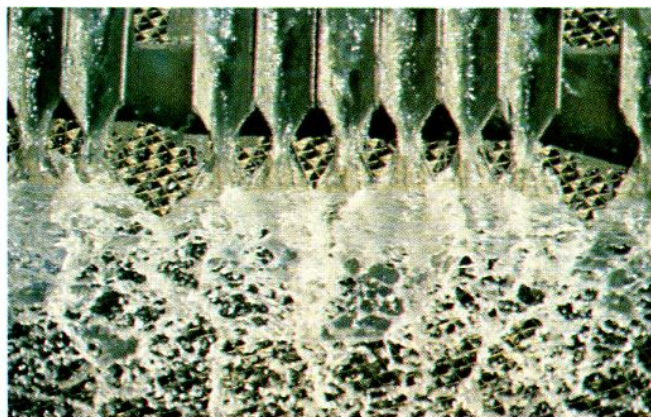


THIS IS THE WAY WE T

The sewage treatment plant at Sjölanda began operating in 1963. It was upgraded in 1970 and again in 1980. It comprises three stages, one for mechanical treatment, one for biological treatment and one for chemical treatment. Excess sludge goes to a separate department for treatment by thickening, digestion and dewatering. All operations are controlled and monitored automatically using computers.

Incoming sewage

The Sjölanda plant serves most of the city of Malmö as well as some municipalities to the north and east. The wastewater from the big food industry Foodia in Stafanstorps also arrives for treatment. Sewage is pumped to the plant by about 70 pumping stations of varying sizes. The plants is large enough to purify thoroughly up to 4 400 liters of sewage per second.



FIRST STAGE: MECHANICAL TREATMENT

Mechanically cleaned bar racks

The first step is to pass the wastewater through racks which are mechanically cleaned. Coarse solids are removed and transported to containers by belt conveyors. Screenings are dewatered in hydraulic presses before going to a land fill.

Grit removal

Aerated grit chambers remove grit consisting of sand, gravel and other solids substantially denser than the organic putrescible solids in wastewater. Travelling-bridge scrapers remove the grit into hoppers. It is then pumped to a screw conveyor for dewatering before going to a land fill.

Pre-aeration

In the pre-aeration basins the wastewater is aerated to prevent the formation of hydrogen sulphide, for example. Oil, fats and petrol rise to the surface and are skimmed off.

Primary sedimentation

In the primary sedimentation basins, particles heavier than water sink to the bottom. The sediment is called sludge and travelling-bridge scrapers transport it into hoppers. It is then pumped to the sludge treatment department.

SECOND STAGE: BIOLOGICAL TREATMENT

Biological treatment means that colloidal and dissolved organic matter is decomposed by micro-organisms, mainly bacteria. The Sjölanda plant uses two methods in parallel. Just over half of the sewage is treated in trickling filters and the rest in an activated sludge system.

Trickling filters

Each trickling filter is a large round tank packed with polyvinyl chloride plastic sheets having a large specific surface and a high void ratio. The sewage is spread out over each filter by a rotating distributor at the top. The filter decompose the organic matter at a high rate and are followed by sedimentation basins. When the hydraulic load is too small, filter effluent or effluent from the sedimentation basins is recirculated through the filters. The trickling-filter sludge is treated in the sludge treatment department.

Activated sludge system

The activated sludge system comprises aeration basins and sedimentation basins. The aeration basins contain a sludge consisting of micro-organisms. The sludge is aerated. This supplies the process with the oxygen needed for the decomposition of the organic impurities. It also agitates the sludge properly. The method requires a definite concentration of sludge. This is maintained by recycling most of the activated sludge removed as sediment from the settling basins. Only a small part of the sludge is drawn off as excess activated sludge. It is re-aerated and mixed with the influent wastewater just ahead of the pre-aeration basins.

THIRD STAGE: CHEMICAL TREATMENT

This stage removes substances like phosphorus by chemical precipitation, using alum or ferric chloride. The chemical is mixed with the wastewater by vigorous agitation.

Flocculation

After the chemical is added, the flocculation begins. Floc growth is promoted by gentle stirring with slow paddles. After flocculation, the flocs are large enough for removal in the floc separation unit.

Flotation

The flocs are removed in flotation tanks, using dissolved air flotation. Part of the effluent wastewater is recirculated. It is pumped into a tank where air is dissolved in the water under pressure. Reducing the pressure liberates the dissolved air as tiny air bubbles. The bubbles either adhere to the flocs or are trapped in them. The buoyant floc particles then rise and form a sludge at the surface of the flotation tanks. The sludge is scraped off and pumped to the storage tank for chemical sludge.

Pumphouse and outlet

The effluent wastewater is pumped into the Sound (Öresund) via an underwater culvert three kilometers long. Average retention time in the plant is between ten and fourteen hours.