

# **Compliance Improvement Strategies for Wastewater Treatment Plants**

**Water Quality Seminar  
Austin, TX.**

**September 17, 2014**

**David James**

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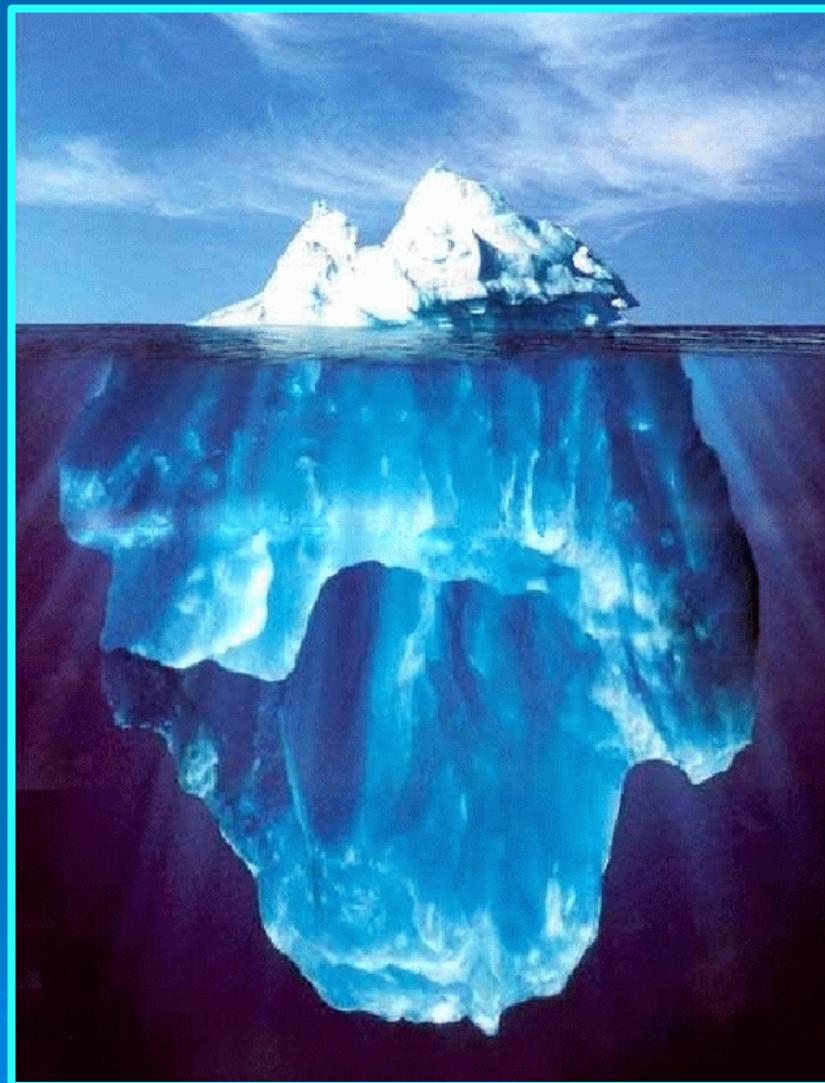
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Water Quality Division**

**Texas Commission on Environmental Quality**

# Today's Topics

- Common Types of Violations
- Tips to Prevent Violations and Resources
- Source Control Examples and Resources
  - Brewery
  - Food Preparation
  - Mercury
  - Phosphorous



# Typical Violations of TPDES Permit Conditions

## ➤ Failure to:

- Maintain compliance with effluent limits
- Prevent visible floating solids or oil and trace amounts of foam in effluent

Visible floating solids  
(grease balls)  
in chlorine contact basin



# Preventing Bacteria Limit Violations

- Adequate mixing
- 20 minutes detention time at peak flow
- No short circuiting
- No excess sludge in contact tank
- Keep secondary clarifier weirs clean to reduce suspended solids loading (algae)
- Effects of Ammonia on  $\text{Cl}_2$  demand



