New pre-treatment Andijk

Pumping station Andijk (PWN)

Drinking Water Treatment 2 | CT5520

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Choice final process scheme

Design criteria:

new pre-treatment with enhanced DOC and Nitrate removal

Selected treatment DOC removal: MIEX

Innovative treatment step with high DOC removal efficiency

For MIEX no pre-treatment is necessary. The whole process works more efficient with less DOC. Therefore MIEX will be the first treatment step.

Choice final process scheme

DOC is removed; particles still have to be removed

choice: RSF or Ultrafiltration
Selected treatment: Ultrafiltration

innovative and multiple barrier

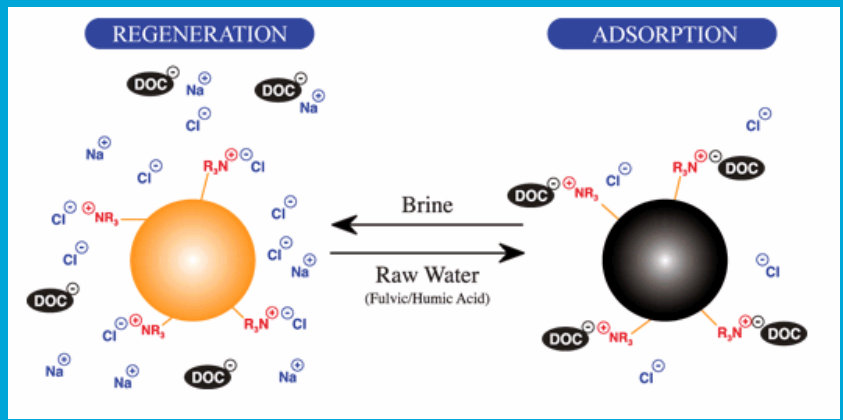
Final process scheme:

