Municipal wastewater

Challenge
Due to more stringent international and governmental legislation, in terms of wastewater discharge consents, the disposal cost of municipal wastewater is increasing. In addition to this, the abstraction of ground water is being limited to prevent a dehydration of the soil which has a destructive influence on nature's flora and fauna. With these factors in mind the need for a closed water cycle is increasing rapidly. For efficient wastewater treatment, the Membrane Bio-Reactor (MBR) has been developed.

Solution
The Norit Airlift™ MBR is a compact-built purification system combining the biological degradation step with a membrane separation step. This combination offers several significant advantages over a conventional activated sludge system, such as a higher biomass concentration and less sludge carry-over. The higher biomass concentration results in a more compact system. The decrease in sludge carry-over reduces the need of post-treatment of the effluent. The Norit Airlift™ MBR configuration offers an ultrafiltration (UF) membrane solution placed outside the reactor allowing the maintenance of the plant to be simple and clean. The side stream set-up also allows easy expansion of existing WWTP. Energy consumption is at the same level of submerged membranes or even less, due to the efficient usage of process conditions for flux enhancement.

Norit X-Flow's tubular 5 mm UF membrane will allow a bioreactor to run up to 15 g/l MLSS biomass. Norit X-Flow's 5 mm membranes found their way in MBR applications in the municipal market.

The Norit X-Flow membrane modules are being produced with ISO 9000 certification.
**Norit Airlift™ MBR**

**Features and benefits**

- Membrane placement: Outside bioreactor
- Permeate quality: True ultrafiltration
- Turbidity: < 0.1 NTU
- SdI: < 3
- Maintenance & cleaning: Accessible & clean environment, Fully automated cleanings, Use of low cost chemicals
- Airlift filtration: Low energy: < 0.25 kWh/m³
- Fully automated operation: Logging of operating parameters
- Atmospheric system: Fully enclosed, No operator exposure to fumes or aerosols
- Simple layout
- High flux rates
- Low TMP
- Small footprint

**Examples**

Norit X-Flow provides membranes for MBRs for a growing number of plants worldwide. Capacity ranges from less than 240 m³/day (0.06 MGD) to more than 17,000 m³/day (4.5 MGD).

**Grand Traverse – USA**
- WWTP
- Capacity: 380 m³/day (0.1 MGD)
- Year of start up: 2004
- Technology: Norit Airlift™ MBR

**Ootmarsum – The Netherlands**
- WWTP
- Capacity: 3,600 m³/day (0.95 MGD)
- Year of start up: 2006/2007
- Technology: Norit Airlift™ MBR

**Xuzhou – China**
- Cigarette factory
- Capacity: 2,000 m³/day (0.52 MGD)
- Year of start up: 2006
- Technology: Norit Airlift™ MBR

**Millsborough – USA**
- WWTP
- Capacity: 4,200 m³/day (1.1 MGD)
- Year of start up: 2007
- Technology: Norit Airlift™ MBR

**Frisian Water Alliance – The Netherlands**
- De-central WWTP
- Capacity: 75 m³/day (0.02 MGD)
- Year of start up: 2007
- Technology: Norit Airlift™ MBR

Norit Membrane Technology BV reserves the right to make changes in the technical specifications at any time.