



# IRON REMOVAL WITH AMF2 FILTERS



f i l t r a t i o n s o l u t i o n s

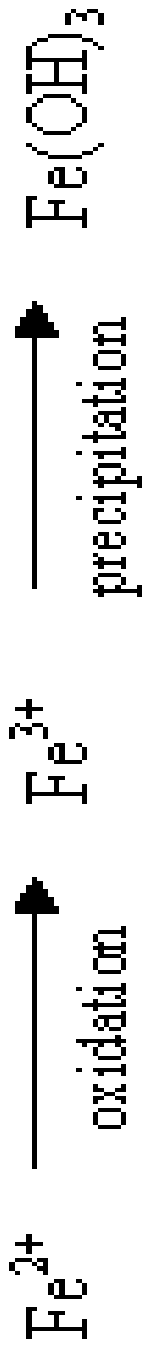
# IRON REMOVAL FROM WATER

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- Iron is one of the richest metals on the Earth's crust.
- Ground waters are naturally anaerobic: so iron remains soluble in the form of  $\text{Fe}^{2+}$ .
- Iron does not present a danger to human health or the environment, but it brings an aesthetic unpleasantness and bad odors.

# IRON REMOVAL FROM WATER

- The formula for natural removal of dissolved iron:



- The oxidation can be achieved by chemical means or by aeration
- Removing the suspended oxidized iron can be achieved by sedimentation or filtration

# THE CHEMICAL PROCESS

- By use of stronger oxidants such as the chlorine dioxide (ClO<sub>2</sub>), ozone (O<sub>3</sub>) or by potassium permanganate (KMnO<sub>4</sub>)
- This process can be carried out by cascading or spraying open-air systems.
- Process is efficient for maximum **Fe<sup>2+</sup>** content of **7mg/L.**
- These systems require a significant foot print.

# THE PHYSICAL PROCESS

- By aeration in aeration tanks or cascades.
- In the case of acid water, the treatment could be supplemented by a correction of the pH.
- The precipitate  $\text{Fe}(\text{OH})_3$  is then separated from the water by means of filtration or sedimentation.

# REMOVING THE SUSPENDED IRON

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- Removing the suspended iron can be achieved by filtration or sedimentation pools
- Traditional filtration is granular filtration
- Both methods require large area

# RAMENSKOE, RUSSIA

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- City of Ramenskoe next to Moscow – 300,000 residents.
- City water from local wells with high iron content.
- Several pumping stations, the one with the highest iron content was chosen for first project.
- Iron content – 3 to 10 mg/l.
- Flow rate – 250 m<sup>3</sup>/hr at max.