reservoir > micro seeves > MIEX > UF > UV/H202 > ACF

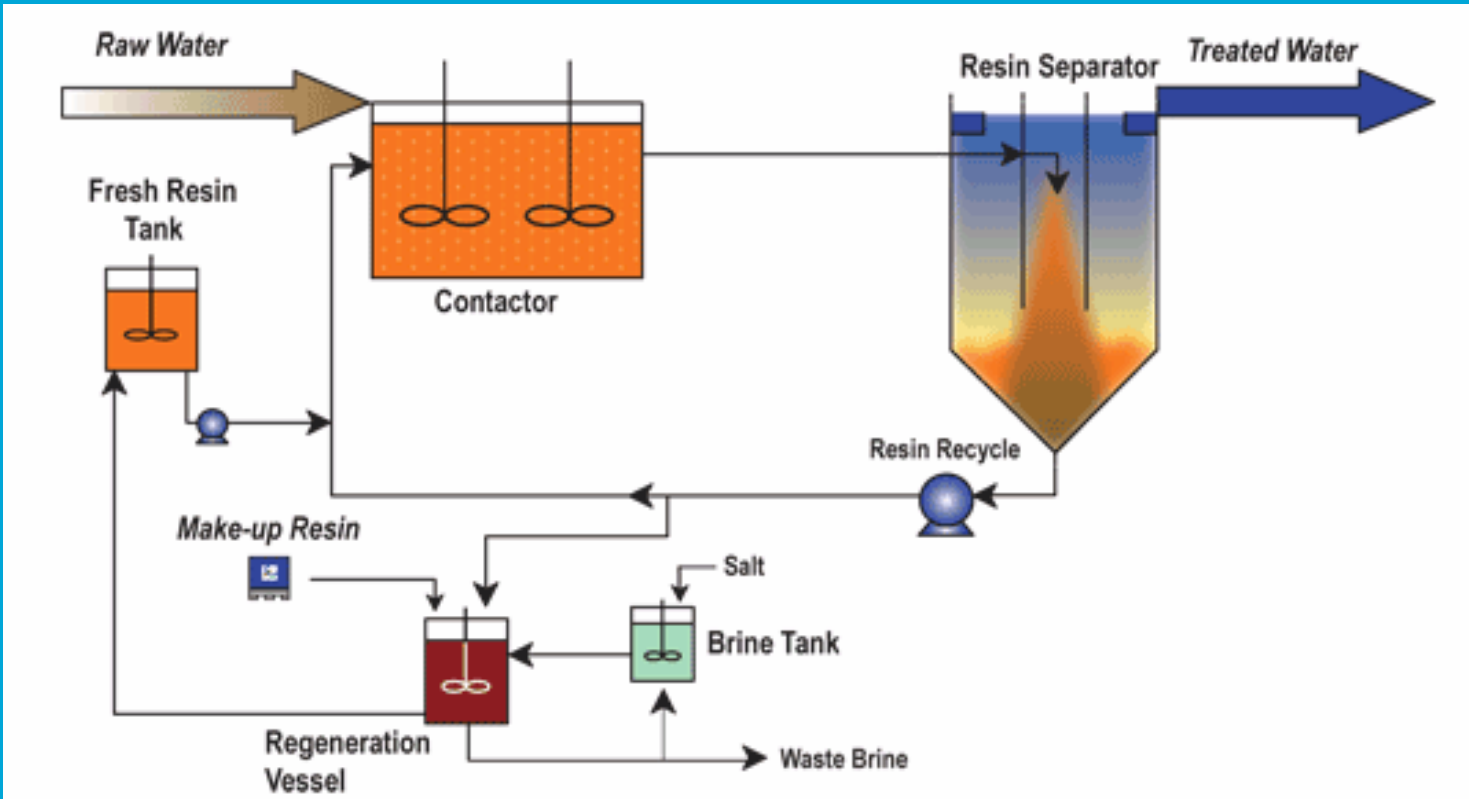
MIEX ion exchange

- Resin is mixed with raw water containing the negatively charged target anions (DOC), which exchange for chloride ions on the resin's active sites in a process referred to as "adsorption."

- When the resin is loaded, it is separated from the water and mixed with brine (NaCl) to exhange chloride with target anions off the resin. This is known as "regeneration."



Miex Dimensions



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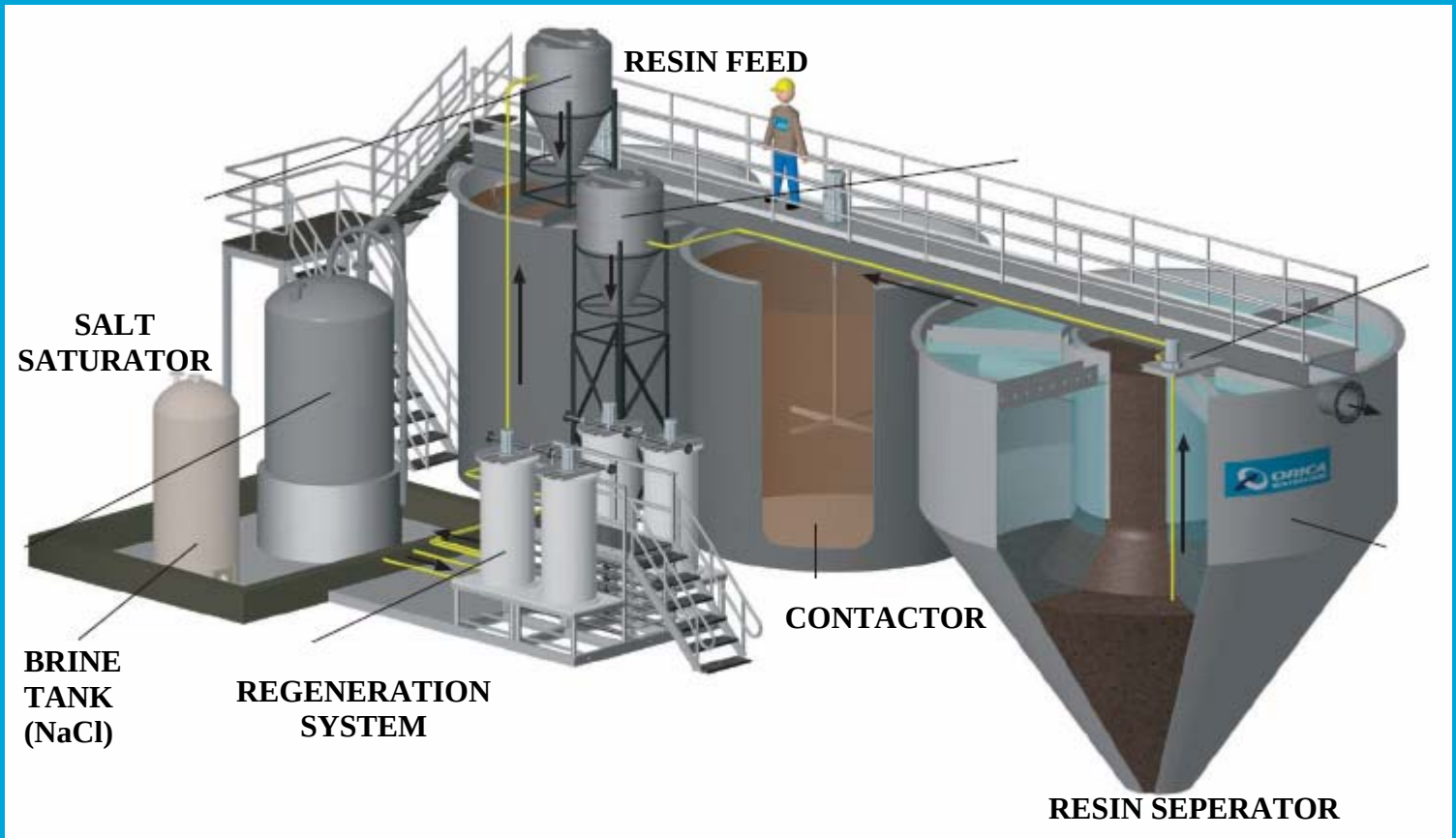
MIEX standard installation



