



“ Changing from sand/anthracite filters to sand/Filtralite® filters resulted in longer run times and good water quality. “

## In Fredrikstad [NO] Drinking Water Treatment Plant, Filtralite® outperformed traditional media

### CONTEXT:

Frequent clogging of sand & anthracite filters  
Water turbidity at filter inlet: 1,1 NTU  
Filtration rate: 10 m/h

### Technical solution:

Dual media filter  
80 cm – Filtralite MC 1,5 - 2,5 mm  
60 cm – Sand 0,8 – 1,6 mm

Fredrikstad Waterworks in southeastern Norway has an annual water production of 15 millions m<sup>3</sup> and supplies the municipalities of Fredrikstad and Hvaler. During autumn 2003 they have renovated their dual-media filters. After around 8 years of operation, the volume of filter media in the existing sand/anthracite-filters was significantly reduced resulting in poor filtering effect.

When renovating the filters the waterworks was interested in testing alternative filter media and replaced the anthracite layer in one of the filters with Filtralite® media for evaluation. Filtralite® is a filter media made of expanded clay and delivered by Leca Norge AS. In March 2002 Filtralite® media was installed on top of the existing sand in one out of totally 8 filters. This filter was run for nearly a year in parallel to the other filters. The experiences from this period were so promising that Fredrikstad waterworks decided to use the new media in all filters. All old media was removed from the remaining 7 filters and new sand and Filtralite® media were installed. The plant was in full operation during the rehabilitation period. This was carried out by taking one filter at a time out of production while the other 7 were running. The operation of removing old filter media, cleaning,

repairs of filter bottoms and filling of new sand and Filtralite® took one week per filter. After the replacement of the filter media the filters contain 0.6 m sand with grain size 0.8-1.2 mm and 0.8 m Filtralite® Pure MC 1.5-2.5 mm.

The operational data for the plant after the refurbishment of the filters show that the filters operate as expected both in respect of water quality and filter run times.

The waterworks takes the raw water from the lake Isnesfjorden, which is connected to Norway's largest river Glomma. The quality of the raw water varies through the year. The turbidity can be up to 10 NTU and the colour as high as 100 mgPt/l in extreme periods. The treatment process consists of coagulation,

flocculation, sedimentation, filtration and disinfection. Aluminium sulphate is used as coagulant together with polymer. Caustic soda is used for pH-adjusting and sodium hypochlorite for disinfection. Typical turbidity into the dual media filters are 1,1 NTU, while turbidity on the effluent water is 0,06 NTU.

Coagulation and sedimentation are separated in two parallels and are followed by 8 parallel filters. Retention time for the water in the flocculation and sedimentation step is around 3 hours and 20 minutes. The total surface area of the filters is 256 m<sup>2</sup> and the normal filter velocity is 10 m/h.

