

# Case History: H<sub>2</sub>S Removal Using *Cuf*

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## Background

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A Water Utility wants to bring online a groundwater well to supplement existing drinking water supplies. The well water has high levels (2500 ppb) of hydrogen sulfide (H<sub>2</sub>S) which gives the water a rotten egg odor. Removal of H<sub>2</sub>S below the aesthetic objective of 50 ppb is required to eliminate odor from the water. A cost effective, low maintenance solution is required with a ~1 mega litre/day capacity (250 gpm).

## Solution

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Purifics' *Cuf* (Ceramic Ultra-Filtration) Technology is used to remove the H<sub>2</sub>S from the water. A *Cuf* system was piloted on the site to verify treatment capability, cost structure, to obtain full scale design data and to demonstrate sustainability. The *Cuf* pilot unit is a standalone system housed in a shipping enclosure that requires only power, communication and water connections as shown below. After piloting the full scale design is a simple linear scaled up from the pilot platform results.



## Performance

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The test program was run 24/7, accumulated over 1400 run hours and was remotely controlled and monitored. Several sample/drinking water events were used to assess the effectiveness in addition to detailed analytical.

After thorough testing and optimization H<sub>2</sub>S levels were reduced from 2500 ppb to <6 ppb (detection limit) which exceeded the aesthetic requirements and odor removal requirements. This was achieved while running a membrane flux of 350 LMH and TMP of 2-15 psi. Treatment cost consists of 0.1 kW-hr /m<sup>3</sup>.

The test program evaluated several reaction mechanisms before adopting the most advantageous solution. The H<sub>2</sub>S is removed and recovered as elemental sulfur and sulfate ion. This is essentially a ZLD Process (Zero Liquid Discharge). The only fluid loss is the periodic flux maintenance rinse which is 0.05 % of flow, and is sent to the municipal sanitary sewer.

The Consultant for the client brought Purifics' *Cuf* technology to this municipal drinking water application. The *Cuf* process displaces the complexity and other operating issues of conventional approaches such as pH shifts or air strippers.

## Full Scale Solutions

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With the pilot phase completed the next phase is full scale design.



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