# TCEQ's Small Business and Local Government Assistance Program



- Troubleshooting Bacteria Effluent from Wastewater Treatment Plants (RG-515)
- Operational Issues that Contribute to Bacteria-related Violations
- Wastewater Treatment Plants: Bacteriological Testing

<http://TexasEnviroHelp.org>

(Water Compliance Resources/ Wastewater Compliance Resources)

# Typical Violations of TPDES Permit Conditions

- Failure to provide notification of:
  - Effluent violations exceed limit by 40%
  - Domestic WWTPs that reach 75% and 90% of permitted flow
  - Unauthorized discharges

# Unauthorized Discharges and Reporting Guidance

- Unauthorized Discharges and Sanitary Sewer Overflows, RG-395



## **TCEQ REGULATORY GUIDANCE**

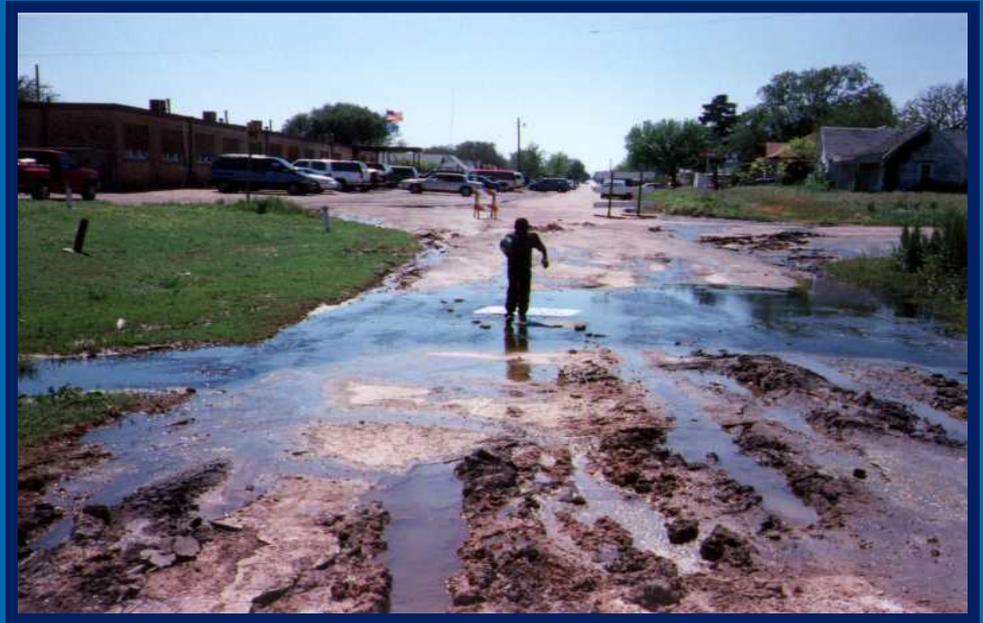
Field Operations Support Division

RG-395 • Revised April 2011

## **Unauthorized Discharges and Sanitary Sewer Overflows**

- TCEQ's Sanitary Sewer Overflow Initiative
  - <http://www.tceq.texas.gov/field/ssoinitiative>

# Unauthorized Discharges & Impacts



# Typical Violations of TPDES Permit Conditions

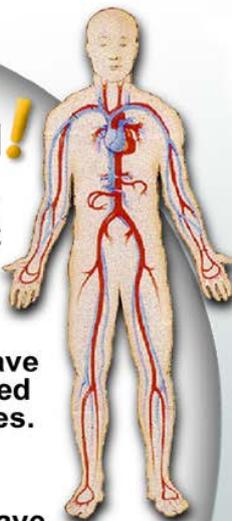
## ➤ Failure to:

- Properly operate and maintain the sewer collection system and the WWTP
- Calibrate flow measurement devices
- Calibrate laboratory testing equipment
- Conduct process control tests
- Maintain solids inventory

# Fats, Oils, and Grease Prevention

**Grease** is like cholesterol!

- Cities have been on a high fat diet for far too long.
- We have blocked arteries.
- Cities have spent millions on angioplasty.
- Cities spend millions every year to combat the ongoing problem.
- If we don't change our diet...and follow an exercise program... the problem will recur.





