	NORTH CAROLINA DEPARTMENT OF LABOR	No. 49-2
	OSH DIVISION	Date: 10/2009
	OSHNC INDUSTRIAL DATA REPORT	Pages: 3

Industry: **Sanitary Services**	Sub-Group: **Sewerage Treatment Systems**
SIC: **4952**	NAICS: **221320**

PROCESS DESCRIPTION:

(1) Chemical and sanitary waste system (heavy duty) (Large Municipalities/ Industrial Plants). Waste input is received through sewer lines, entering the waste treatment plant through the parshall flume (meter) if chemical waste of the comminutor (shredder) if sanitary waste. Chemical waste input is measured through the parshall flume before passing through a grit chamber for screening and settling out heavy material. From a grease trap where oil, grease and floating material is collected, it passes into an equalization basin which provides a consistent uniform chemical feed to aeration basins and holding ponds.

Sanitary waste is shredded by the comminutor, passing through an ammoniator which meters the desired amount of ammonia into the streams, across trickling filters which collect fine particles of matter from the waste stream and thence to aeration basins where chemical and sanitary waste systems merge.

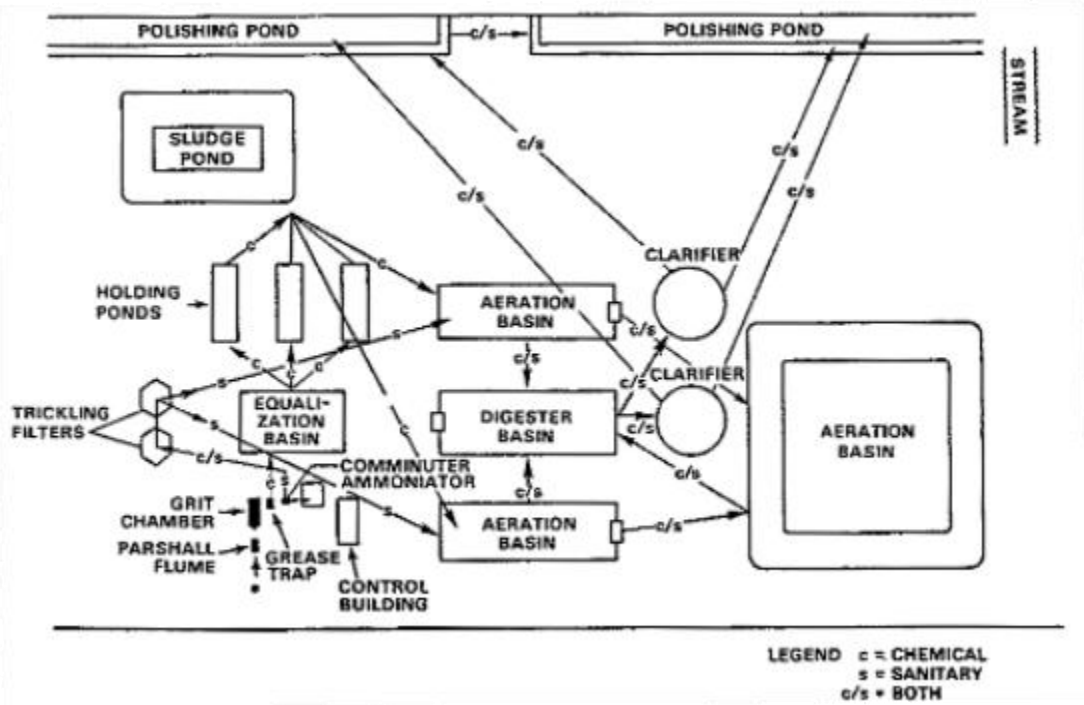
Aeration basins induce seed bacteria into the sewerage and provide the environment where the bacteria can work in digesting wastes and can reproduce. Aeration basins contain aerator motors which keep the contents in a state of violent agitation thus providing necessary oxygen to the bacteria (oxidation).