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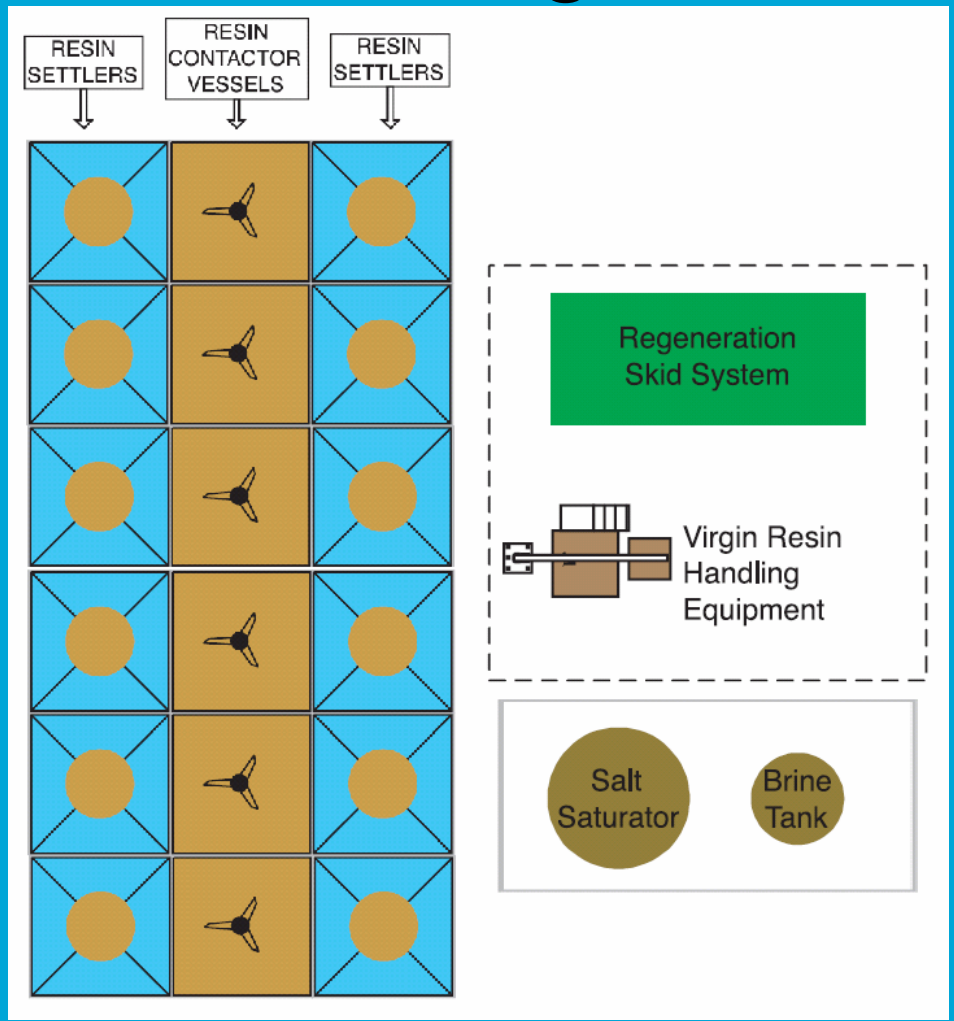
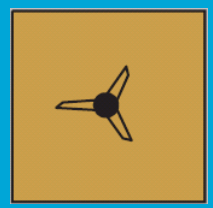
MIEX Design