**Mass Roots**

250

# Sewer Collection System Preventative Maintenance



Mass roots, 85 % cross-sectional area loss, from 12 to 12 o'clock

2002-02-14

44.89m



06/08/04

+0005.1ft↑  
01:47:05p

Waukesha  
Summit Ave.  
CONCRETE, 12"

306  
307

inspection begins at upstream manhole

# TPDES Discharge Permit – Monitoring and Reporting Requirement

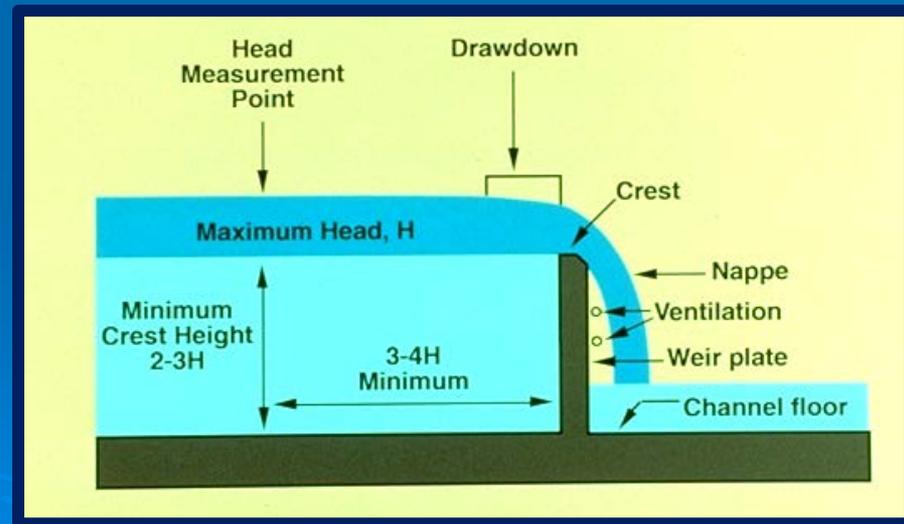
## ➤ Calibration of Instruments

- All automatic flow measuring or recording devices and all totalizing meters
- Accurately calibrated by a trained person at plant start-up
- Calibrated as needed to ensure accuracy, but not less often than annually

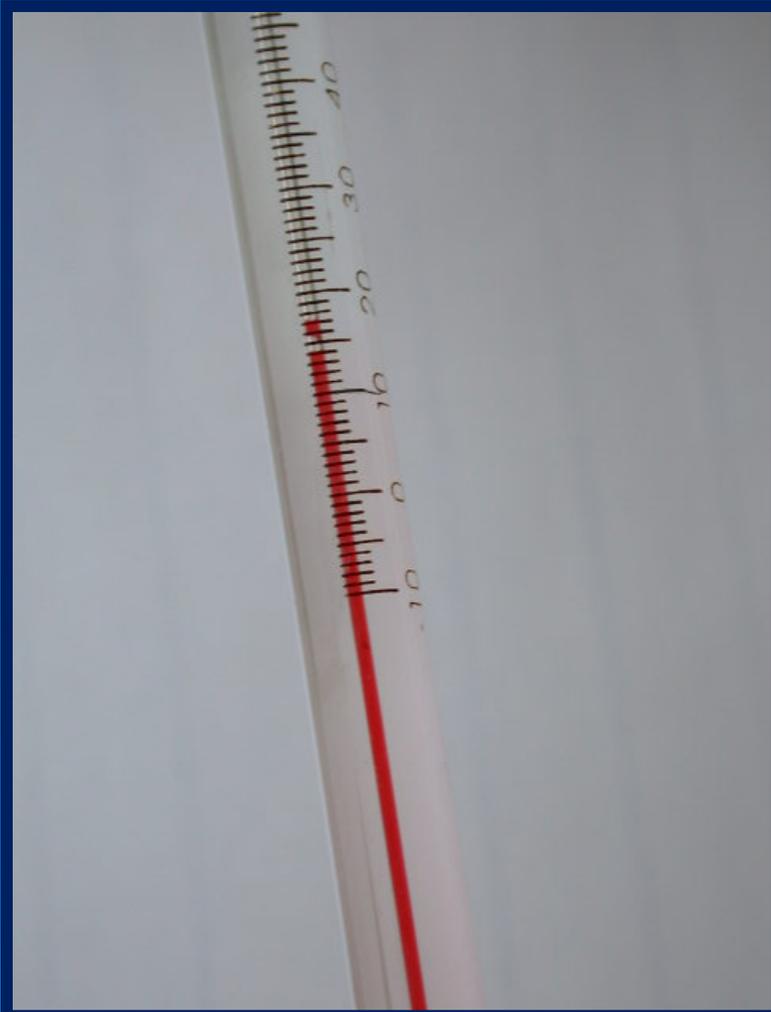
# Flow Measurement Calibration Challenges



