

Biological Wastewater Treatment

Industrial Park “Schwarze Pumpe” in Spremberg Germany

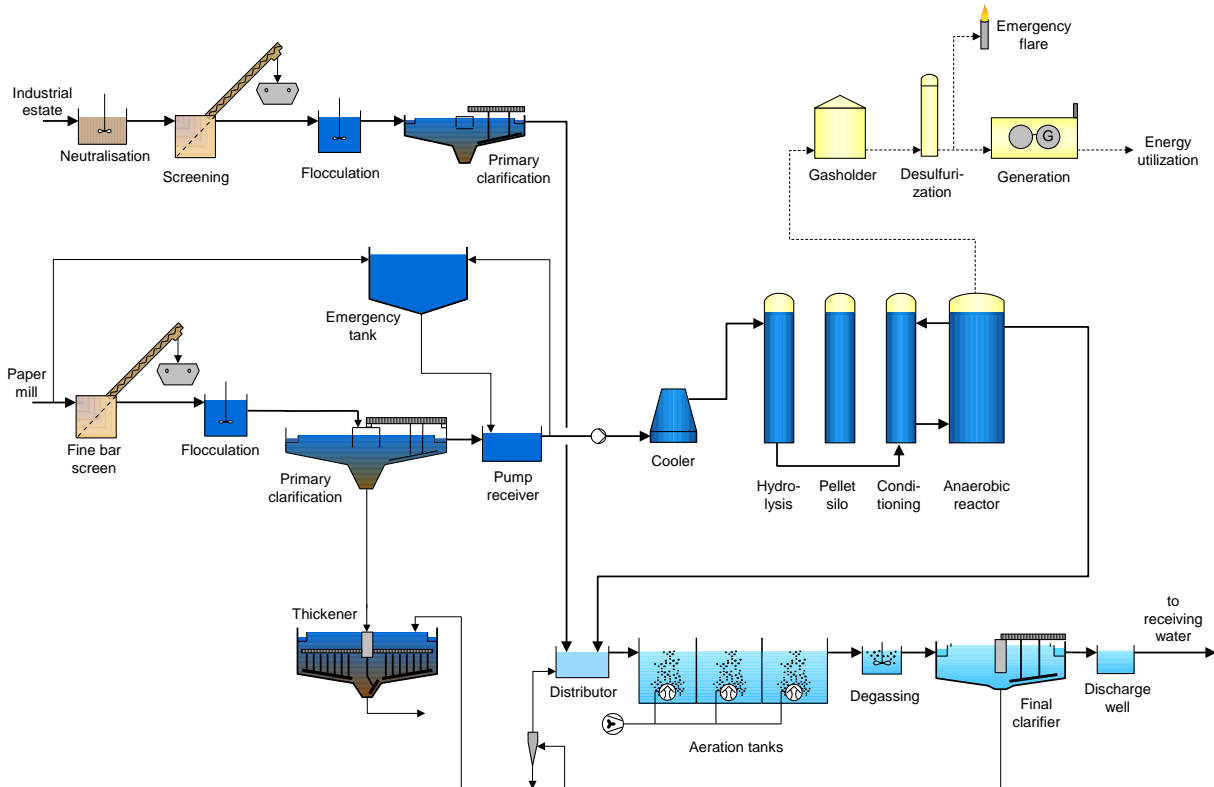


In July 2003 BAMAG has received a turnkey order for the supply of a new wastewater treatment plant for the industrial park „Schwarze Pumpe“ in Spremberg, located near Cottbus, Germany. The contract value is approx. € 11 Million. The effluents from a paper mill as well as the industrial and sanitary waste water of the industrial park will be purified in this plant. The key plant components comprise the pre-clarification, the anaerobic and aerobic treatment as well as the final clarification. The biogas will be treated in a combined heat and power unit.

Furthermore BAMAG has received a contract for the operation & maintenance of the wastewater treatment plant for the first 10 years.

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... the experts



1. Objective

Construction of a turnkey wastewater plant for treatment of effluents from waste paper processing and industrial park, including plant operating management.

Design data

Paper mill

Wastewater flow 6,240 m³/d
COD 32,000 kg/d

Industrial park

Wastewater flow 1,085 m³/d
COD 1,150 kg/d

Treatment target Direct discharge

2. Plant concept

Paper mill production effluent

Mechanical pretreatment

- Fine bar screening
- Flocculation
- Primary clarification
- Cooling

Biological pretreatment

- Anaerobic treatment

Industrial estate effluents

Mechanical pretreatment

- Neutralisation
- Fine bar screening
- Flocculation
- Primary clarification

Final treatment, combined effluents

- Three-stage cascade aeration
- Final clarification

Biogas treatment and utilisation

- Gasholder
- Desulphurisation
- Local steam and power generation

Sludge treatment

- Thickening

Operating building /

Chemical storage

Production effluent from the paper mill is treated by fine bar screening, flocculation and primary clarification (two streams) to remove solids, then cooled and routed to the anaerobic treatment stage and supplemented with nutrients.

The purpose of the anaerobic treatment stage is economical reduction of COD while generating biogas. Anaerobic pre-treatment takes place in three reactors using biomass pellets. Separation of the gas-water-pellet mixture is accomplished by an integrated separator system. The biogas recovered is biologically desulphurised for use as fuel in a steam and power generating plant supplying electricity and heating to local consumers. Waste heat is dissipated through air coolers. Wastewater from the industrial park is neutralised and cleaned of solids by fine bar screening, flocculation and primary clarification, then combined with the pre-treated production effluent for feeding to the aeration system. It is supplemented with nutrients as required.

Final treatment takes place in a three-stage cascade aerator with final clarification tank (two streams) to produce effluent of a grade suitable for direct discharge to the river. Tendency of the wastewater to heavy calcium carbonate precipitation requires use of an appropriate aeration system and a calcium carbonate removal unit to stabilise the activated sludge process.

Sludge from primary clarification of the production effluent, biological

excess sludge and lime sludge is sent to a thickener and subsequently to disposal.

In the occurrence of any unforeseen operating state, the water can be stored temporarily in an emergency collection tank.

3. Features

- High process stability due to designed-in flexibility
- High operational safety due to redundancy and reserve capacity of treatment process
- Greatly reduced sludge accumulation due to anaerobic pretreatment
- Improved economy due to biogas utilisation and steam and power generation
- Small space requirement
- Short time for construction
- Optimised operation through plant management by Bamag

4. Dates

Contract award	2003
Construction start	2004
Start-up	2005