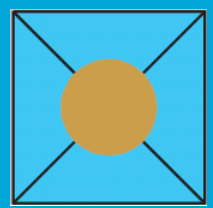


Retention time contactor vessel
15 minutes

Loading rate resin settlers
244 l/(min * m^2)



6 resin contactor vessels
Tank = 167 m^3
Height = 6 m
Diameter = 6 m



12 resin settlers
Each tank = 23 m^2
Diameter = 5,4 m

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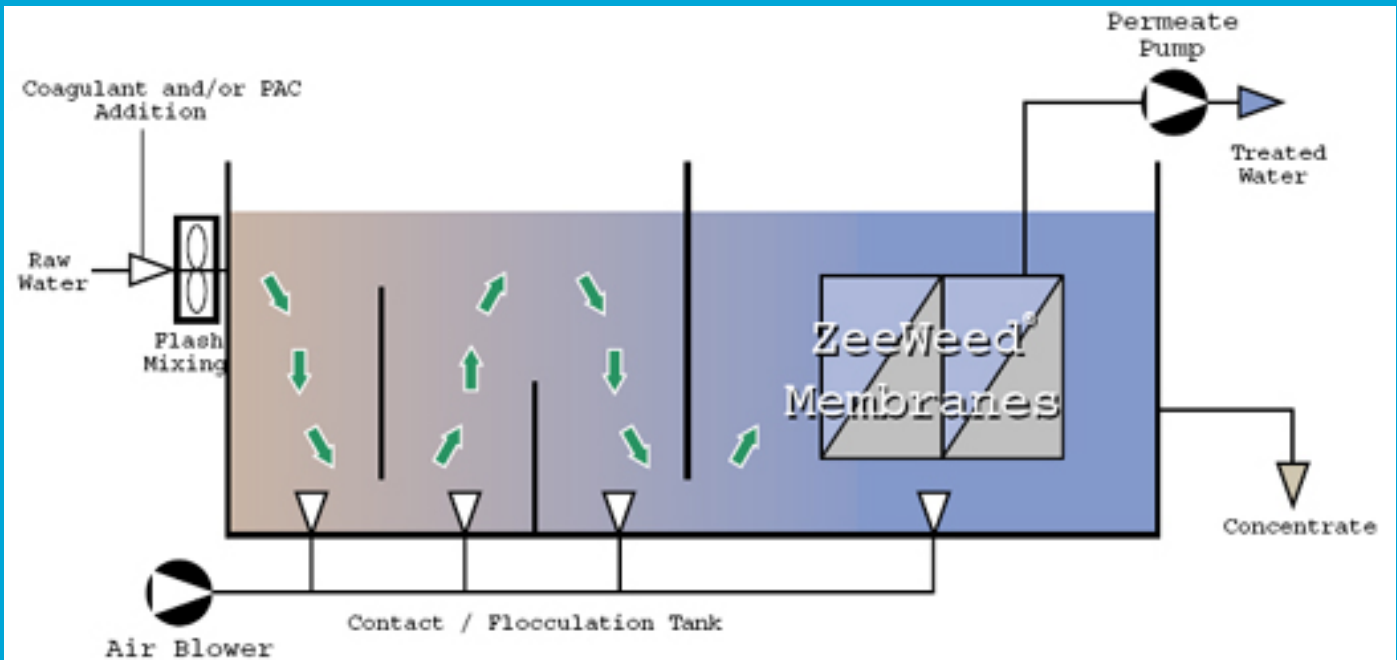
Ultrafiltration - process

Low pressure immersed ultrafiltration

The membrane surface is kept clean though aeration and membrane back-pulsing.



