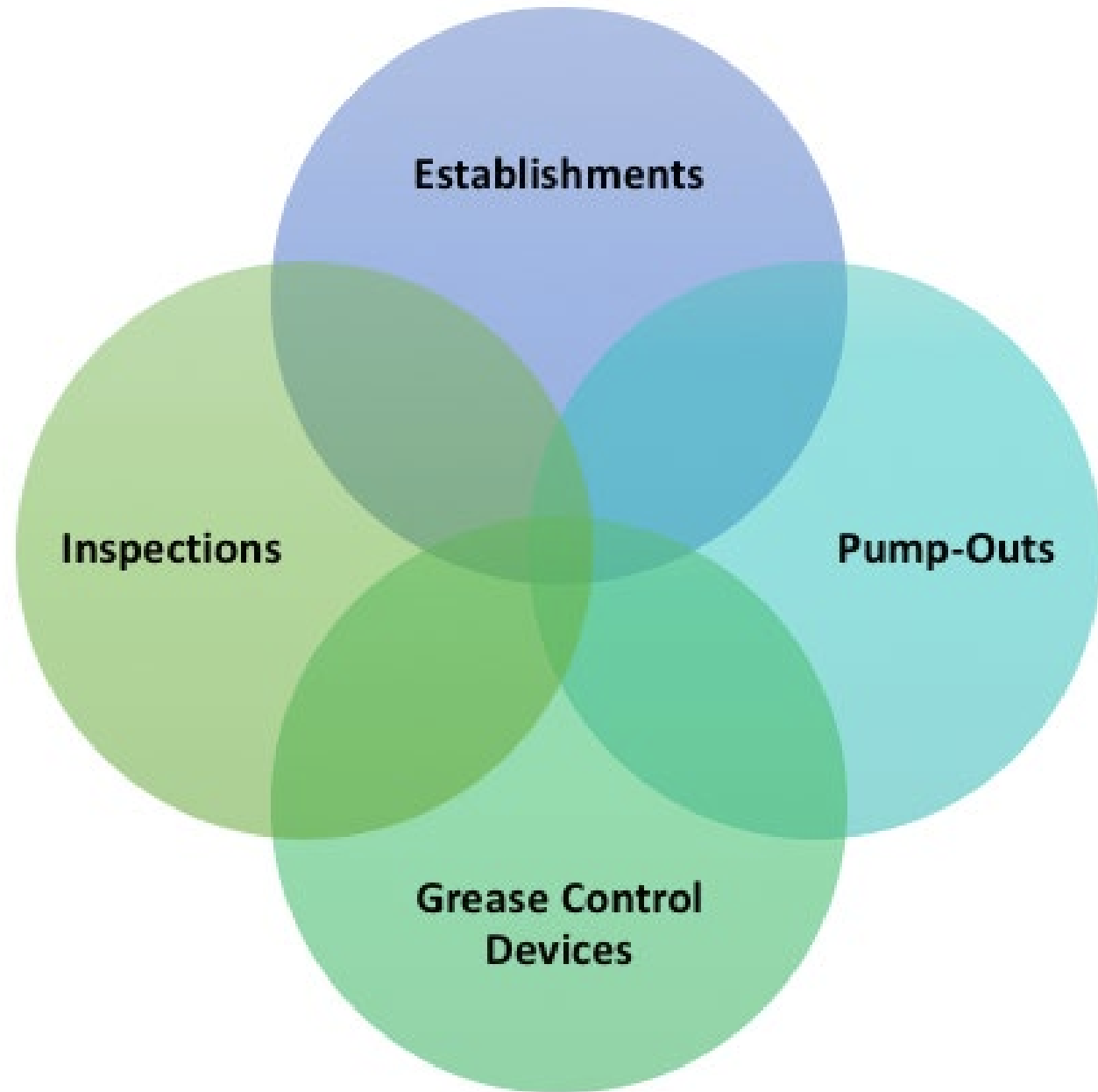


WHAT STAFFING LEVEL IS APPROPRIATE?

