



Top design for sustainable, advanced water treatment

# Innovative technology in the service of drinking water treatment

PWN Water Supply Company North Holland was founded in 1920. Time and again, the organization has found new and better ways to satisfy the growing demand for clean drinking water. PWN has always held a prominent position among water companies when it comes to new technologies for water treatment.



The development of techniques such as surface infiltration, deepwell infiltration and direct treatment of water has become imperative. For example pollution levels of Rhine water, which is used as a source of supply, both directly and indirectly via lake IJsselmeer, is relatively high. Improving treatment techniques had therefore been an essential component of maintaining the high quality of our product.

## Andijk: more than 40 years of innovation

In 1920 when PWN Water Supply Company North Holland founded, drinking water demand was satisfied by ground water treatment. However, growing demand forced PWN to use surface water as an additional source. In 1968 water treatment plant (WTP) Andijk was built for the direct production of drinking water taken from lake IJsselmeer (and river Rhine). Originally the plant's operations consisted of micro straining, breakpoint chlorination, coagulation, sedimentation, rapid filtration and post disinfection.

In 1978 the plant was upgraded with the addition of pseudo moving bed GAC filtration. Even after about 40 years of operation, WTP Andijk still met all Dutch drinking standards. Nevertheless, a second upgrade was implemented to install a universal barrier against pathogenic microorganism such as protozoa and organic micro pollutants such as pesticides. This retrofit included the world's first large scale application of advanced oxidation with UV/H<sub>2</sub>O<sub>2</sub>, which became operational in 2004. This advanced oxidation was placed between the existing pre treatment and GAC filtration. The GAC treatment provides removal of residual UV/H<sub>2</sub>O<sub>2</sub> and easily assimilable organic

carbon (AOC). Since the advanced oxidation with UV H<sub>2</sub>O<sub>2</sub> delivers a higher dose than necessary for primary disinfection, the breakpoint chlorination was abandoned.

PWN is planning to replace the existing pre treatment with new technologies, within the next three years.

## Always innovating

<b>1978</b>	PWN is the first to introduce pseudo moving bed GAC filtration
<b>1981</b>	Completion of treatment plant Juliana with innovative mixing, flocculation and lamella sedimentation
<b>1986</b>	PWN introduces an innovative pellet softening reactor with a better effluent quality and lower maintenance costs than previous designs
<b>1989</b>	World's first integrated membrane plant Jan Lagrand, Heemskerck; an innovative UF-RO design
<b>2004</b>	First full scale UV peroxide advanced oxidation plant
<b>2005</b>	Perfector-E
<b>2006-2007</b>	Perfector-R and Perfector-P. PWN's second UV/H <sub>2</sub> O <sub>2</sub> plant with new catalytic peroxide removal reactor
<b>2007-2009</b>	Development SIX technology and CeraMac technology
<b>2010</b>	Start design of world's largest SIX/Ceramac water treatment plant with a capacity of 120.000m <sup>3</sup> /day. Perfector VLE

## PWN Technologies, partner in water supply

PWN Technologies is a wholly owned subsidiary of PWN Water Supply Company North Holland. PWN supplies water to about 1,7 million people in Holland. PWN Technologies was founded in order to share the impressive R&D programme of PWN Water Supply Company with others. Our revenues are invested in our R&D programmes. This enables us to enhance our position as a leading solution provider.



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