Ultrafiltration - capacity

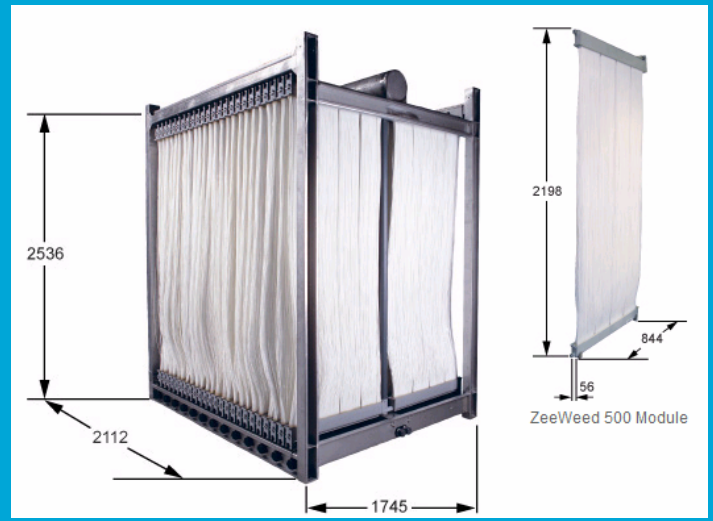
Low pressure immersed ultrafiltration

Design of streets of 2000 m^3/h

Surface loading membrane 70 l /m^2 ·h
Required membrane surface area: 28.500 m^2

Zenon ZeeWeed 500 hollow-fibre membranes
Specific surface area/module: 31.6 m^2
60 modules/cassette ≈ 1900 m^2/cassette

For 2000 m^3/h are 15 – 16 cassettes required



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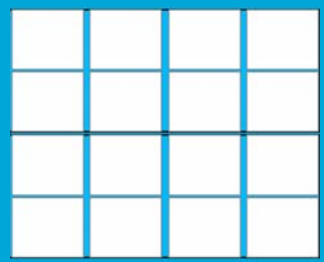
Ultrafiltration - dimensions

Dimensions ultrafiltration cassettes
- 1.75 x 2.1 m
- height 2.7 m
- 16 cassettes in 1 street

Selected layout:
- 3 streets of 2000 m^3/h



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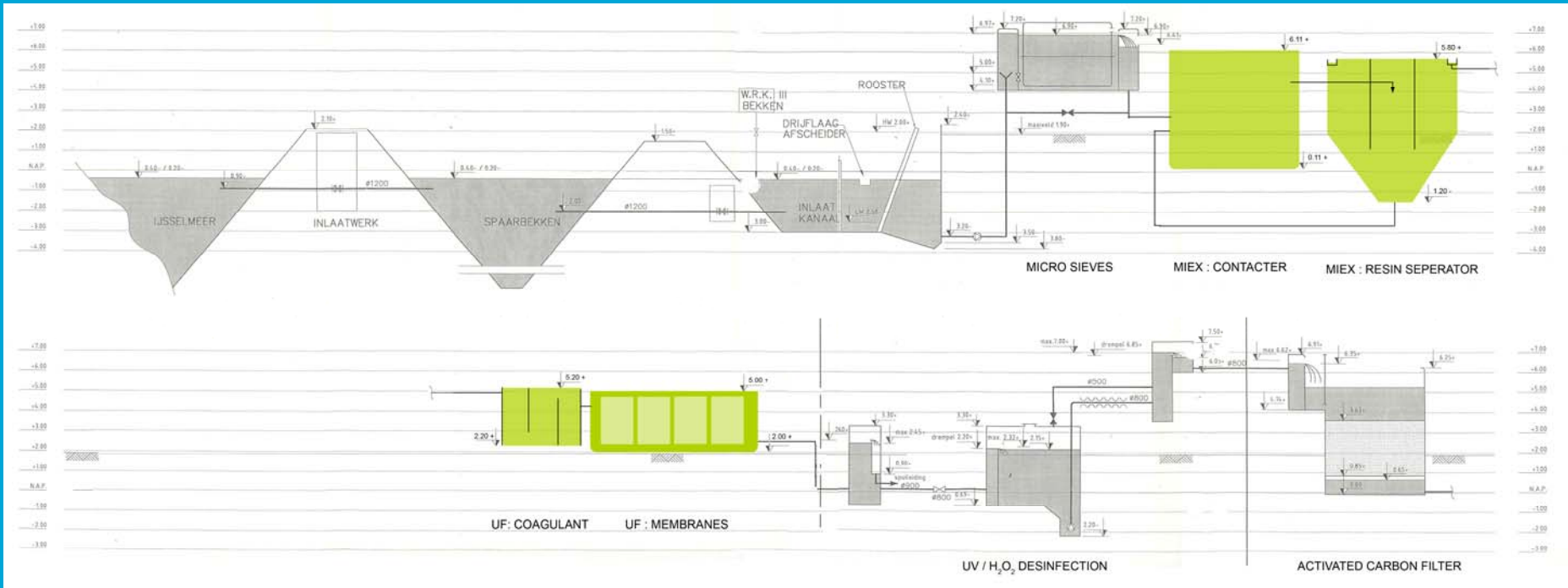
Hydraulic layout