- Initial FSE inspection setting up FOG Program estimate ~3-4 hrs./FSE
- Efficient FOG program maintenance inspections estimate ~1-2 hrs./FSE
 - Include travel time to and from the FSE
 - Include inspection data entry time
 - Include pump-out manifests review time
- Estimate that ~10-20% FSEs will need re-inspection more frequently than once per year
- Prioritize FSE inspections

INFORMATION MANAGEMENT SYSTEM

Track Data &
Information for each
Element



EXAMPLE FOG PROGRAM LABOR COSTS SPREADSHEET

Labor Hours - FY 20XX (Year 1)			
Pretreatment Coordinator Task	# of FSEs	Hrs/FSE	Total Hrs.
Information Mgmt DB Set-up (estimated time based on using Software)	350	1.0	350.0
DB Maintenance (Sum of Initial+Routine+Non-routine inspections.)	185	1.0	185.0
Inspections - Initial (20% of FSEs in hot spot areas & ~30% of FSEs categorized as high and very-high grease producers)	175	3.0	525.0
Inspections - Routine	0	1.5	0.0
Inspections - Non-routine	10	2.0	20.0
Sampling Inspections	350	2.0	700.0

Reviews (w/ Bldg. Dept.)	10	2.0	20.0
Construction Inspections (w/ Bldg Dept)	10	2.0	20.0
Enforcement-related (10%)	35	2.0	70.0
Reports (monthly & annual)			120.0
Training			60.0
Misc. (mtgs., special projects, etc.)			120.0
Other:			
Sub-total			2190.0
Pretreatment Coordinator FTE (2,000 hrs/yr.)			1.10

EXAMPLE FOG PROGRAM LABOR COSTS SPREADSHEET

Labor Cost - FY20XX (Year 1)				
Position	FTE Fraction	Salary	Benefits	Total Cost
Utility Director	0.10	\$ 110,000	\$ 50,000	\$ 16,000
FOG Staff	1.10	\$ 70,000	\$ 25,000	\$ 104,025
Administrative	0.15	\$ 45,000	\$ 15,000	\$ 9,000
Total Labor Cost				\$ 129,025

EXAMPLE FOG PROGRAM OPERATING COSTS SPREADSHEET

Operating Cost - FY 20XX		
FOG Program Development (Consultant FOG project cost)	\$ -	
Info Mgmt Software	\$ -	
Testing Equipment & Supplies	\$ 4,760	2-1.25 inch dia. sludge judge extensions @ \$150 ea. = \$300, 2-sampling poles @\$85 ea. = \$160, 2-portable H2S monitors @\$200 ea. = \$400 pH/temperature probes - \$300 Sampling jugs - \$400/yr Sampler tubing - \$1,000/year Batteries \$50/yr Fuel - \$650/yr Misc. - \$1,500
Laptop Computer	\$ -	NBU already has
Tools & Inspection Supplies	\$ 400	Estimated cost in FY 2023 to purchase flashlights, shovels, disposable gloves, cleaners, paper towels, pick, pipe wrench, etc. See FSE Inspection SOP for list.
Office Equipment	\$ -	NBU has file storage already

Postage	\$ -	NBU has file storage already 5,000 mailouts at \$0.75 ea. = \$3,750
Printing Outreach & Education and Other Materials for FSEs	\$ 1,290	FSE 3-fold, color, 2-sided, Brochures - 1,000 at \$0.27 ea. = \$270 Printing, color - 500 pages @ \$0.60 ea. = \$300 FSE Kitchen BMP Posters - 8 1/2 x11 color, laminated - 500 at \$1.02 ea. = \$510
Printing Public O & E Materials for Residential and Multi-family	\$ 3,750	Res. 3-fold, color, 2-sided Brochures - 10,000 at \$0.35 ea. = \$3,500 Door Hangers, color, 2-sided, 3.67 x 8.5, perforated - 1,000 at \$0.25 ea. = \$250
Laboratory Costs	\$ 35,000	For Surcharge sampling: 350 grab samples at \$100/sample (includes the cost of supplies for COD= \$1,400 and TSS= \$520
Marketing/Social Media	\$ 4,000	Estimate to develop and maintain FOG web pages and other platforms. Includes FOG giveaways at \$1,000.
Office Supplies	\$ 3,500	350 Current FSE Files @ \$10/FSE; manilla folders, paper
Total Operating Cost	\$ 52,700	

EXAMPLE FOG PROGRAM TRAINING COSTS SPREADSHEET

Training & Travel Cost - FY 20XX (Year 1)				
Training Event	# of Events	Cost/Event	Cost	Comment
Pretreatment Workshop Registration	2	\$ 150.00	\$ 300.00	
Lodging @ \$96/night	6	\$ 96.00	\$ 576.00	GSA rate
Per-diem @ \$55/day	8	\$ 55.00	\$ 440.00	GSA rate
Travel Cost (milage or air)			\$ 281.25	Estimate 450 mi. RT @\$0.625/mi
Total Training & Travel			\$ 1,597.25	for 2 staff

