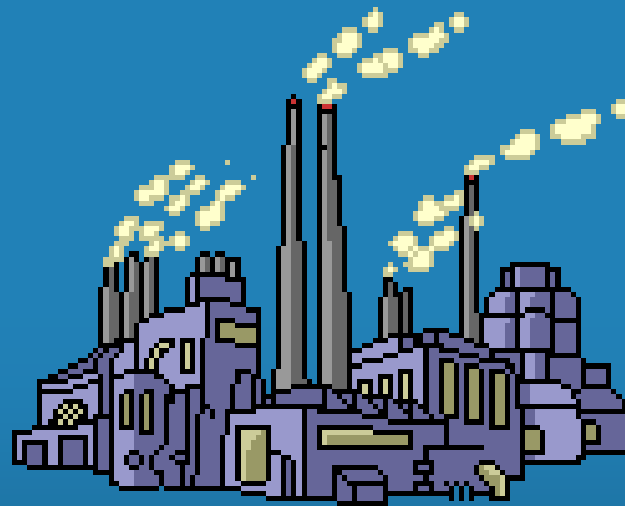


Monitoring Equipment & Pretreatment Systems

Tools for ensuring compliant discharge



Overview

Common Monitoring Systems

- LEL Meters
- pH Monitoring
- Flow Monitoring
- ❖ SCADA systems for monitoring and process control – not as common

Common Pretreatment Systems

- pH Neutralization
- Solids removal/clarification
- Granular Activated Carbon - Adsorption
- Fats, Oil and Grease Removal

What is LEL?

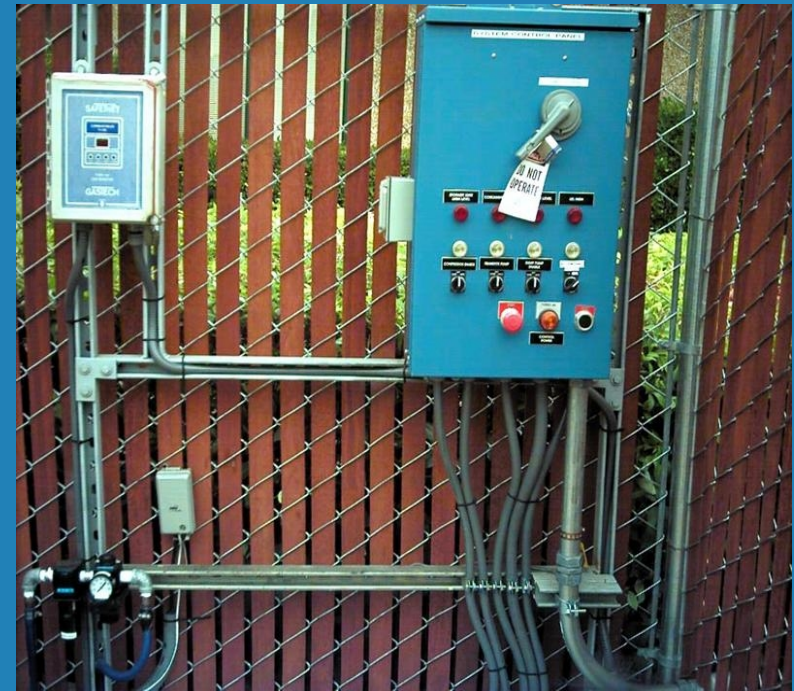
Lower Explosive Limit

“The lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in the presence of an ignition source(arc, flame, heat).”

- District code prohibits discharge of wastewater that results in:
 - Two successive readings of 5% or greater LEL
 - Or one reading of 10% or greater LEL

Continuous Monitoring LEL Meters

- Alarm system
 - Visual
 - Audible
- Automatic shutdown of treatment system
- Maintenance
 - Keep probe dry
 - Calibrate properly



Why The Need

- Protect the Collection System
- Protect the Treatment Plant
- Prevent Pass-Through
- Protect Employees, Public Health and the Environment



1992 – Guadalajara, Mexico. More than 250 fatalities, 5 miles of city streets destroyed – sewer explosions resulting from flammable liquid (gasoline) discharge

What is pH?

A measure of acidity and alkalinity.

- **Central San Local Discharge Limits:**
 - pH of > 5.5 and < 11.5
- **Recommended Set Points to stay in compliance:**
 - pH= 6, pH= 11 (as an example)

pH Monitoring

Continuous pH Monitoring with or without Chart Recorders

- Alarm set points – visual/audible
- Proper Calibration
- Chart paper/pens
- Electrode cleaning/maintenance



Circular Chart Recorder



Strip Chart Recorder

Why The Need

- Protect sewer facilities from corrosion
- To prevent violent/toxic reactions
- Protect Employees, Public Health and the Environment





