

Softening

Design of 4th Mega location Oasen

CT 5520

Drinkingwater Treatment 2



Floor van den Berg
Udo Ouwerkerk

27 April 2007

oaseo

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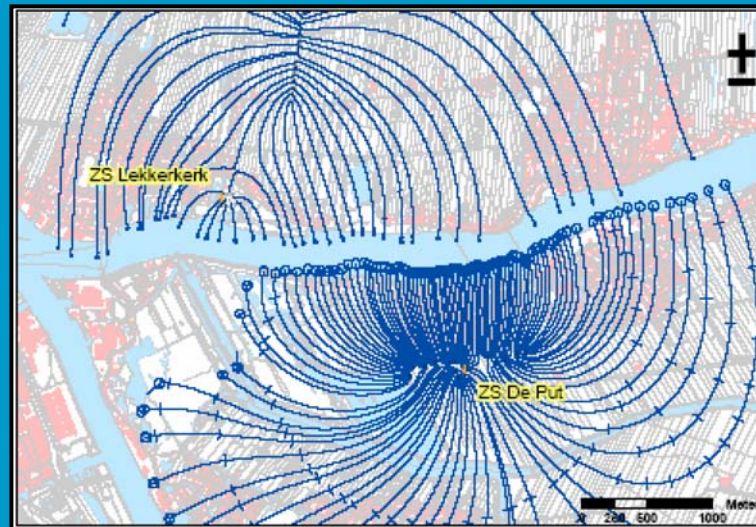


Initial findings

- Objective

Combination of wtp de Put and wtp Lekkerkerk.
Softening added to the existing proces.

*How implement this in
the best way and what are
the alternatives for softening?*



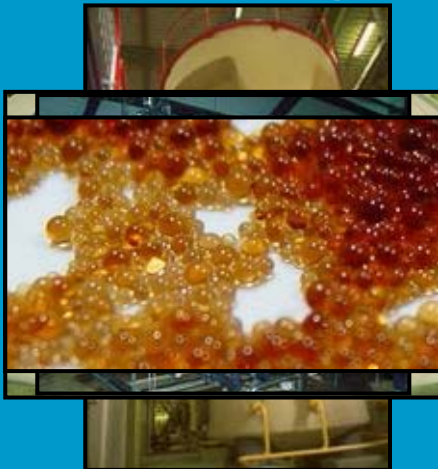
Initial findings

Boundary conditions

- Lack of space at zs de Put
- Realization in three phases
- Concentration of ammonium needs to be controlled
- UV-desinfection and AC-filtration have enough capacity to fulfill
- Filtration steps are in a fine working order
- Maximum extraction of 8.5 Mm³/year
- Max height for softening (13 meter)

Alternatives

- Membrane filtration
- Softening
 - Aerobe
 - Anaerobe
- Ion exchange



- Advantages

High(er) capacity used of filter media.

No extra filtration step.

- Disadvantages

- Disadvantages

Too expensive.

- Disadvantages

Absence of oxidizing agents of salt needed.

High(er) filter capacity.

Relatively good compatibility.

High(er) base/chemical dosage.

Selection

- Water quality

Hardness: 2.5 mmol/l → 1-1.5 mmol/l

Max. amount of ammonium 0.2 mg/l



- Water quantity

Phase	Production wtp Lekkerkerk [Mm ³ /year]	Extraction License [Mm ³ /year]
1	3.0	4.0
2	6.0	8.5
3	8.5	8.5