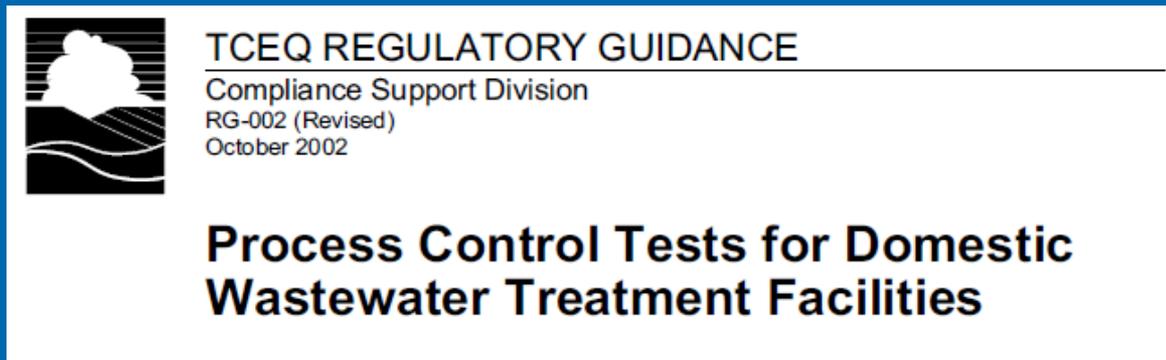
- 30 TAC 319.11(d)
- References flow measurements, equipment, installation, and procedures