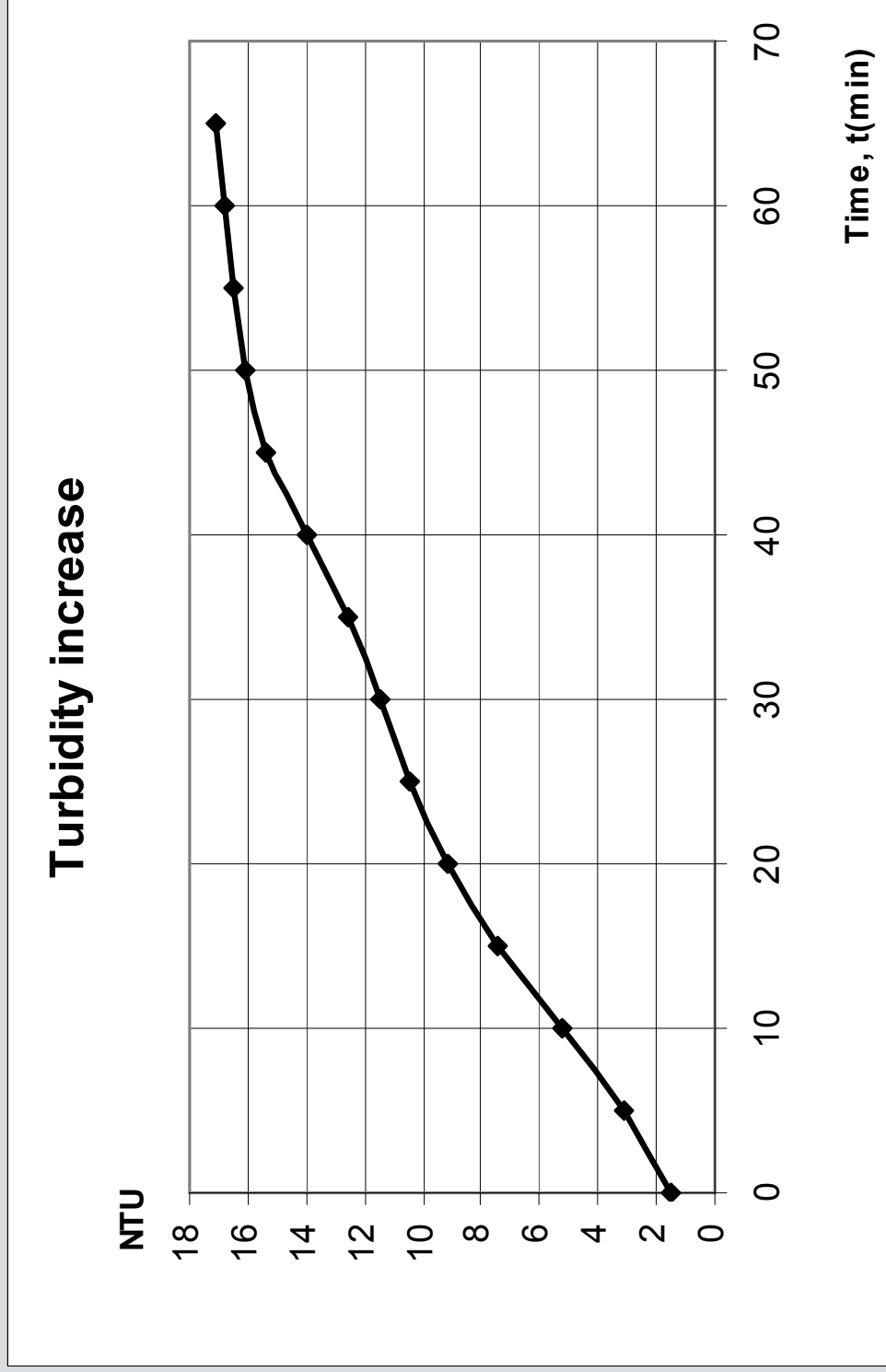
# RAMENSKOE, RUSSIA

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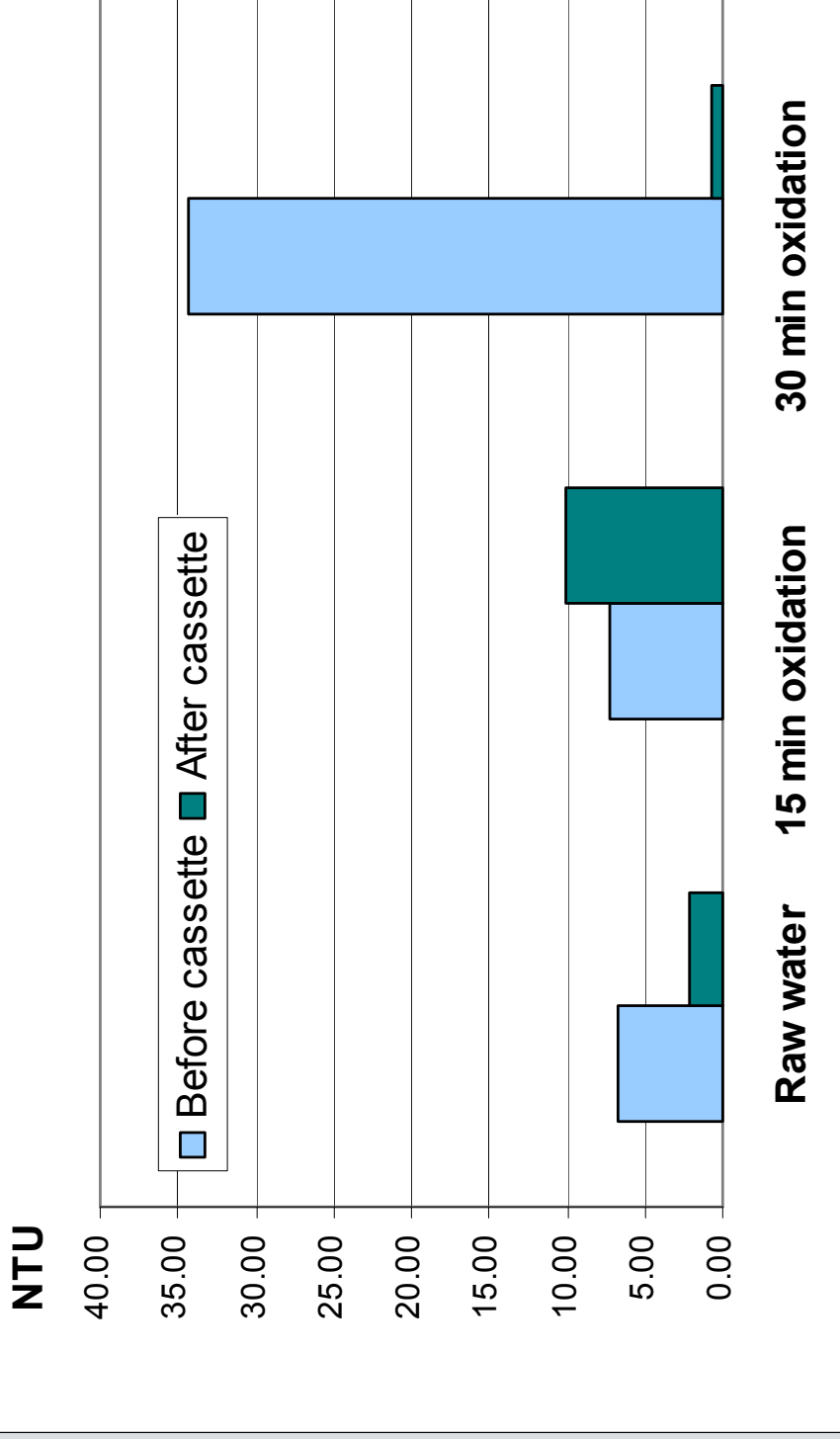
- Technical concept:
  - Turn the dissolve Fe<sup>++</sup> to Fe<sup>+++</sup> by means of aeration
  - Remove suspended solids with AMF
- Purpose of test
  - To test and verify the concept
  - To determine retention time in aeration test
  - To determine type of cassette required
- The test was the most important marketing act.