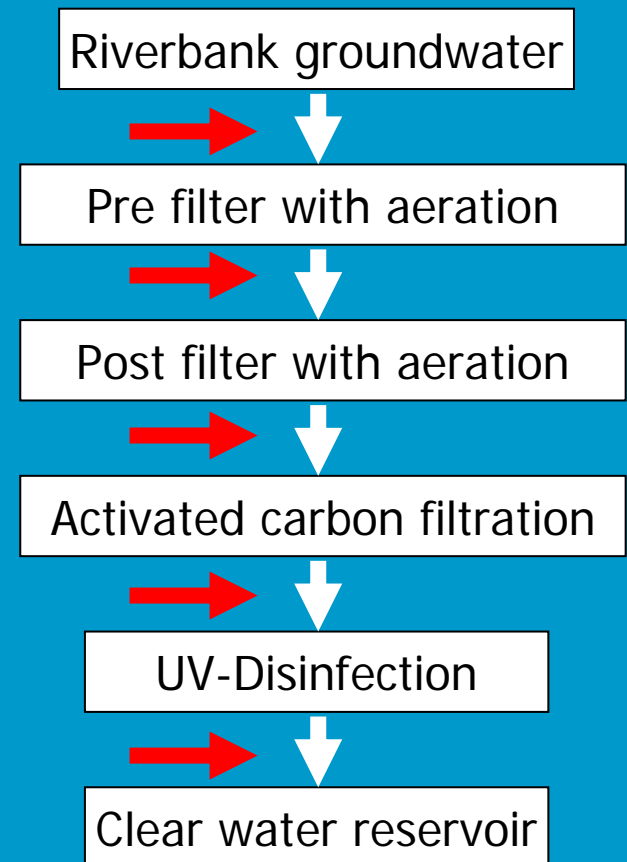
Selection

Alternative: Softening (Aerobe / Anaerobe)

