Constructed wetlands, stormwater treatment and sludge composting by reed beds at sewage treatment plant Lahstedt-Gadenstedt, Germany

Owner:
Municipality Lahstedt
Am Breiten Tor 1
D-31246 Lahstedt, Germany

Optimization of a trickling filter
for domestic sewage treatment
with planted artificial wetlands

Population equivalent:
3000 PE in Gadenstedt

Planning: 1995-1996
Construction: 1997-1998

Presented as registered project of world exhibition
Expo 2000 Hannover

Wastewater treatment plant from 1959:
- trickling filter

Structural alteration measure:
- new grit chamber and screen

Enhancement of the old trickling filter:
- 4 reed planted artificial wetlands
- 3 reed planted sludge drying beds
- stormwater treatment system

Space requirement for artificial wetlands:
10.000 m²
Design parameters:
500 m³/d (dry weather) – 2000 m³/d
(stormwater)

Space requirement for storm water treatment:
- 17.000 m² with green areas around
Design parameters:
123.000 m³/a and 19.250 kg COD/a from
38,5 hectare paved area

Special features:
- successful operation
  of the artificial wetland
  as secondary
  treatment step
  (shutdown of trickling
  filter, see results
  on the next page)

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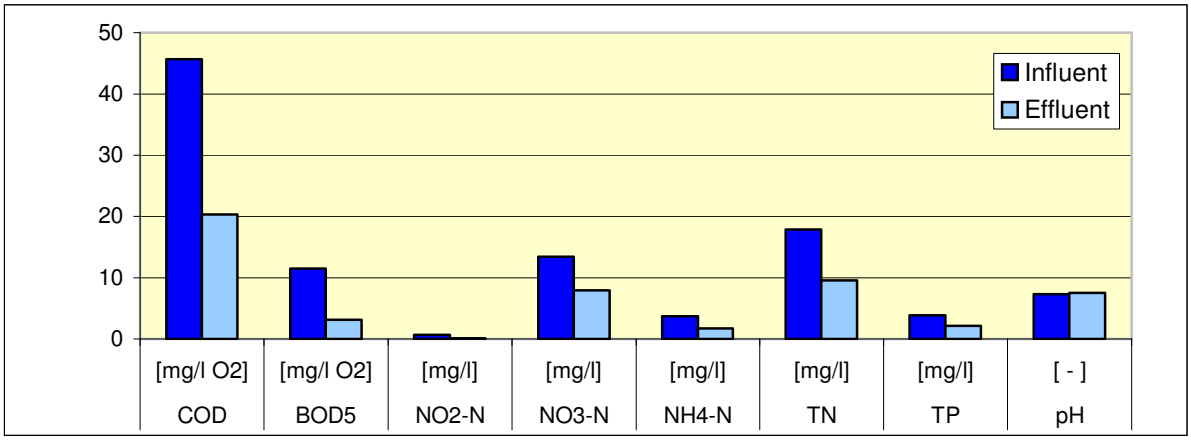
Performance of the reed bed treatment system in Lahstedt-Gadenstedt

Tertiary treatment of trickling filter effluent

July 1998 - November 2001

Primary/secondary treatment: fine screen, aerated grit chamber, primary sedimentation, trickling filter

Mean values	COD [mg/l O2]	BOD_5 [mg/l O2]	NO_2-N [mg/l]	NO_3-N [mg/l]	NH_4-N [mg/l]	TN [mg/l]	TP [mg/l]	pH [-]	n *
Influent	46	11	0,6	13,4	3,7	17,8	3,9	7,3	159
Effluent	20	3	0,1	8,0	1,7	9,6	2,1	7,5	150



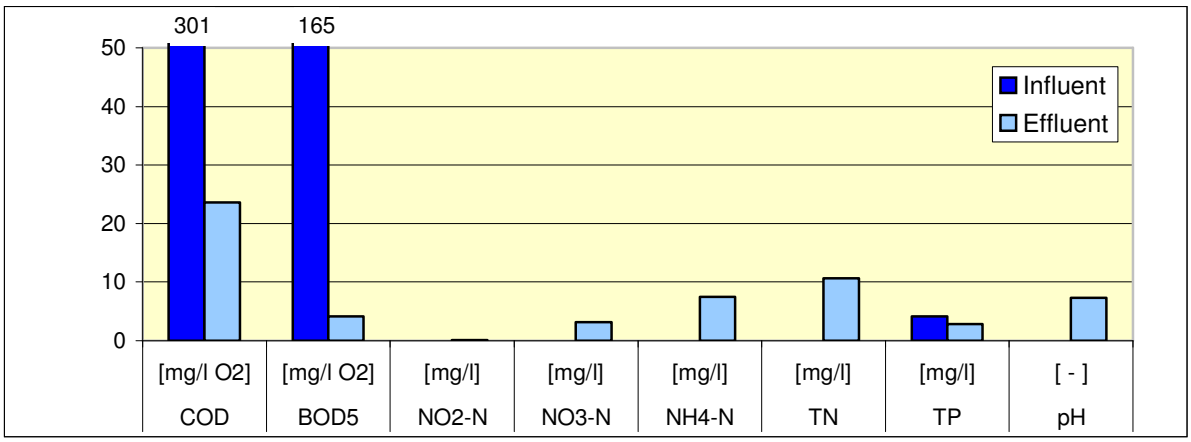
Average hydraulic loading rate: 142 l/m²xd Table 1

Secondary treatment of municipal wastewater

December 2001 - April 2002

Primary treatment: fine screen, aerated grit chamber, primary sedimentation

Mean values	COD [mg/l O_2]	BOD_5 [mg/l O_2]	NO_2-N [mg/l]	NO_3-N [mg/l]	NH_4-N [mg/l]	TN [mg/l]	TP [mg/l]	pH [-]	n
Influent	301	165	----	----	----	----	4,1	----	19
Effluent	24	4	0,1	3,1	7,5	10,7	2,9	7,3	19



Average hydraulic loading rate: 137 l/m²xd Table 2

n * = number of samples

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