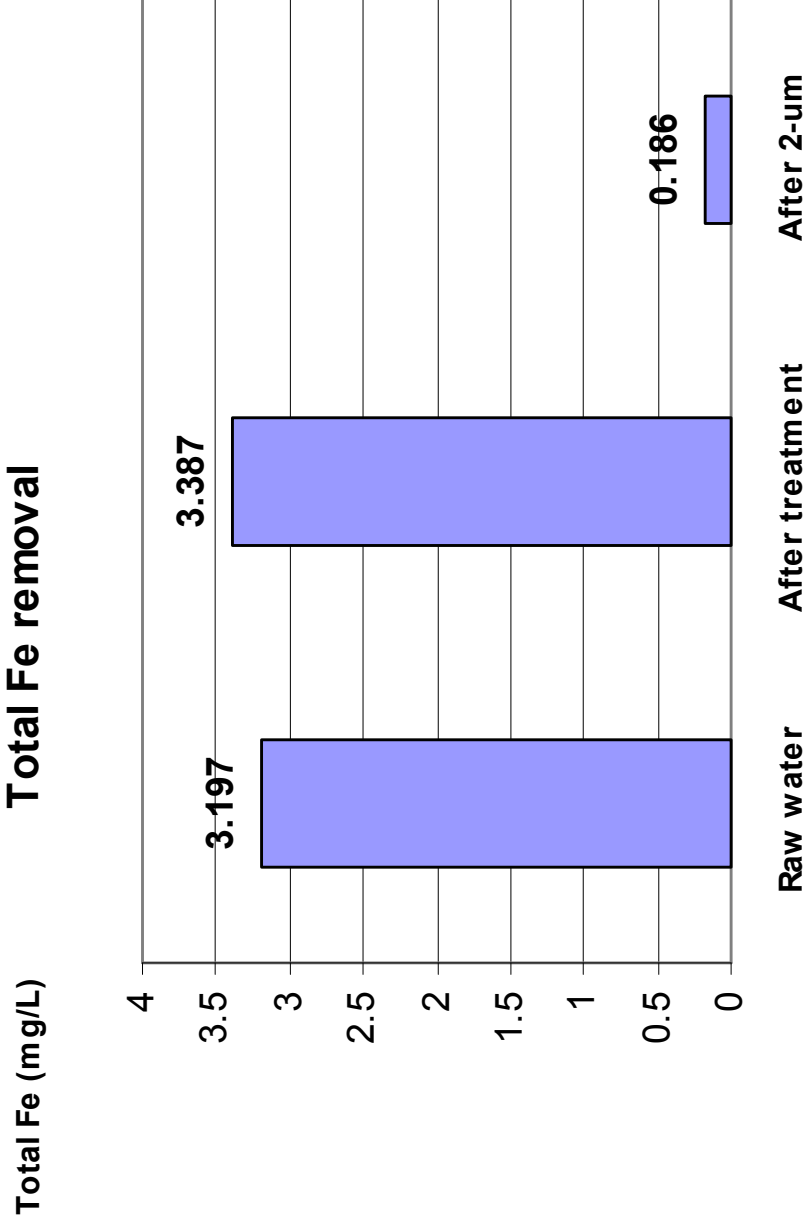
# FILTRATION TEST RESULTS



### 3-micron cassette. Turbidity test, 17.04.06

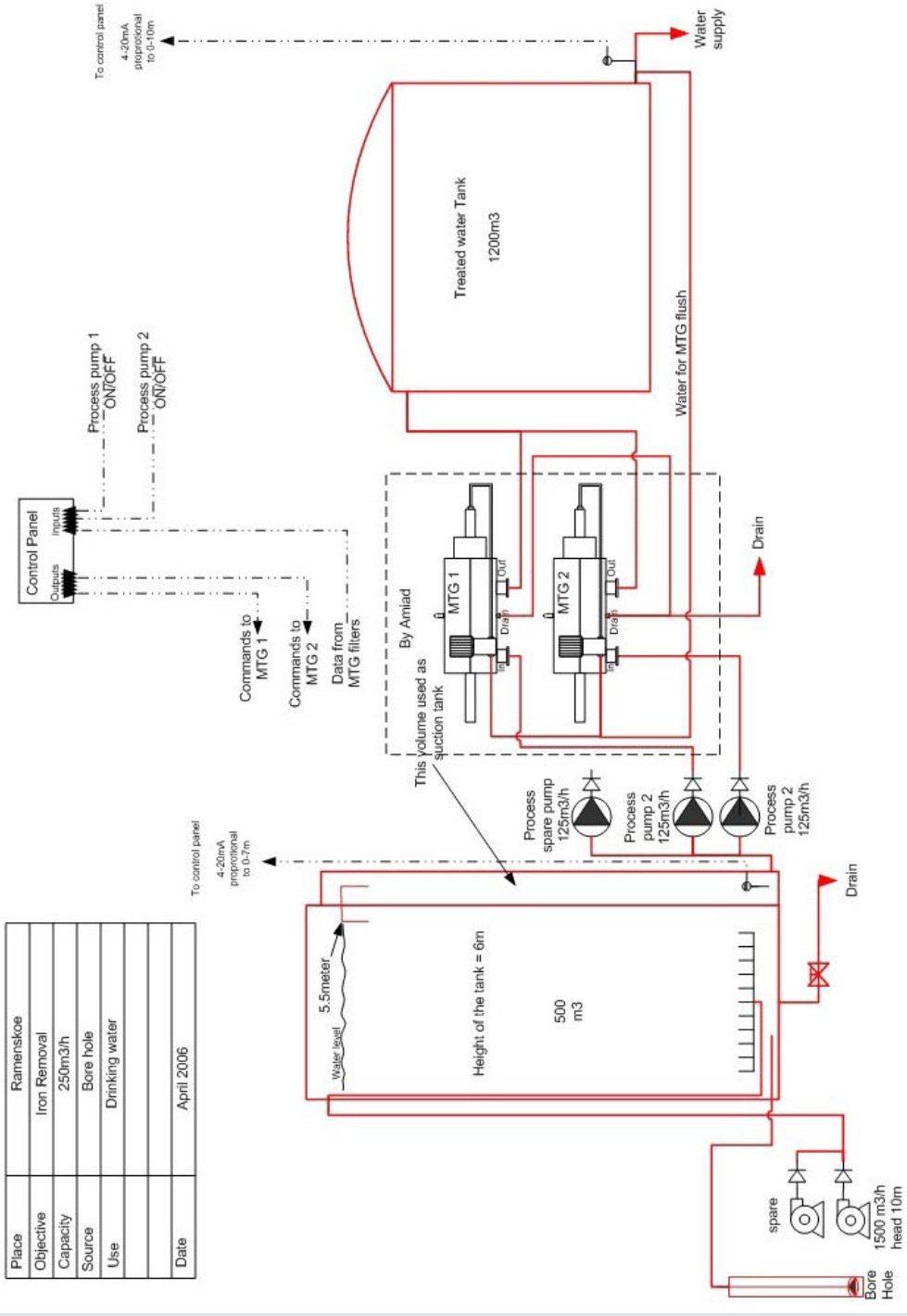


