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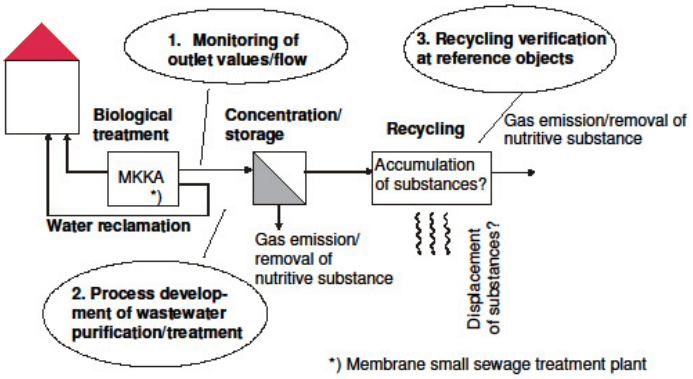
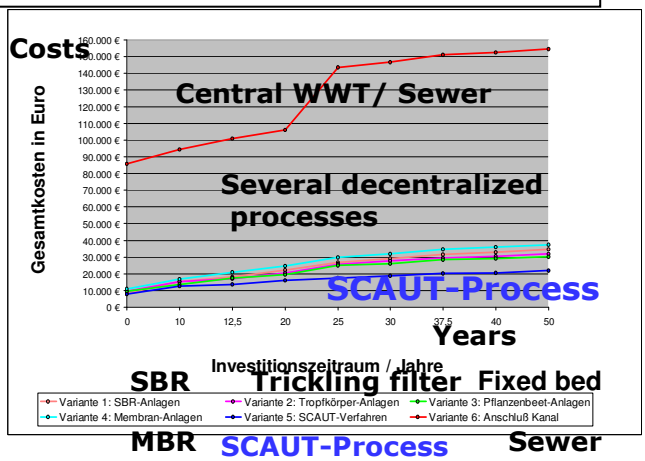
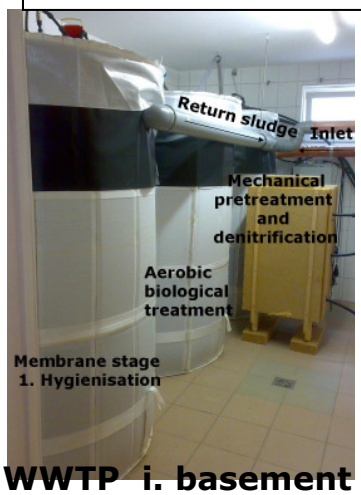
DEVELOPMENT AND LARGE SCALE TESTING OF WATER REUSE PROCESS TECHNOLOGIES IN WASTE WATER FREE HOUSES AND COMPANIES BASED ON ULTRAFILTRATION MEMBRANES



Focus of research in the Waste-water-free Properties Project



This paper presents the successful use of state-of-the-art membrane filtration and basic biological processes. This advanced treatment of organic matter containing waste water is used for the production of water fit for human consumption. The reuse of water within households, hotels or food production plants requires save and efficient treatment of waste water to meet drinking water regulations. In order to apply the process all around the world it has to be easy to handle whilst meeting the requirements of health and safety regulations. The installations can therefore be deployed without machinery.



WWTP i. basement 10 p.e. + 3,000 l/d

	SBR plant	Trickle filter plant	Planted bed system	Membrane plant	SCAUT process	Sewer Treatment plant size 4
Waste water parameters						
COD [mg/l]	< 90	< 150	<150	< 90	< 5	< 90 (<40)
BOD [mg/l]	< 25	< 40	< 40	< 25	< 5	< 20 (< 8)
Ammonium [mg/l]	< 10	(< 10)	(< 10)	< 10	< 2	< 10 (2-3)
N_{inorg} [mg/l]	(< 25)			(< 25)	(< 6)	< 18 (< 1)
P_{total} [mg/l]	(< 2)	(< 2)		(< 2)	(< 0.02)	< 2 (< 1)
Faecal coli form germs in 100 ml	> 1 million (< 100)	> 1 million	> 1 million	< 100	0.0	> 1 million
Filterable substances	50.0	75.0	75.0	0	0	< 20
Bacteriological potable water parameters						
Coliform bacteria in 100 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
E. coli in 100 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Enterococci in 100 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Colony count 20² C in 1 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Colony count 36² C in 1 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Clostridium perfrigens (including spores) in 100 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Pseudomonas aeruginosa in 100 ml	not achievable	not achievable	not achievable	not achievable	0	not achievable
Salmonella spp.	not achievable	not achievable	not achievable	not achievable	0	not achievable

Purification quality as a function of the process

Water recycling, Romania

Water recycling from sanitation and production wastewater

Thus, there are simple solutions for many production facilities as well as for many households in arid regions. The latter may also be the case in both permafrost and arid regions. In both cases, there are also considerable energy-related advantages (use of solar power, recycling warm water into excellent quality for human consumption, etc.).

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