Flow Monitoring

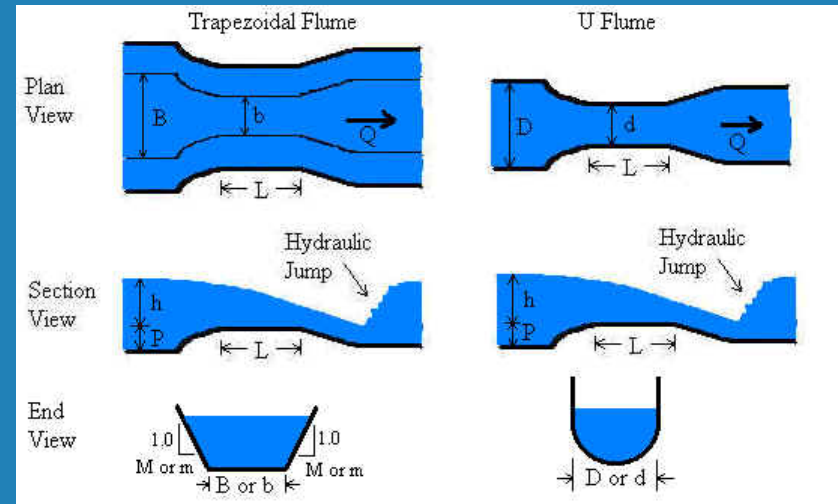
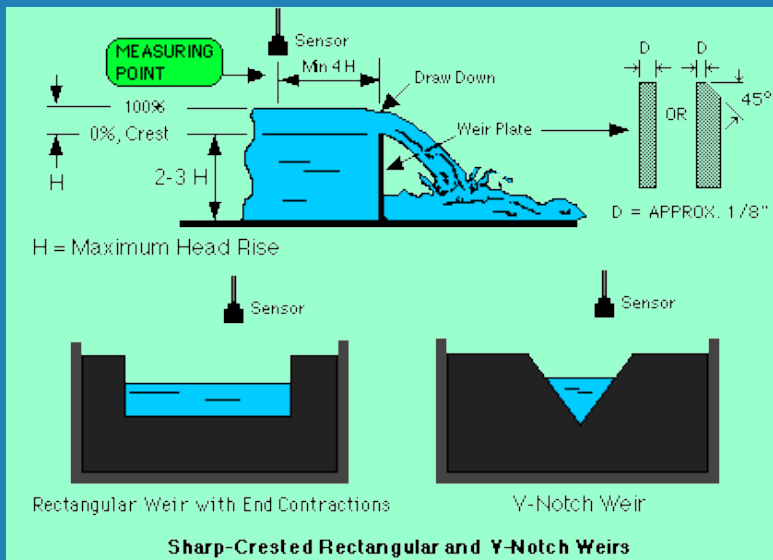
- Determine operation within system capacity
- Sewer Service Fees based on loading
– a function of strength and flow