### Total Fe removal



# PROCESS LAYOUT

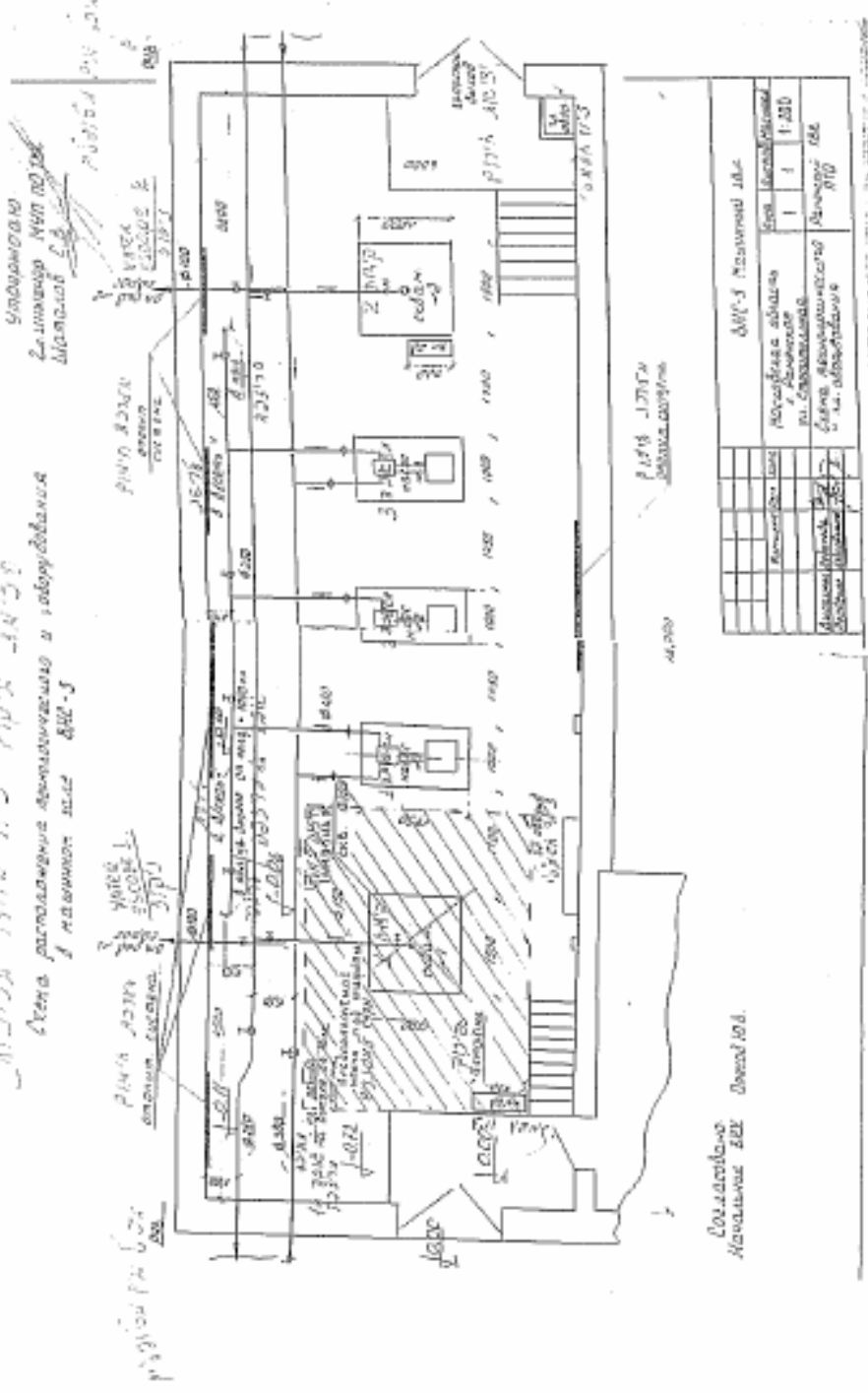
Place	Ramenskoe
Objective	Iron Removal
Capacity	250m <sup>3</sup> /h
Source	Bore hole
Use	Drinking water
Date	April 2006