STEP 3: ESTIMATE THE COSTS TO MAINTAIN A WELL-MANAGED FOG PROGRAM

- PROJECT ESTIMATED COSTS FOR 5 YEARS FOR EACH COST CATEGORY FOR LABOR, OPERATING COSTS, AND TRAINING
- THESE COSTS CAN BE ESTIMATED FOR EACH YEAR FOR YEARS 2 THROUGH 5

The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

- **STEP 4: ESTIMATE THE SAVINGS
DUE TO WELL-MANAGED FOG
PROGRAM**

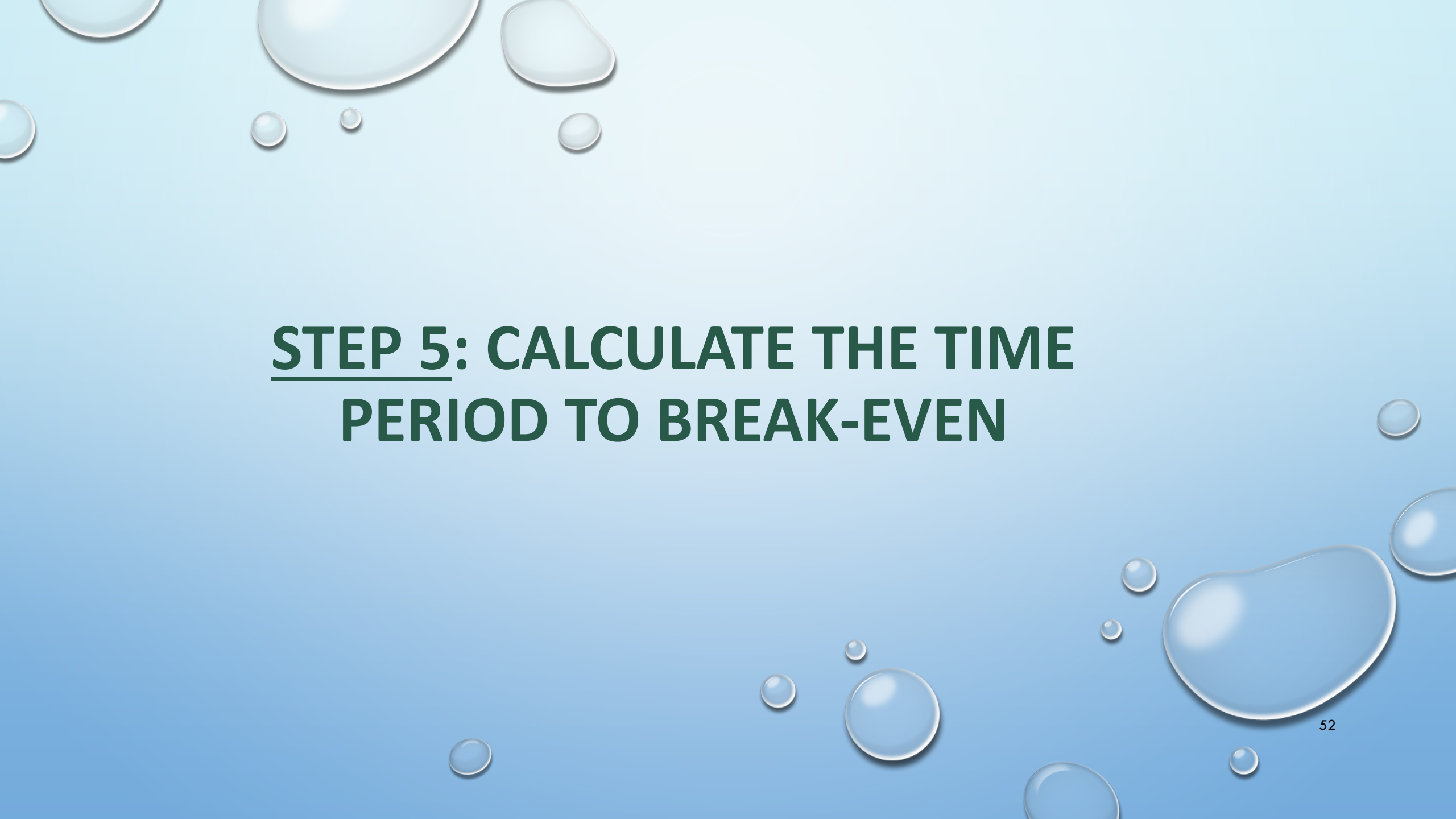
ANNUAL POTW COSTS OVER FIVE-YEARS

			POTW O&M Cost After FOG Program Implementation						
			<p>** Enter a % reduction for year-to-year for consecutive years using the percentage to the right.</p> <p>Actual data would be used (i.e., 50% reduction for Year 1, Year 2 = 50% reduction of Year 1, Year 3 = 50% of Year 2, etc.)</p>						
Status Quo Estimated POTW O&M Costs to Deal with FOG	Cost Basis Assumptions*	Status Quo Annual Cost Year 0	5-Year Status Quo Cost	Year 1 Annual Cost**	Year 2 Annual Cost**	Year 3 Annual Cost**	Year 4 Annual Cost**	Year 5 Annual Cost**	% Reduction Over 5 Years (C-1)/100
Cost to respond to SSOs caused by FOG	14 - SSOs@ \$2,500 ea. = \$12,500	\$ 135,000	\$ 675,000	\$ 94,500	\$ 66,150	\$ 46,305	\$ 32,414	\$ 22,689	83%
Cost to dispose of SSO-related wastewater	32,500 gallons.@ \$0.05/gal. =	\$ 1,625	\$ 8,125	\$ 1,138	\$ 796	\$ 557	\$ 390	\$ 273	83%
Cost to clean sewer lines caused by FOG	1,200 ft @ \$1.50/ft = \$1,800	\$ 1,800	\$ 9,000	\$ 1,260	\$ 882	\$ 617	\$ 432	\$ 303	83%
Cost to dispose of FOG removed from cleaning sewers	10,000 gal. @ 0.05/gal = \$500	\$ 500	\$ 2,500	\$ 350	\$ 245	\$ 172	\$ 120	\$ 84	83%
Cost to respond to residential and commercial sewer backups due to FOG	20 @ \$1,000/event = \$20,000	\$ 20,000	\$ 100,000	\$ 14,000	\$ 9,800	\$ 6,860	\$ 4,802	\$ 3,361	83%