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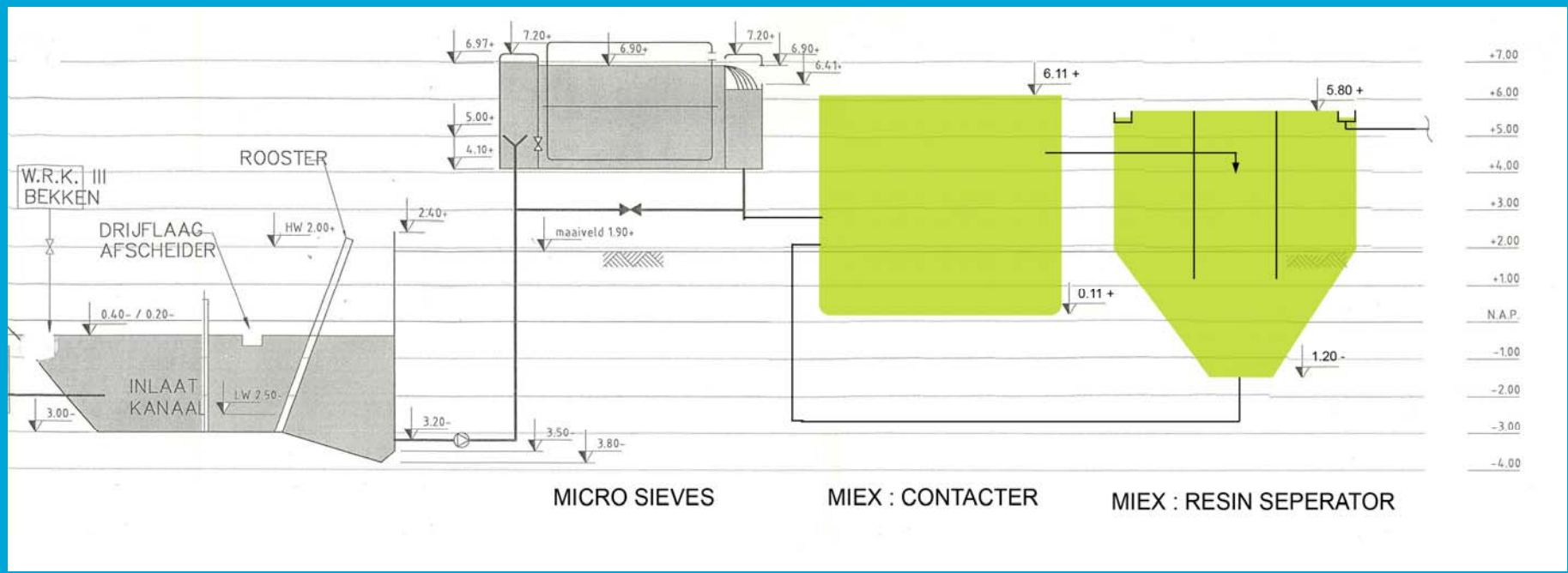
Hydraulic layout



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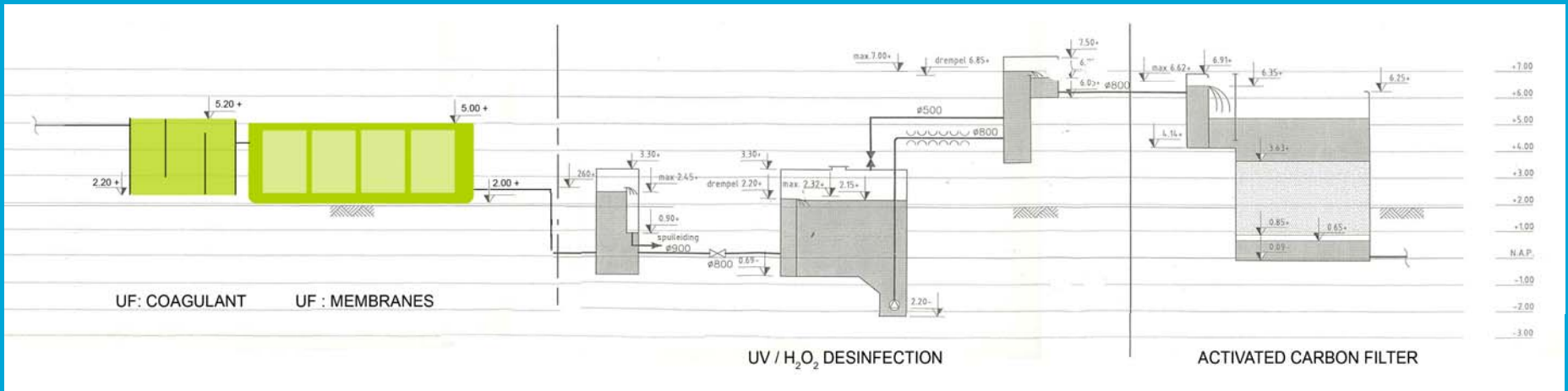
Hydraulic layout