# ANIMATION OF IRON REMOVAL

# STATION BUILT IN EARLY 60'S

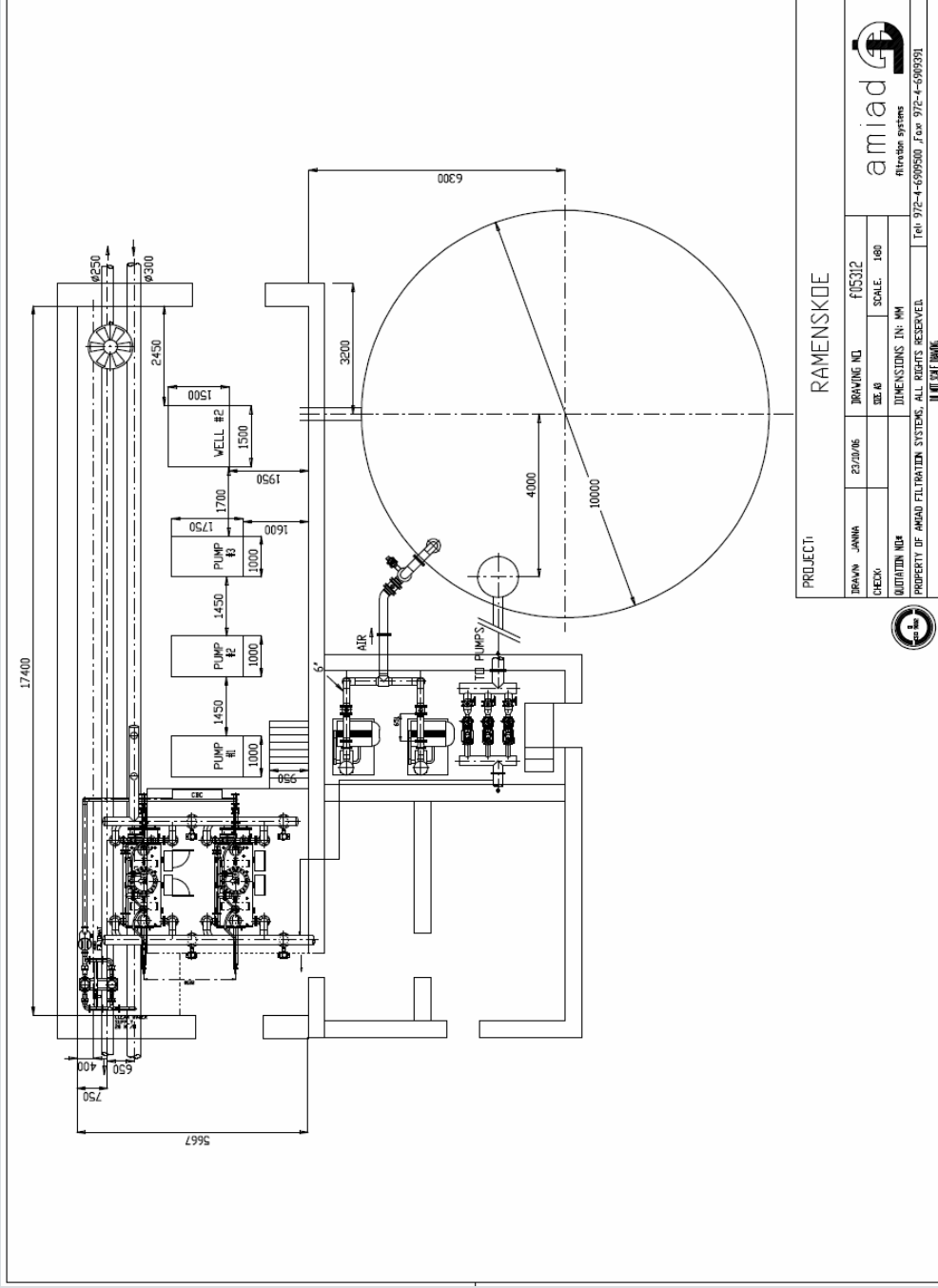
## CUSTOMER SUPPLIED DRAWINGS



# STATION - BEFORE

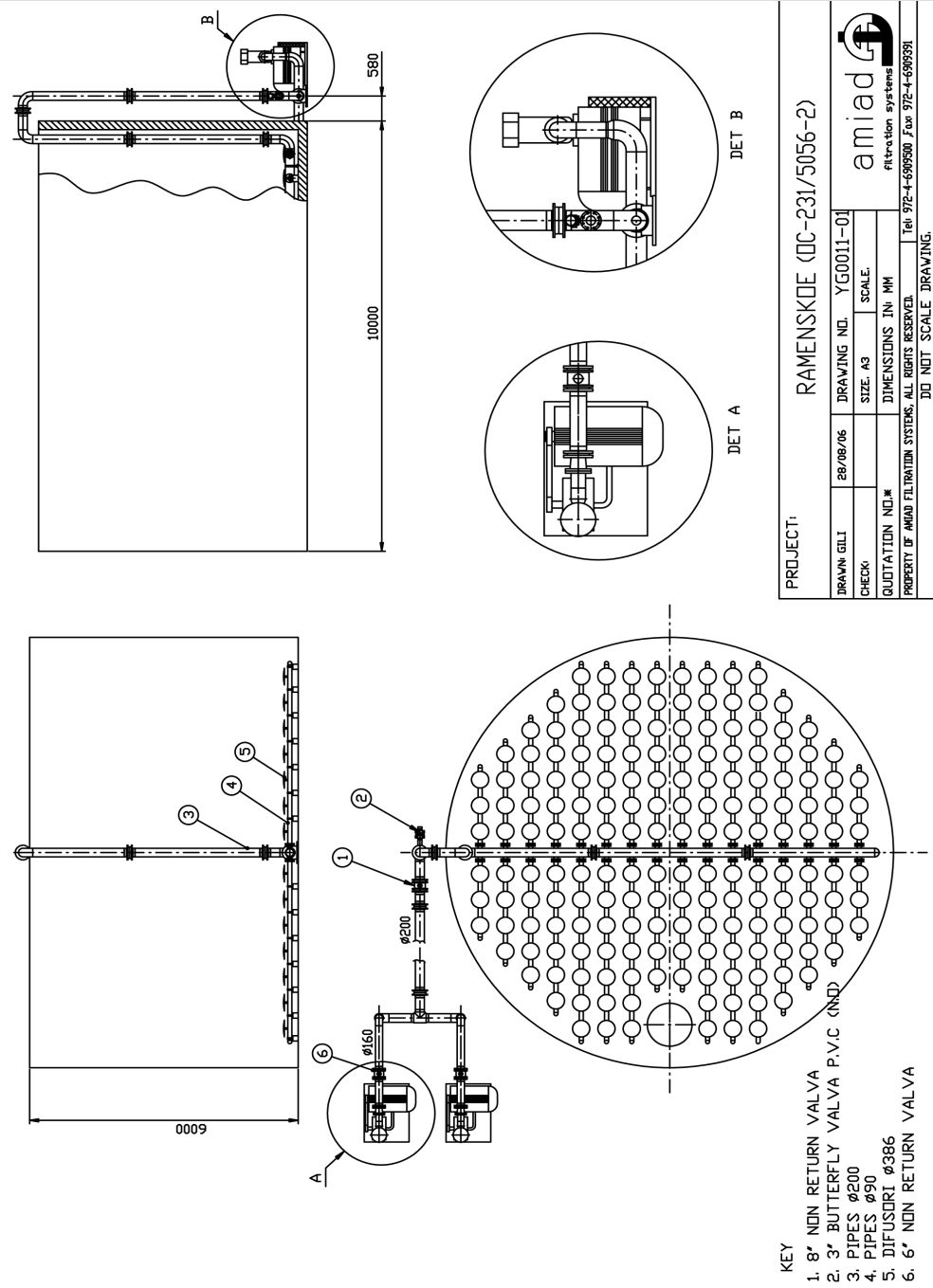