# Composite Sample Collection & Preservation Tip

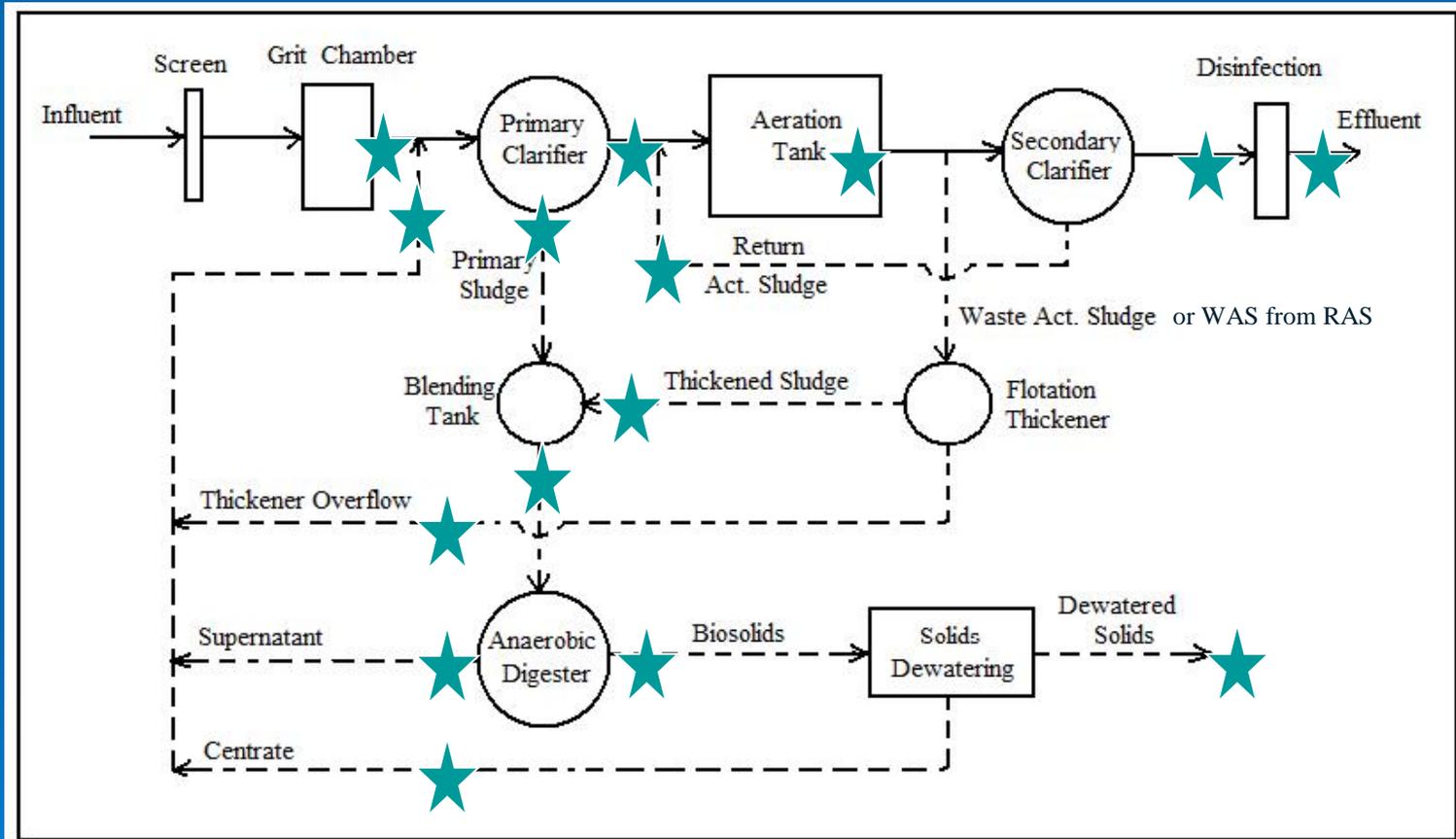


# Process Control Tests for Domestic Wastewater Treatment Facilities



- TCEQ Regulatory Guidance Document: RG-002 (October 2002)
  - Recommended minimum requirements
  - Based on permitted daily average flow and type of treatment
  - Test parameters, sample location and type, and frequency
  - Consult training manuals for solids concentration ranges, amounts of DO, and microscopic examinations of activated sludge

# Typical Activated Sludge Process Flow Diagram – Sample Locations



# Typical Violations of TPDES Permit Conditions

## ➤ Failure to:

- Test, Inspect and Certify backflow devices annually [(30 TAC 290.44(h)(4) ]
- Install and maintain alternative power supply

## ➤ Failure to provide 30-day notification of:

- Introduction of pollutants from a Categorical Industrial User
- Substantial change in volume or character of pollutants being introduced

# Pollutant Change in Character or Volume



# How a Pretreatment Program Approach Can Help Address High WWTP Loadings

Food Processor and Brewery  
Case Studies

The background of the slide is a solid blue color. In the lower right quadrant, there are several faint, concentric white circles that resemble ripples on water, creating a decorative effect.