The waste stream passes from aeration basins to the digester basin, where sludge is broken down into simple compounds and rendered partially inert. Further oxidation takes place within the digester basin before passing through clarifiers where the sludge is settled from the waste water and deposited into a sludge pond (inert) and allowed to settle out. The clarifiers also supply the aeration and digester basins with activated sludge (seed bacteria) for infusion into the waste stream. From the clarifiers, the waste water is distributed to polishing ponds where the final treatment is accomplished by the use of algae growth. Finally, the treated and inert waste is dumped into a public stream for dispersion away from the treatment facility.

(2) Sanitary Waste system only (light duty) (Realty developments, small municipalities). The primary differences between the heavy and light duty sewerage treatment plant are (a) equipment (facilities) utilized and (b) size (the process is very similar). Light systems are normally self-contained and generally consist of an elevated or sub-surface tank containing separate chambers in which the treatment process occurs. Process of shredding, aeration, digestion and clarification occur within the tank and the waste water is then carried away by dumping into a stream of through a piping system. Both processes are highly automated and are governed by instruments located in a control facility where testing and sampling is also accomplished.

NORTH CAROLINA DEPARTMENT OF LABOR	No. 49-2
OSH DIVISION	Date: 10/2009
OSHNC INDUSTRIAL DATA REPORT	Pages: 3

PROCESS FLOW:



Hazards Analysis

Major Hazards			Other Hazards		
Location	**Item**	**Hazard**	**Location**	**Item**	**Hazard**
Control building	Chemicals, caustics	Skin and eye irritations and burns	Control building walkways	Housekeeping	Slips, trips and falls
Throughout	Power transmission apparatus	Amputation and crushed limbs	Control building	Improper storage of oxygen, fuel chemicals	Fire, explosion
	Electrical installations	Fire; electrical shocks	Other	Chlorine tank storage	Eye, respiratory irritation, inhalation, release
	Pits, ponds, basins	Falling injuries; drowning			
Outside area	Wet and slippery walkways	Falling injuries	Shop	Welding	Inhalation, eye injuries

Key OSHNC Standards

Reference	29 CFR 1910 — General Industry Standards
Subpart D	Walking and working surfaces
Subpart E	Means of egress
Subpart I	Personal protective equipment
Subpart O	Machinery and machine guarding
1910.119	Process safety management
1910.120	Hazardous waste operations and emergency response
1910.146	Permit-required confined space entry
1910.147	Control of hazardous energy (lock-out/tag-out)
1910.151	Eyewash and emergency showers
1910.242	Hand and portable power tools, general
1910.243	Portable power tools guarded
1910.1000	Air contaminants
1910.1200	Hazard communication

Inspection Analysis

The inspection should begin inside the control building. Observe all power-transmission apparatus for proper guarding, electrical equipment for proper installation and grounding, housekeeping, protective equipment for handling of chemicals and corrosives and any unsafe employee action. Also inspect adjoining or separate storage areas for proper handling of oxygen-fuel gas and chemicals. Check for use and quantity of Chlorine cylinders for applicability of process safety management and HAZMAT emergency response activities.

For the large facility the next inspection area would be along the intake and process flow noting covers and/or railings for pits and standard railings and toeboards for walkways over ponds and basins (wet slippery surfaces occur over agitated bodies of water). Electrical installations (grounding of motors and equipment), especially in wet areas and guarding of belt and chain drives and shafting must be observed along with installation and use of fixed stairs and ladders, portable ladders and walkways and platforms. Note the use of welding apparatus (repairs) and portable hand tools guarding, grounding and usage. Observe and interview employees to ascertain if safe work practices are followed.

For small facilities (self-contained) the next inspection area would be along the ground level around the periphery of sub-surface tanks or atop elevated tanks. In addition to the areas listed for large facilities be especially watchful for plant-installed walkways which are often added to facilities as means of egress to working areas and/or process chambers of the tank system.

Other Pertinent Comments: