Bank filtration + Nanofiltration

Miehe U., Zietzschmann F. (KWB), Vredenbregt L. (Pentair),
Sperlich A., Gnirß R. (BWB)

Approach

Bank filtration as natural pre-treatment for capillary nanofiltration. Single anoxic and suboxic wells of a drinking water works will be treated decentralized in a pilot at Tiefwerder, Berlin.

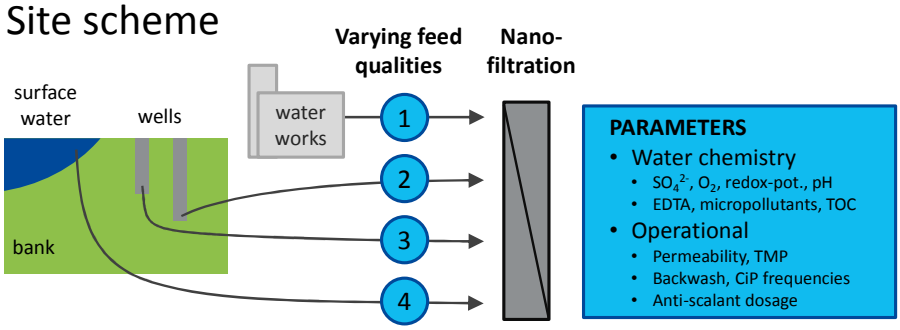
Aims

Targeted pollutant removal at specific wells
- SO_4^{2-}
- EDTA
- Micropollutants

Compare different feed water qualities
- Redox potential
- Fe(II) & Mn(II) concentration
- TOC/ DOC, biopolymers
- Scaling & fouling propensity

Demonstrate potential economic benefits
- Long-term process stability
- Impact of treated volumes
- Pumping efforts
- Membrane cleaning & replacement

Site scheme



Estimated water characteristics & scaling/ fouling potentials

	Fe(II) & Mn(II)	redox state	scaling potential	fouling potential
1 finished drinking water	very low	oxic	low	low
2 groundwater / deep bank fil.	high	anoxic	medium ?	low
3 shallow bank filtrate	medium	suboxic	high	low
4 surface water	low	oxic	low	high

Bank filtration

Removal of
- TOC/ DOC
- Biopolymers (reduction of membrane fouling)
- Micropollutants (depending on compound & travel time)
- Algae, particles & pathogens

Advantages
- Robust system with low risk of failure

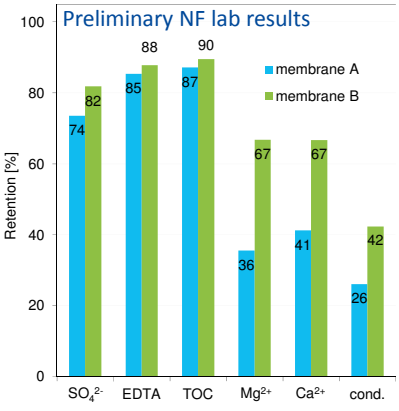
Disadvantages
- Dissolution of iron & manganese
- No SO_4^{2-} removal

Capillary nanofiltration

Removal of
- SO_4^{2-}, hardness
- TOC/ DOC
- Micropollutants (depending on size & charge)
- Pathogens

Advantages
- Suitable for backwash & flushing

Disadvantages
- Scaling potential by iron & manganese
- High energy demand



AquaNES

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