# Food Processor Case Study

Pretreatment review of the TPDES discharge permit renewal application for “City A” revealed some high loadings to both WWTPs

## WWTP 1

- Design Flow: 0.46 MGD
- Average Flow: 0.30 MGD
- Industrial Flow: 0.05 MGD
- Hydraulic loading: 11% (capacity)
- Hydraulic loading: 17% (actual)

## WWTP 2

- Design Flow: 0.499 MGD
- Average Flow: 0.25 MGD
- Industrial Flow: 0.24 MGD
- Hydraulic loading: 48 % (capacity)
- Hydraulic loading: 94 % (actual)

# Food Processor Case Study

Obtained additional details regarding the industries and types of pretreatment units.

## WWTP 1

- Dairy Products Manufacturer
  - Clarifier

## WWTP 2

- Cheese and Salsa Manufacturer
  - Oil & Grease Separator
- Pet food Manufacturer
  - Oil & Grease Separator
- Dairy Industry
  - Clarifier

# Food Processor Case Study

Summary of maximum and minimum concentrations of the industrial discharges (after pretreatment) to WWTP 2

	Parameter	Max Conc. (mg/L)	Min Conc. (mg/L)
Cheese and Salsa Manufacturer	CBOD5	21,480	985
	TSS	6,690	648
	NH3	64.0	3.47
Pet foods Manufacturer	CBOD5	1,381	287
	TSS	436	192
	NH3	14.2	1.82
Dairy Industry	CBOD5	268	2.54
	TSS	338	8.00
	NH3	9.64	1.05

# Food Processor Case Study

## Summary of Organic (BOD5) Loading from the Industries to WWTP 2

- Organic loading (treatment) capacity: 832 lbs/day
- Total industrial organic loading: ~1,000 lbs/day

	WWTP 2 Organic Loading (lb/day)		
	Max	Min	Average
Cheese and Salsa Manufacturer	985	30	662
Pet food Manufacturer	288	200	253
Dairy Industry	495	4.4	83

# Food Processor Case Study

## Summary of Findings

- No exceedances of TPDES Permit limits at the WWTPs
- Discussed the situation with the City
  - Cheese and Salsa Manufacturer and Pet Foods Manufacturer periodically contributed high organic loading to the WWTP (greater than the treatment capacity)
  - Hydraulic loading from industrial contribution 94% at WWTP 2

# Food Processor Case Study

## Outcome

- Drafted permit that contains language to implement a partial pretreatment program
  - Conduct an industrial waste survey
  - Update ordinance
  - Develop and adopt technically-based local limits for conventional pollutants
  - Develop enforcement response plan and procedures

# Brewery Case Study

- City requested assistance from TCEQ's Small Business and Local Government Assistance Program (SBLGA)
  - Excessive TSS discharge from brewery was allegedly causing pass through and interference
  - Recurring TSS violations and enforcement action
- City's Industrial Waste Ordinance had a limit for BOD but not TSS
  - Brewery installed anaerobic biological treatment: BOD5 <300 mg/L
  - TSS measured downstream of discharge ~ 2,000 mg/L

# Brewery Case Study

- TPDES permit renewal application was subsequently submitted
- Pretreatment worked with the City and SBLGA to address the situation.

## WWTP

- Design Flow: 0.85 MGD
- Average Flow: 0.35 MGD
- Industrial Flow: 0.247 MGD
- Hydraulic loading: 30 %  
(capacity)
- Hydraulic loading: 70 %  
(actual)

# Brewery Case Study

## Outcome

- Drafted permit that contains language to implement a partial pretreatment program
  - Conduct industrial waste survey
  - Update ordinance
  - Develop and adopt technically-based local limits for conventional pollutants and metals
  - Develop enforcement response plan and procedures



# Summary

- Know your permit requirements
  - Meet reporting and notification deadlines
  - Keep detailed and organized records
  - Maintain up-to-date visual or written standard procedures
  - Know your businesses and pollutants and how they impact your WWTP
  - Control businesses and pollutants in order to protect your WWTP
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# Questions?

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