



The treatment of sewage involves the systematic removal or conversion of the harmful constituents present in the sewage. A typical and logical sequence of wastewater treatment processes are as follows:

Preliminary Treatment

Materials such as rags, plastics, sand, metal particles, etc. are transported through the sewers with the wastewater. Although only a small proportion of the total wastewater flow, it can have adverse effects on further treatment processes and can cause damage to plant equipment and must be removed. Preliminary treatment of wastewater occurs at the head of the works and generally includes screening, grit removal and flow measurement.

Primary Treatment

Organic and inorganic solids are removed by sedimentation, and floatable material are removed by skimming. Typically, a BOD reduction of 25% to 50% is achieved and 50% to 70% of the SS (suspended solids), and 65% of the oil and grease are removed. "A primary sedimentation tank is defined as a tank in which wastewater is retained long enough to bring about sedimentation of suspended matter but short enough to prevent anaerobic decomposition of the sludge."

Secondary Treatment




"Secondary treatment is the second step in most waste treatment systems during which bacteria consume the organic parts of the wastes. This is accomplished by bringing the sewage, bacteria and oxygen together in trickling filters or within an activated sludge process." (Ref.2). Micro-organisms and oxygen are utilized during secondary treatment to stabilize the sewage after primary treatment and 85% to 95% of the SS and the BOD load can typically be removed. Secondary treatment processes include percolating filters (trickling filters or rotating biological filters), rotating biological contractors, and activated sludge processes, which normally consist of aeration tanks (where air (oxygen) is injected into the primary treated wastewater), sedimentation tanks (where the activated sludge is separated from the liquid) and final clarifiers.

Tertiary Treatment

"Tertiary treatment is the advanced treatment process, following secondary treatment of waste water, that produces high-quality water. Tertiary treatment includes removal of nutrients such as phosphorus and nitrogen and practically all suspended and organic matter from waste water." During tertiary treatment (which includes filtration, phosphorus removal, ammonia stripping and other special treatments), specific constituents are removed. Further treatment may include sand filtration, wetlands or other advanced treatment processes.

Disinfection

Methods for disinfection are:

-  Chemical, e.g. chlorination and ozonation
-  Physical, e.g. ultraviolet radiation and microfiltration
-  Biological, e.g. detention ponds

