

# Fullerton WwTW

## upgrade to a major wastewater treatment plant for Andover, Hampshire

by  
Gareth Mulreid BSc MRes, and Michael Stokes, A I Struct E

**F**ullerton Wastewater Treatment Works (WTW) is on the outskirts of the small thatched village of Fullerton, near Andover in Hampshire. The sewage from Andover is pumped 3km by a dedicated rising main to be treated at the Fullerton WTW, which is an existing double filtration plant, treating a population equivalent of 57,000. The flows from Fullerton WTW release into the River Test, an internationally renowned fly-fishing river. 4Delivery Ltd (4D) carried out the £10 million upgrade on behalf of Southern Water in time for the AMP4 compliance date of 31 September 2009.



Aerial photograph of Fullerton Wastewater Treatment Works

Courtesy 4Delivery

### Project Need

Andover has been identified as an area for future residential development which will increase the current population equivalent from 57,000 to 68,000. Various improvement works were required at Fullerton WTW to improve water quality to meet the new Environment Agency (EA) consent and the predicted future flows. The new requirements comprised a flow to full treatment (FFT) of 453 l/s, with minimum percentage removal across treatment of suspended solids/BOD/ammonia/phosphorus (SS/BOD/NH/P) up to a maximum allowable concentration of 20/10/3/1. The improvement works were an agreed AMP4 quality output.

### Scope of Works

Various options were considered during outline design to determine the most cost-effective solution. 4D was also responsible for

improvements to the sewage network in Andover and upgrading Anton Mill Lane Pump Station that passes forward 95 percent of the flows that are treated at Fullerton WTW.

The decision was taken to review the overall network catchment, Anton Mill Lane Pump Station and Fullerton WTW as one system and determine if a combined solution would solve the issues. Following the results of the network modelling, the scope of works for upgrading the sewage network, pumping station and WTW was revised to reach Southern Water and EA requirements with cost savings for Southern Water and 4D.

The review of the whole system identified an increased FFT would limit the discharges to river from the storm tanks at Anton Mill Lane Pump Station and Fullerton WTW.

The investigation also identified the works-generated liquors and imported cess were causing Fullerton WTW problems with high concentration of ammonia in the wastewater and risk of failing the EA consent.

The upgrade comprised:

- Using the existing dual primary settlement and storm tanks as dedicated storm tanks to increase the storm storage capacity;
- New cess reception facility for treating imported liquors;
- Two high rate plastic media filters with an integrated recirculation pumping station;
- Recirculation pumping station;
- 6 No. Cell, Severn Trent Services, tertiary sand filter with associated pumps;
- Two additional second stage humus tanks;
- Converting a disused sequencing batch reactor (SBR) into a new liquor balancing tank;
- New MCC control kiosks;
- New automated standby generator;
- Associated site infrastructure including distribution chambers, process pipelines, pumping plant, motor control centres, instrumentation and telemetry facilities, and new standby generator and cabling to facilitate the new works.

The cess reception facility incorporated a stone trap, grit removal facilities and a liquor balancing tank. Previously, the cess liquors were directly released into the inlet works which caused ammonia spikes in the treatment process. By feeding the cess liquors and works generated liquors into the works over a 24-hour cycle, using the old SBR tanks as a balance tank, these ammonia spikes, which endanger the consent, were attenuated.

The two new plastic media filters are 7m high and 27m diameter and designed to treat 75 percent of FFT with the remaining 25 percent treated via the existing trickling stone filters. Flow is fed into the new filters via a new pumping station which includes an

automatic recirculation facility to enable the filters to continue operation and prevent the process bacteria from drying out under low flow conditions. To enhance the process, a site-wide recirculation pumping station was incorporated to ensure the existing trickling filters did not dry out and also to enhance wastewater quality by maximising available filtration when flow conditions permit.

The new tertiary sand filter (TSF) was designed to treat 100 percent FFT. It comprised an above-ground concrete structure split into six cells and incorporated automatic backwashing to ensure wastewater quality is always maintained. Flow is transmitted to the sand filter via a new feed pumping station which incorporates an emergency bypass. Backwash water is balanced with the works-generated liquor before being treated through the main process units.

All of the new plant and equipment was put on the existing Southern Water site with most of the works being carried out as permitted development, although planning approval was obtained for all above-ground structures.

### Implementation

The construction programme was led by the constraints of a restricted site and the need to keep the plant in operation. Work started in October 2007 by the 4D construction team with close liaison with Southern Water operators.

4Delivery Ltd is a consortium comprising United Utilities, Costain and MWH. It is carrying out a programme of environmental improvement and water quality schemes for Southern Water across Kent, Sussex, Hampshire and the Isle of Wight. 4D was responsible for the design and construction of upgrading Fullerton WTW.

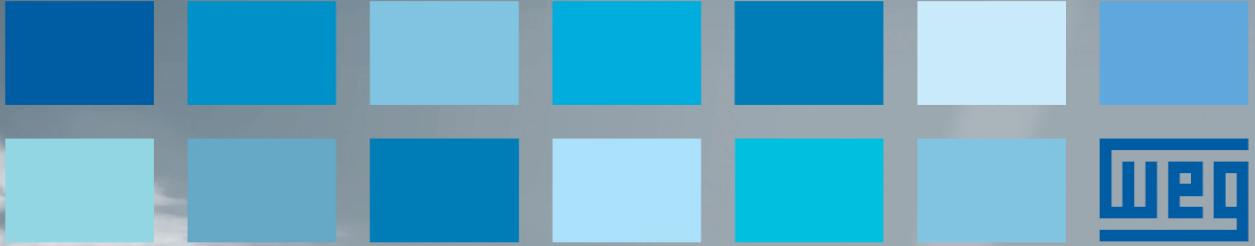
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Fullerton Wastewater Treatment Works

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