# AMIAD'S SYSTEM DESIGN

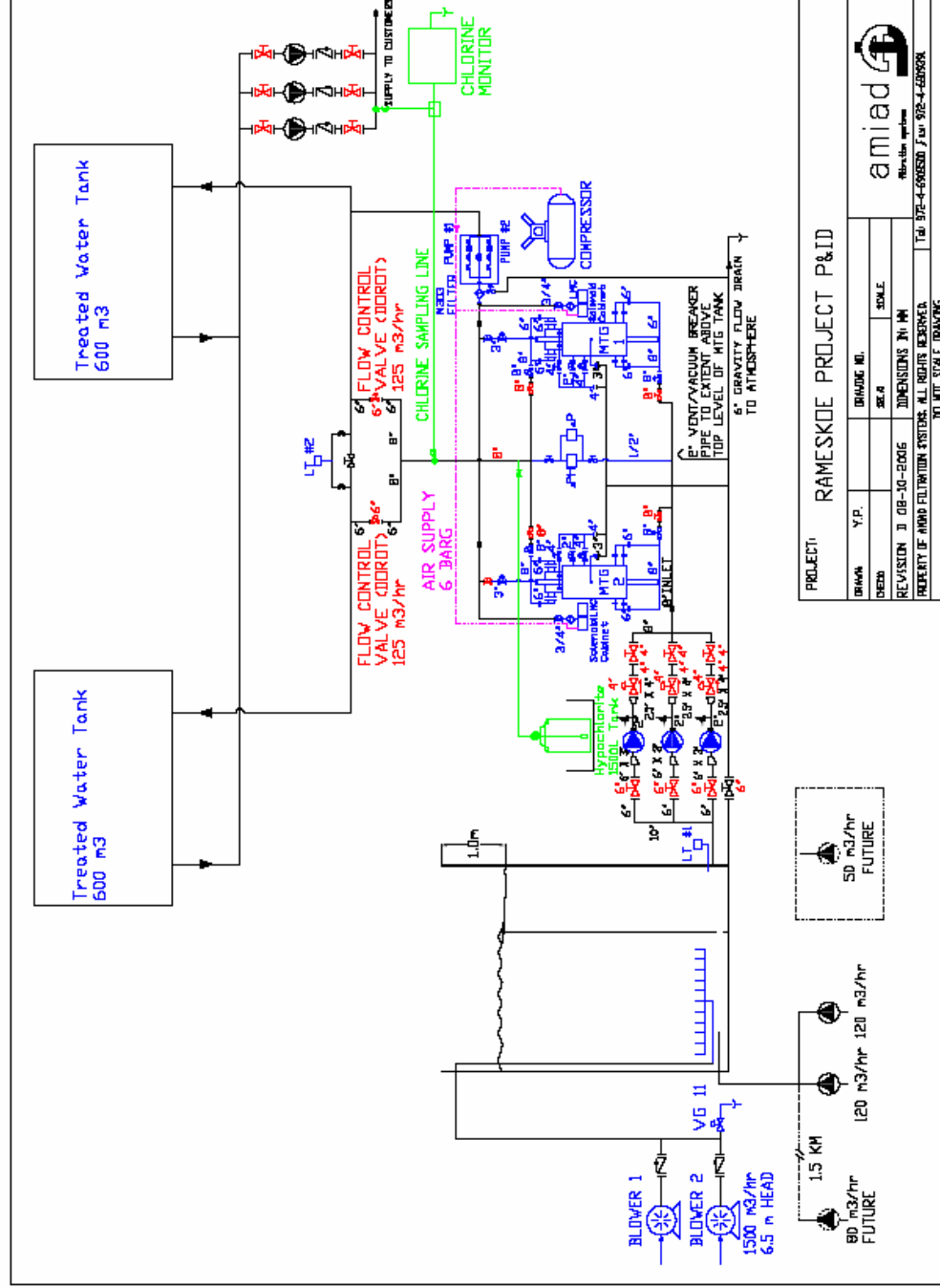




# AERATION PROCESS



# P & ID



# AERATION TANK



# DIFFUSERS IN AERATION TANK



# WATER AFTER AERATION



# 2 X AMF<sup>2</sup>-370K INSTALLED