Cost to dispose of FOG removed from sewer backups	20 @ 500 gal. ea. @ \$0.05/gal = \$50	\$ 50	\$ 250	\$ 35	\$ 25	\$ 17	\$ 12	\$ 8	83%

30%

ANNUAL POTW COSTS OVER FIVE-YEARS

Cost to respond to residential and commercial sewer backups due to FOG	20 @ \$1,000/event = \$20,000	\$ 20,000	\$ 100,000	\$ 14,000	\$ 9,800	\$ 6,860	\$ 4,802	\$ 3,361	83%
Cost to dispose of FOG removed from sewer backups	20 @ 500 gal. ea. @ \$0.05/gal = \$50	\$ 50	\$ 250	\$ 35	\$ 25	\$ 17	\$ 12	\$ 8	83%
Cost to inspect manholes, lift stations, and air relief valves	100 manholes insp. @ 1/yr = \$20/yr @ \$100 ea. = \$78,000 5 LS insp @ 52/yr @ = 208/yr @ \$150 ea. = \$39,000 20 LS cleanings/yr @ \$1,350 ea. = \$27,000/yr	\$ 144,000	\$ 720,000	\$ 100,800	\$ 70,560	\$ 49,392	\$ 34,574	\$ 24,202	83%
Cost of additives for FOG (e.g., lift stations)	4 - lift stations @ \$56,000/yr. for all.	\$ 56,000	\$ 280,000	\$ 39,200	\$ 27,440	\$ 19,208	\$ 13,446	\$ 9,412	83%
Cost to dispose of FOG removed from manholes, lift stations, and air relief valves	20 events @ 1,000 gal. ea. @ \$0.05 gal.	\$ 1,000	\$ 5,000	\$ 700	\$ 490	\$ 343	\$ 240	\$ 168	83%
Cost to treat FOG discharged to the WWTP	350 FSEs @ 2,000 lbs/yr./FSE @ 0.5 lbs.COD./lbs./FOG @ \$0.26/lb. = \$30,000	\$ 91,000	\$ 455,000	\$ 63,700	\$ 44,590	\$ 31,213	\$ 21,849	\$ 15,294	83%
Cost for increased WWTP O&M due to FOG	1 hrs/day @ 365 days/yr @ \$35/hr (loaded-rate) = \$12,775	\$ 12,775	\$ 63,875	\$ 8,943	\$ 6,260	\$ 4,382	\$ 3,067	\$ 2,147	83%
Other Costs:	Misc. @ ~10%	\$ 50,000	\$ 250,000	\$ 35,000	\$ 24,500	\$ 17,150	\$ 12,005	\$ 8,404	83%
Annual FOG-Related POTW Costs to Deal with FOG After Implementation of the Enhanced FOG Program		\$ 513,750	\$ 2,568,750	\$ 359,625	\$ 251,738	\$ 176,216	\$ 123,351	\$ 86,346	83%

