

HULLAND WARD WASTEWATER TREATMENT WORKS

The site visit will be to Severn Trent Water's Hulland Ward wastewater treatment works, which is an innovative constructed wetland that treats raw wastewater (including sludge) in a two-stage vertical flow constructed wetland treatment system.

Hulland Ward serves a population of approximately 900 people. The system was originally constructed in the 1960s comprising of a primary settlement tank, trickling filter and humus tanks, plus a storm tank. The ageing infrastructure became unsustainable, demanding increasing interventions to maintain compliance with regulatory discharge limits. Severn Trent required a new low carbon, low energy and simple to operate flowsheet that could treat highly variable flows and meet final effluent discharge concentrations of 30 mg/L biochemical oxygen demand, 50 mg/L total suspended solids, and 15 mg/L ammonia.

Through the R&D Strategic Partnership between Severn Trent and Cranfield University, Severn Trent's engineering team decided to trial the 2-stage VF wetland system developed in France (Figure 1). The system treats sewage and sludge in-situ, negating the need for regular sludge tankering from the site, and can reliably produce nitrified effluents to the desired target concentrations. The system performance has been monitored routinely through both Severn Trent own samples and with two Cranfield graduate students, which has enabled a deeper understanding of the challenges and benefits of adapting the technology to the UK. Following the first year of learning, the second stage VF wetland beds were retrofitted with forced bed aeration (FBA™) by ARM through Severn Trent's framework contractor, MWH. This has enabled improved ammonia performance year round, delivering 95% percentile effluent values that are consistently below 1.5 mg/L.



Figure 1: Hulland Ward WwTW (images from www.armreedbeds.co.uk and www.waterprojectsonline.com)