# OPENING CEREMONY





# OPENING CEREMONY





Raw Water



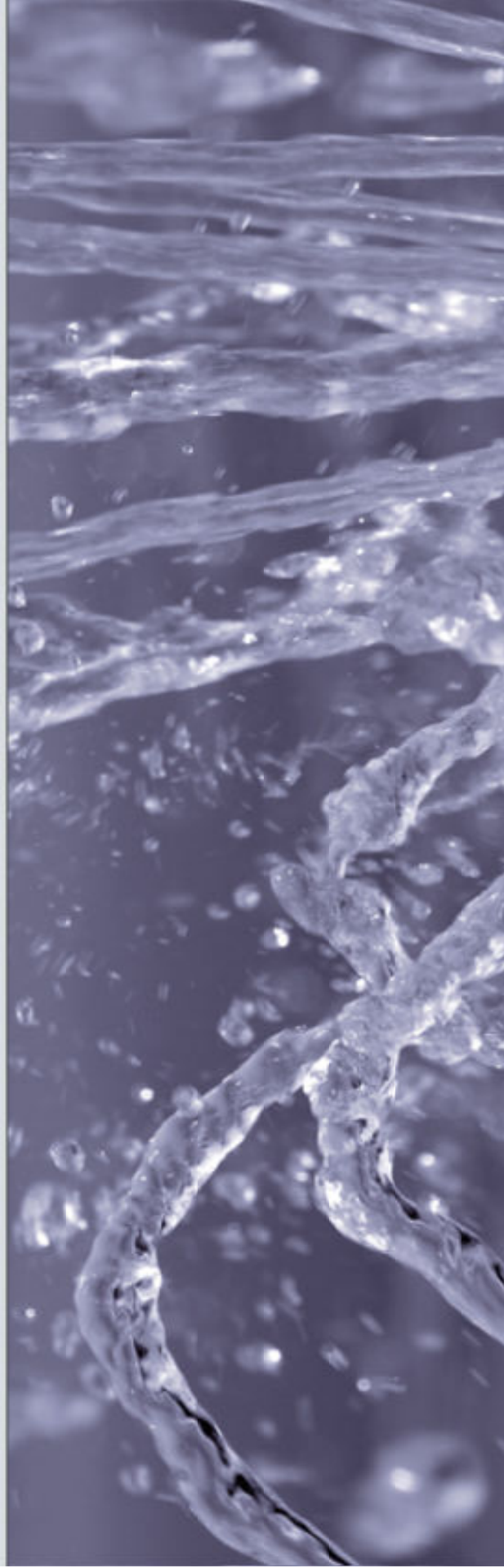
After oxidation



Treated water



THANK YOU



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