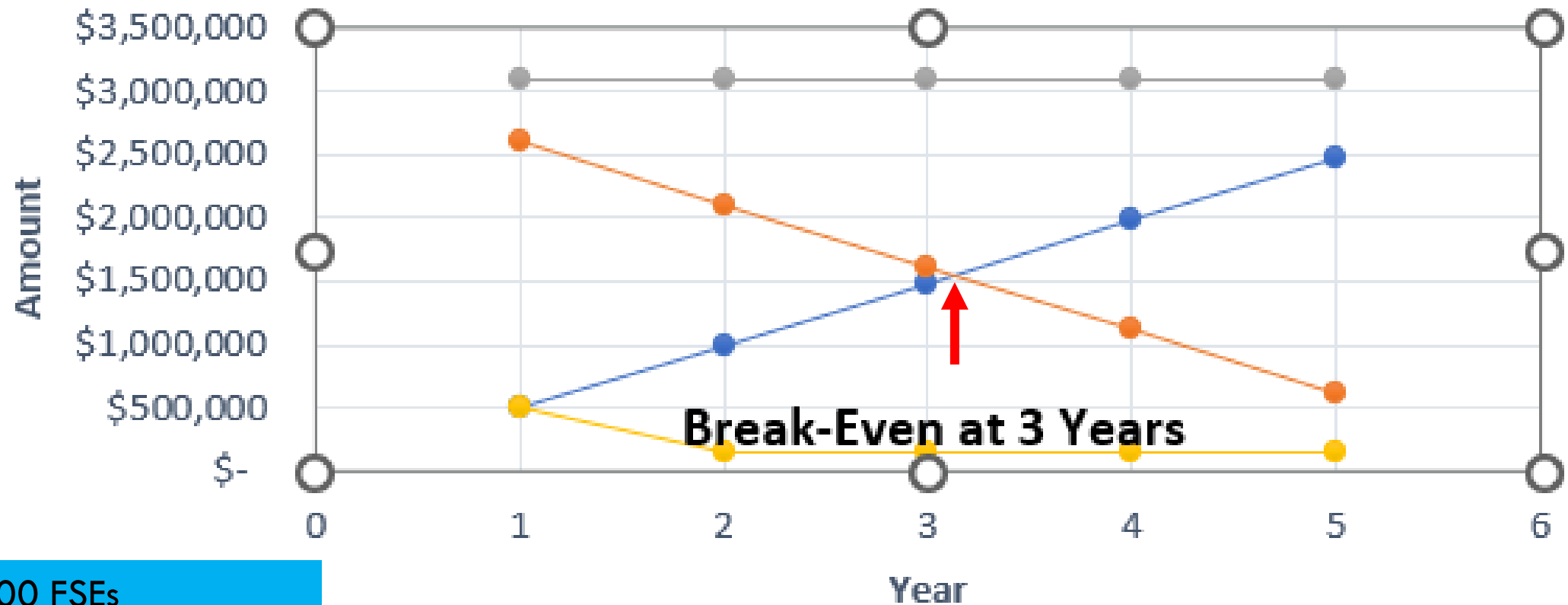
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STEP 5: CALCULATE THE TIME PERIOD TO BREAK-EVEN

EXAMPLE OF A BUSINESS CASE PRESENTATION ON COST-BENEFITS

Sample Cost-Benefit Analysis		2,300 FSEs	4 New FSE/Month		80% Cost Reduction
Status Quo Annual		FOG Program Costs		Savings after 5 years,	
Item	Cost	Item	Cost	Item	Cost
# lineal feet /yr	\$180,000	Development	\$120,500	Line Cleaning	\$36,000
Pump Station	\$45,000	1st Inspection	\$375,000	Pump Station	\$9,000
Air Relief	\$10,000	Ongoing Insp	\$90,000	Air Relief	\$2,000
FOG Disposal	\$22,000	Plan Review	\$6,000	FOG Disposal	\$4,400
WWTP maintenance	\$35,000	Data Mgmt	\$45,000	WWTP Maintenance	\$7,000
WWTP Operations	<u>\$2,800,000</u>			WWTP Operation	\$560,000
Total Cost	\$3,092,000			Total Cost Savings	\$618,400
		Development Cost & First Insp	\$495,500		
		Program Maintenance Cost	\$141,000	Total Savings after 5years	\$2,473,600

