Biological Wastewater Treatment

ARA Nordhorn
Bamag AQUATOR® Biofiltration Technology

The wastewater treatment plant operated by the Municipality of Nordhorn, Germany treats municipal wastewater in conjunction with industrial effluents from the local textile industry. To meet the tightened effluent discharge standards, the existing sewage treatment plant has been optimised and complemented with a fixed-bed bio-reactor and bio-filtration system based on the AQUATOR® process.

Bamag is an international EPC contractor for water and wastewater treatment plants as well as thermal processes. We design, supply and operate your plant. We are...

... the experts
Nitrate conversion to elemental nitrogen is accomplished in the subsequent denitrification filters using methanol as an external carbon source. At the same time, residual solids contained in the waste water are removed. The waste activated sludge from biological treatment is subjected to aerobic stabilisation before being routed to landfarming.

3. Characteristic plant data

Existing plant
- 1 Cyclator®
  Ø 34 m
  Clarification area 840 m²
  Depth of water 3.7 m
- Partial denitrification
  Volume 650 m³/tank
  Solids loading 2 kg DS/m³
  Submerged motor agitators
- Aeration tanks
  Volume 2,000 m³/tank
  Solids loading 2 kg DS/m³
  Space loading 2 kg BOD₅/m³
  Gyrox surface aerators
- Intermediate clarifiers
  Clarification area 750 m²/tank
  Depth of water 2 m
- Aeration tanks
  Volume 3,000 m³/tank
  Space loading 0.4 kg BOD₅/m³
  Fine-bubble diffused aeration
- Secondary clarifiers
  Clarification area 1,200 m²/tank
  Depth of water 2 m

- 2 pre-treatment tanks for industrial effluents
  Volume 5,000 m³/tank
  Depth of water 4 m
  Submerged motor agitators
- O₂ depletion tank
  Volume 700 m³
  Depth of water 2.4 m
  Submerged motor agitators

Extension
- 8 fixed-bed nitrification reactors, upflow mode
  Area 35 m²/reactor
  Q max 1,900 m³/h
  Nozzleless filter bottom (M blocks)
- 8 denitrification filters, downflow mode
  Area 22.5 m²/filter
  Q max 1,400 m³/h
  Nozzleless filter tray (M blocks)
  Dosing equipment.

4. Operating experience
The extended plant was put on stream in 1997.
After only a short running-in period, the guaranteed effluent discharge levels were clearly outperformed.
Stepwise optimisation of the existing plant will result in a further improvement in the effluent quality attainable.