Flow Meter Devices

Open Channel

Primary Devices

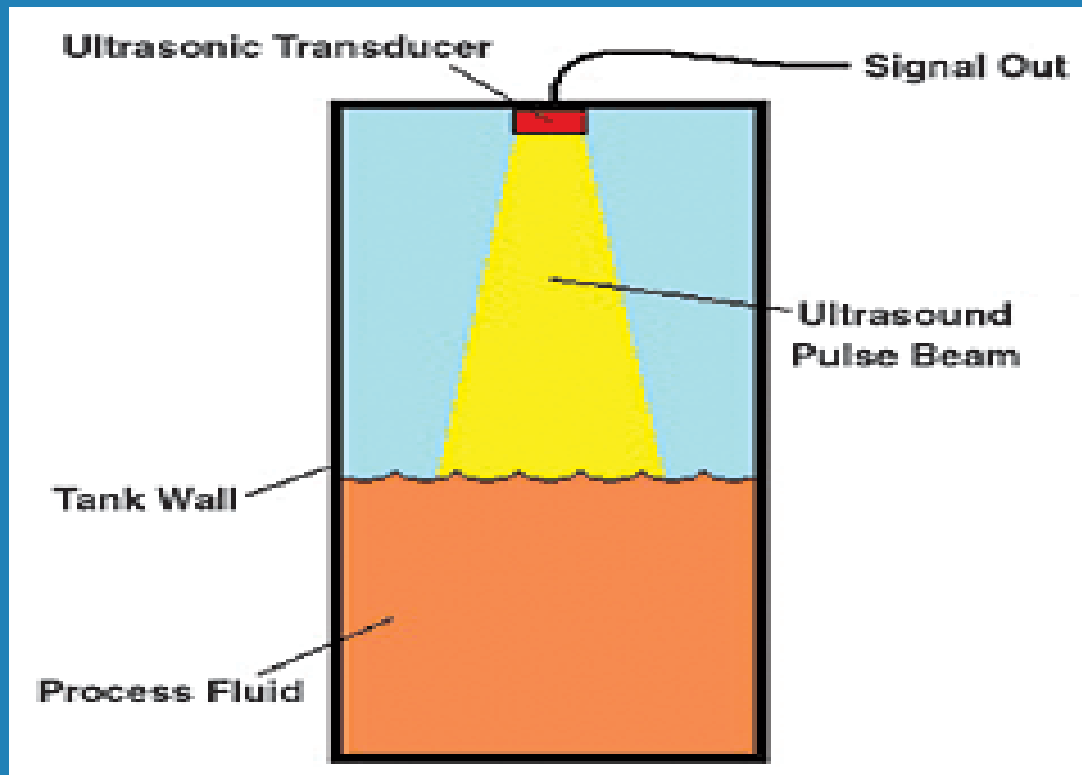
Flumes Weirs



Flow Monitoring

Open Channel Meters

- One example: Ultrasonic



Flow Meter Devices

- **Closed Pipe**
One example:
Propeller/Turbine



Flow Meter Maintenance

- Clean flumes/weirs frequently
- Properly calibrate
- Inspect electrical/sensors
- Software diagnostics
- If device fouled, clean it

Flow Meter Interface with Sampler

- Can connect flow meter to composite sampler
 - Flow Proportional Monitoring
- Calibrate flow meter before using
- Check electrical connections for corrosion



Pretreatment Systems

Wastewater Pretreatment

- Central San's Treatment Plant cannot remove ALL pollutants
 - Pretreatment at the source is more effective
- Must be used in conjunction with Best Management Practices



Wastewater Pretreatment

- Eliminating, reducing or altering pollutants in wastewater before discharging to Central San facilities
- Helps businesses meet Local Discharge Limits and prevent blockages and damage to Central San's facilities

Batch Treatment

Continuous Treatment

Maintenance



Pretreatment

Batch Treatment

- pH neutralization
 - If alkaline, add acid/buffer
 - If acid, add caustic/buffer
- Chemical Deactivation
 - Glutaraldehyde
 - Add Glycine to deactivate

Pretreatment

Continuous Treatment

- Granular Activated Carbon – adsorption
- Fats, Oils & Grease removal
- Solids removal/clarification
- Silver recovery – photo developing
- Mercury amalgam separator – dental industry

Granular Activated Carbon (GAC) - Aqueous Phase

- Treats Hydrocarbons
- Small Volumes of Solvents
- Some Metals
- Groundwater Remediation
- **Maintenance:**
 - Pre-Soak with Fresh Water
 - Monitor For Break -Through Concentrations - replace
 - Rotate Vessels to Maximize Carbon Life (Only With Multiple Vessels in Series)



FATS OILS AND GREASE (FOG)



Animal & Vegetable:

Cooking oil

Animal products – butter, lard, meats, dairy

Hospitals

Food Service/snack bars

Food Manufacturing



Mineral:

Motor Oil

Lubricants

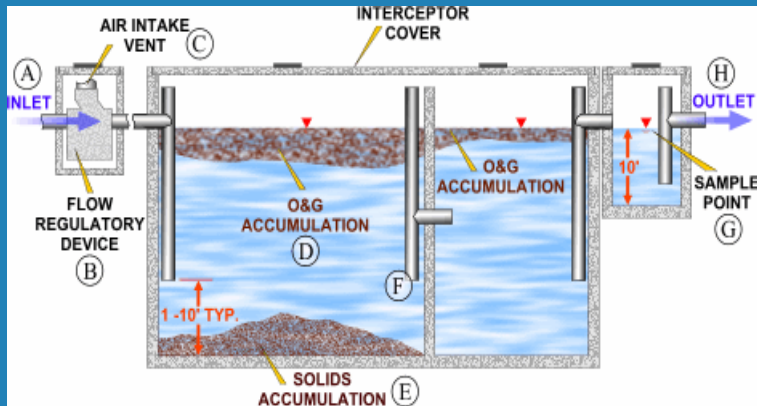
Vehicle Service/Fleet Maintenance

Car Washes

Fleet Maintenance

Grease Removal Devices

- Protect Collection System and prevent overflows
 - Interceptors
 - Traps/separators



Grease Interceptor Operation



Grease Trap

Maintenance

- Grease Removal Devices

- Must be serviced by a licensed and permitted waste hauler at least once every 90 days.
- Decanting of wastes back into an interceptor and other improper cleaning techniques are not allowed. (refer to GI Maintenance Fact Sheet).
- Maintain receipts onsite for 3 years.
- See specific Grease Removal Device information at the following link, click on “For Food Service Facilities”

<https://www.centrialsan.org/post/best-management-practices>

Solids Removal/Clarification

- **Protect Collection System and prevent blockages and overflows**
 - **Screening**
 - **Clarification/gravity settling**
 - tanks, polymers
 - **Filtration**
 - bag, cartridge, membrane, filter media



Monitoring and Pretreatment Equipment Maintenance

- ⇒ Inspection
- ⇒ Preventative Maintenance
- ⇒ Repairs
- ⇒ Replenishment
- ⇒ Calibration
- ⇒ **Don't be afraid to call a technician!**