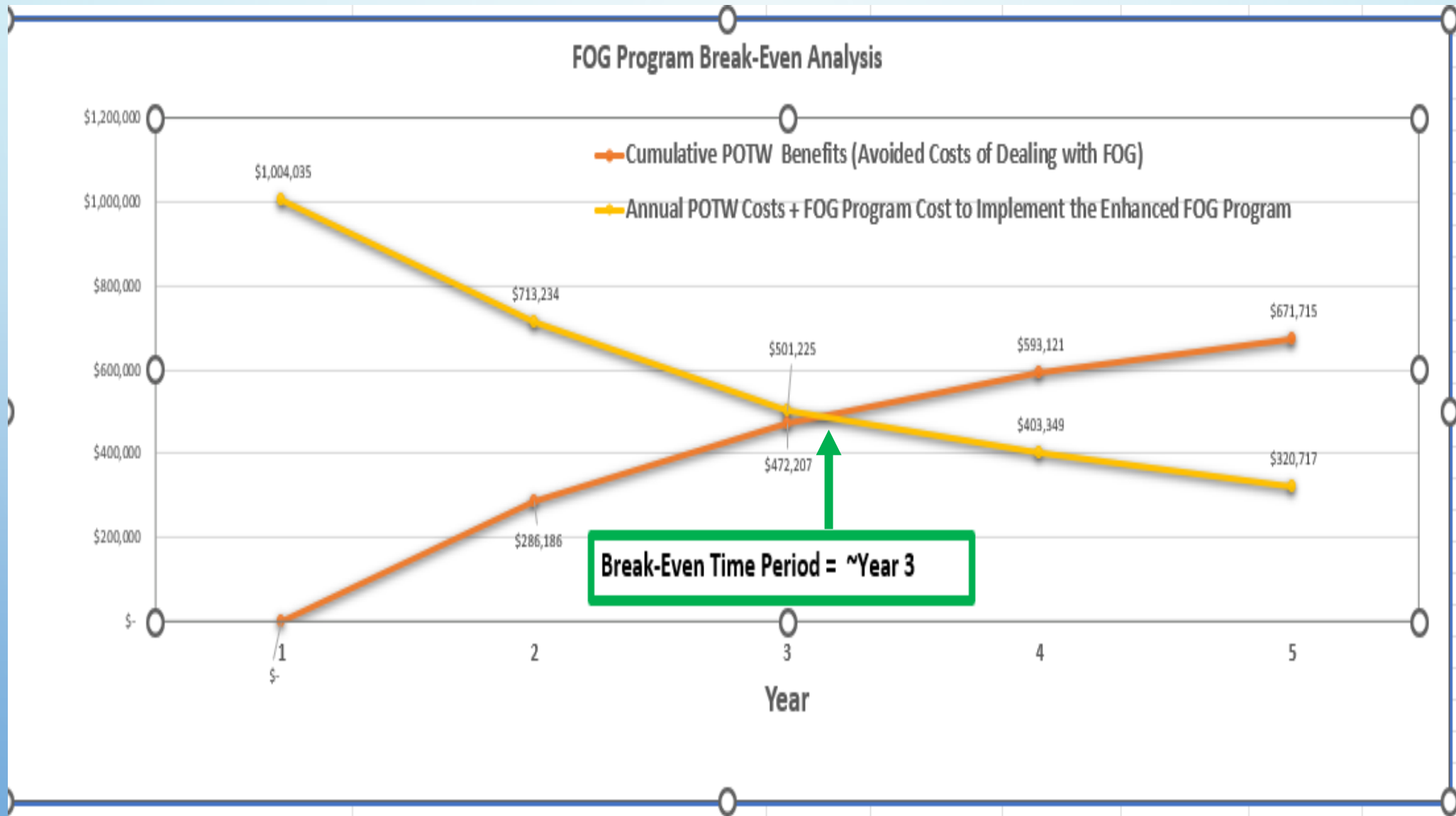
Simple FOG Program Cost-Benefit Analysis



2,300 FSEs
4 new FSEs/Month

- Cum POTW Savings
- POTW Cost After Savings
- Status Quo Cost
- FOG Prog Cost

EXAMPLE FOG PROGRAM BREAK-EVEN ANALYSIS



QUESTIONS?



don't stop your curiosity,



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