- *No production of waste water.*
- *No large amount of NaCl needed.*

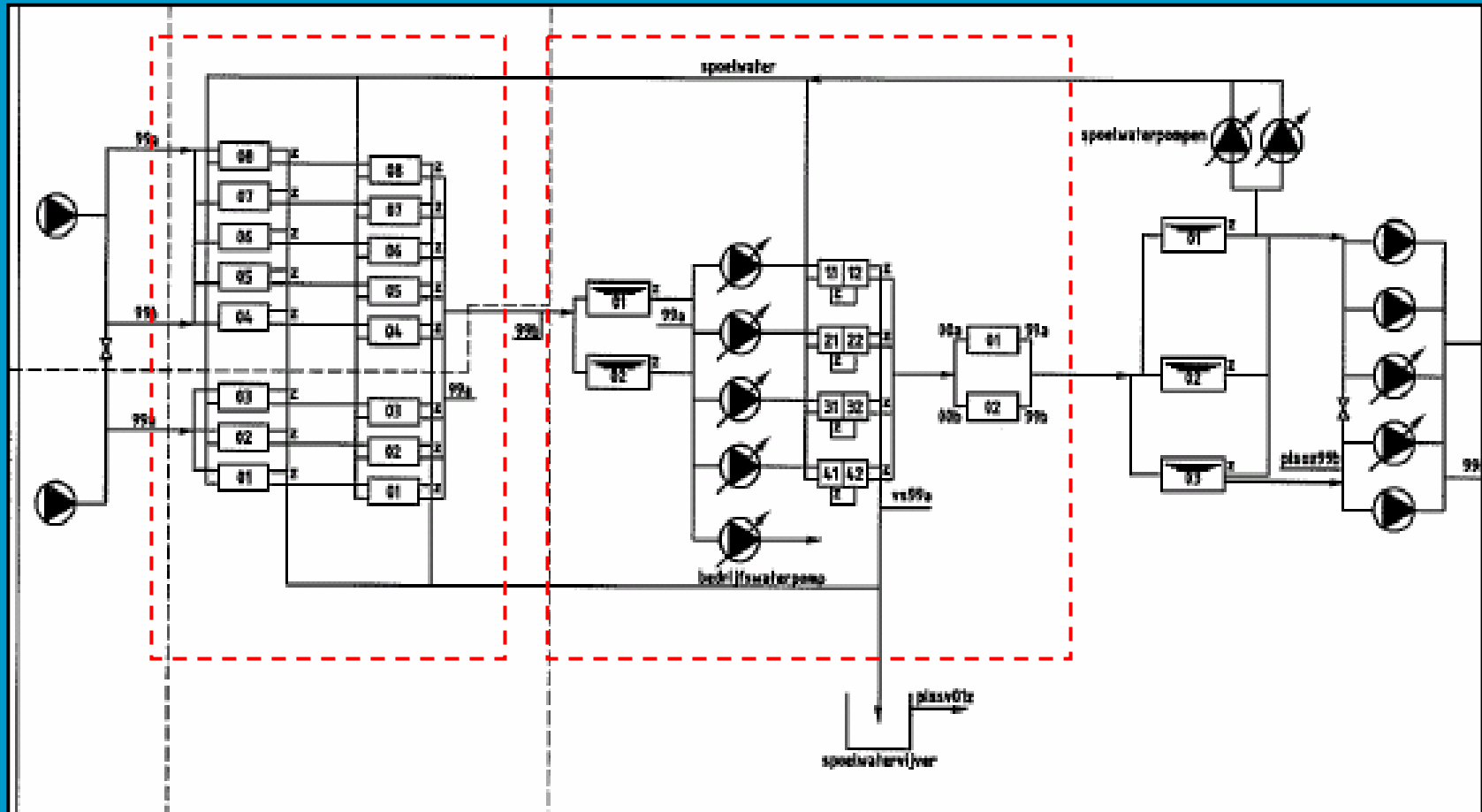
Possible positions

- Anaerobe
- Aerobe

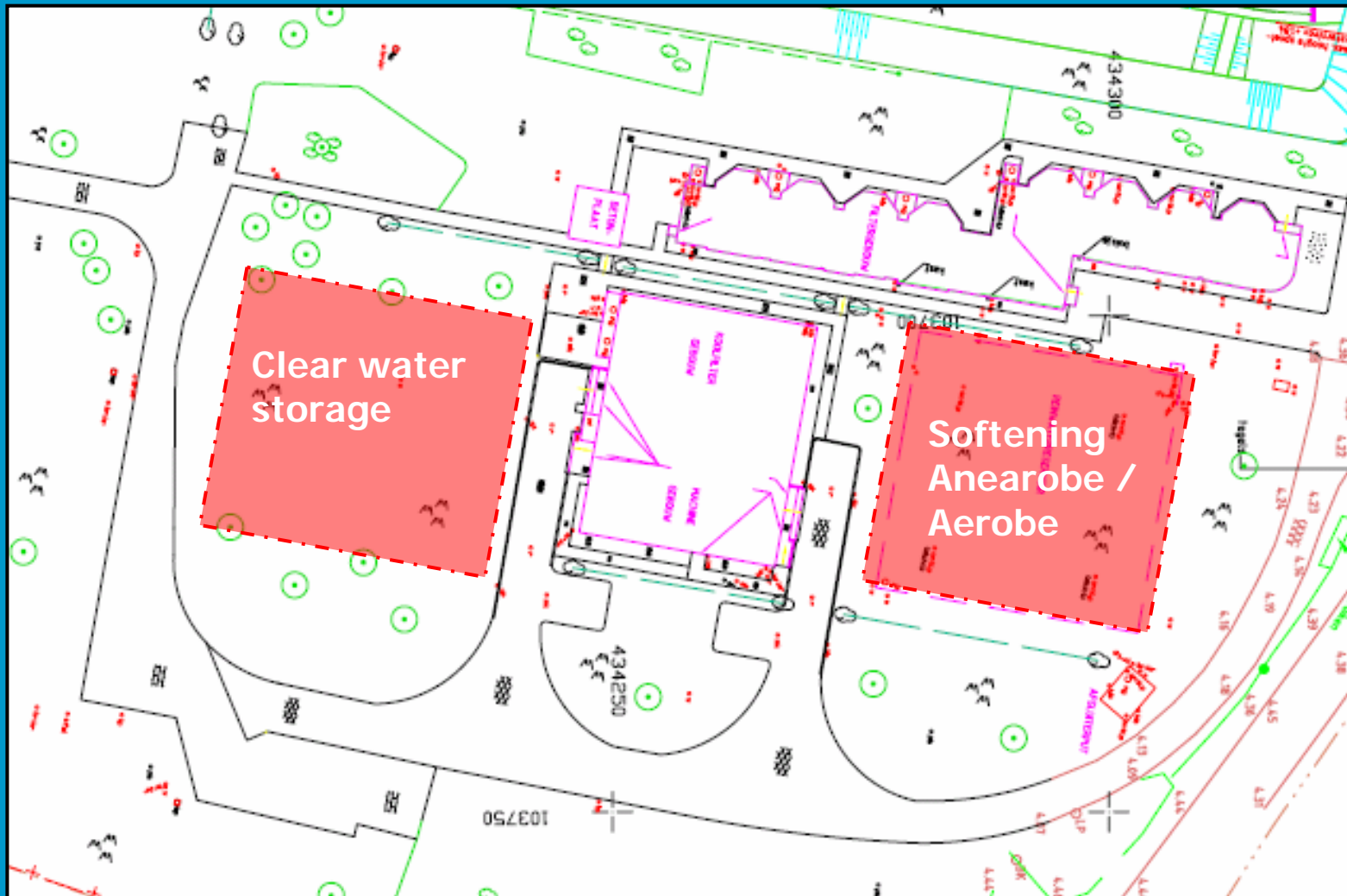


Selection

Alternative: Combination of anaerobe and aerobe softening



Selection



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Next step

- Chemical dosing
- Split treatment
- Construction alternatives
- Process flow diagram
- Hydraulic line
- Lay-out



Questions?



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