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Drinking Water Engineering and Science Discussions

Interactive comment on "The Dutch secret: safe drinking water without chlorine in the Netherlands" *by* P. W. M. H. Smeets et al.

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Final Author Comments

Response to RC S1 : 'Review comments' , M. van der Walt, 09 Jan 2009

1) The secret we refer to is HOW the Dutch provide drinking water, which is not generally known. The 'secret' of how we can provide safe water without chlorine is what we want to make known. Therefore the title was slightly adapted into: "The Dutch secret: how to provide safe drinking water without chlorine in the Netherlands"

2) A discussion on why treatment efficacy varies between treatment systems and process types would lead into too much detail for this paper. We will provide a table with some general characteristics of the water quality. However, since the paper discusses the whole of the Netherlands, large variations can occur and the table will only provide

an overview of typical water quality.

3) With respect to these water quality parameters (temperature, pH, alkalinity, DOC), the variation within the Netherlands is quite large. Some typical values will be included in the water quality table.

Response to RC S9 : 'Review' , Chung-Hsin Wu, 27 Jan 2009

1) The secret we refer to is HOW the Dutch provide drinking water, which is not generally known. The 'secret' of how we can provide safe water without chlorine is what we want to make known. Therefore the title was slightly adapted into: "The Dutch secret: how to provide safe drinking water without chlorine in the Netherlands"

2) The comment that the Dutch approach needed good water quality and large land can be disputed. Groundwater in the Netherlands is generally of good quality and requires little treatment. Surface water however, especially the rivers Rhine and Meuse, is significantly polluted by wastewater, industry and agriculture in the large catchment, covering large parts of Germany, France and Belgium. One could consider this as indirect reuse of wastewater, since a significant part of these rivers consists of waste water.

The dune infiltration systems required a large land area, however at the time it was initiated, land was cheap and the system thus provided a cheap, robust and very effective way to make safe drinking water. (In time it has protected the dune areas from urbanization, resulting in the much appreciated natural reserves are now).

On the other hand, new technologies were developed, such as UV and UF, which require very little land and still provide safe water. So when land is expensive or scarce, these techniques can provide a solution. The authors will provide some comments on this in the paper.

3) A cost-analysis is very complicated for the Netherlands a whole since systems were gradually build over a hundred years time. Further more, local variables such as land

prices, labor, materials, taxes and energy cannot be translated to other parts of the world. On average the water costs Ă 1.31 per m^3 ranging from Ă0.99 to Ă 1.75 depending on the water supply. In general, groundwater is cheapest. An international benchmark in 2006 showed that the Dutch water prices are no higher than that of other countries that do use chlorination.

4) Although the Dutch have prepared emergency supply of water through temporary distribution networks and bottled water installations, this is not of interest to this paper. We have had no specific experience in this field (lack of floods and typhoons). Nor is emergency supply in line with the rest of the paper that discusses normal supply without chlorine.

Interactive comment on Drink. Water Eng. Sci. Discuss., 1, 173, 2008.