Main water flow scheme

= resin

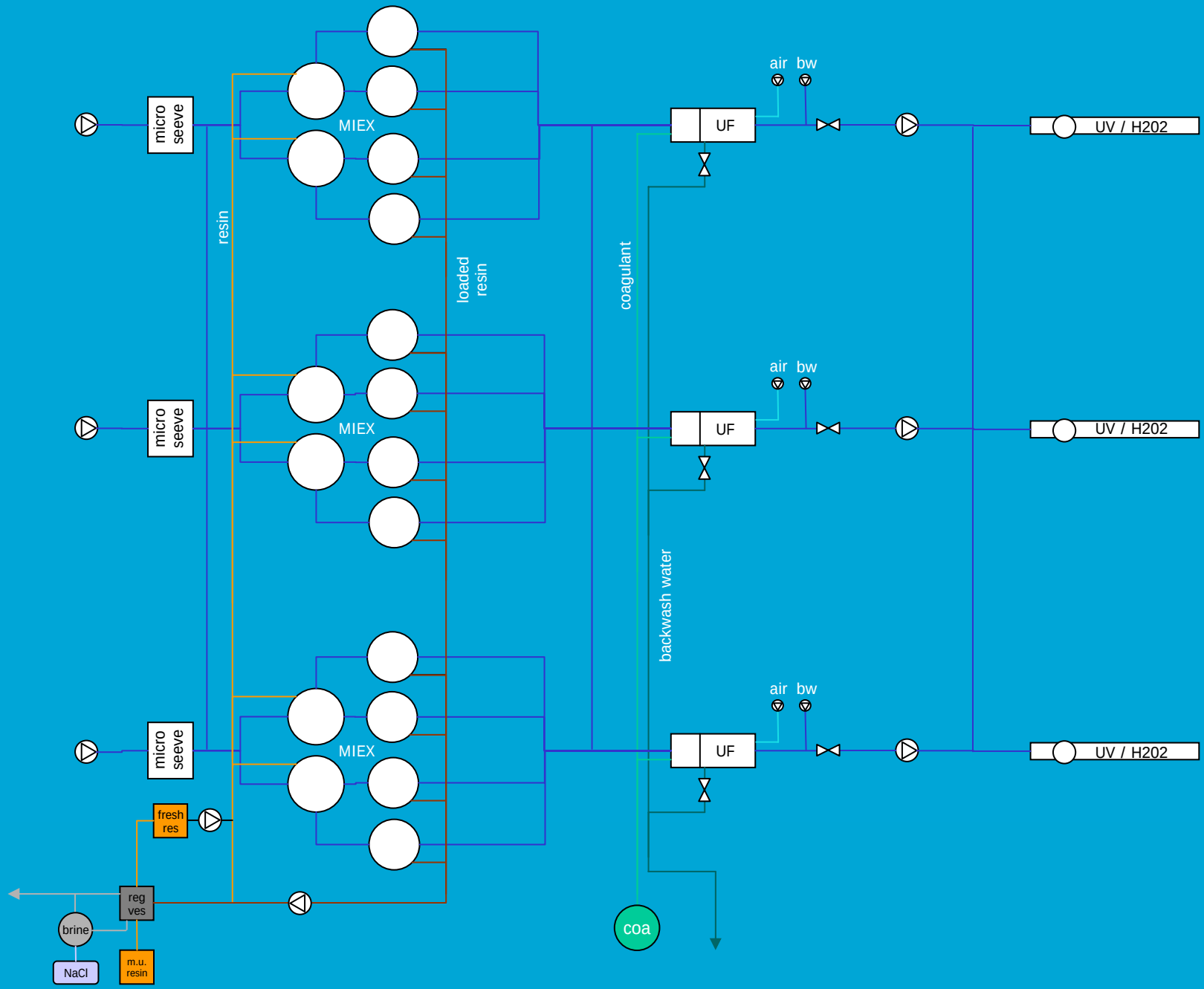
= water

= backwash water

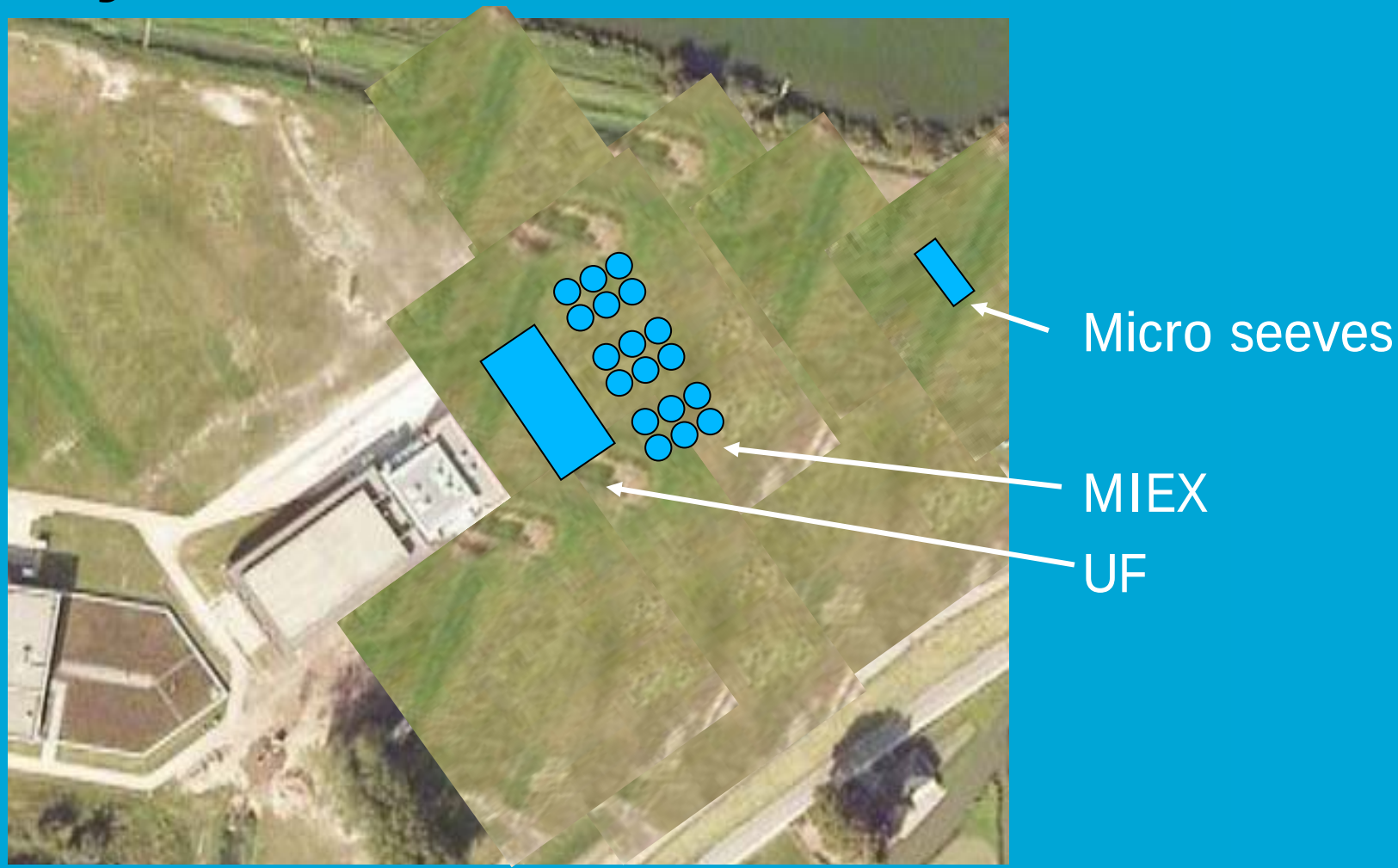
= coagulant

= used resin

Only the treatment till the UV/H202 in flow scheme


micro seeve
micro seeve
micro seeve
MIEX
MIEX
MIEX
resin
loaded resin
coagulant
backwash water
UF
UF
UF
air
bw
air
bw
air
bw
UV / H202
UV / H202
UV / H202
fresh res
reg ves
brine
NaCl
m.u. resin
coa

Layout



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Questions?