

# Wool Sewage Treatment Works

## £9m investment improves bathing water quality at resort

by  
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**A**s part of Wessex Water's £9m investment to improve bathing water quality at the popular resort of Lulworth a 9km pipeline is being constructed from Lulworth to Wool Sewage Treatment Works (STW). Major improvements are also being undertaken at Wool STW to cater for additional flows and to improve the quality of the discharge by providing chemical phosphorus removal.



Wool STW: Constructing ASP tank base

*courtesy: Wessex Water*

### The project meets three objectives:

- \* provide additional treatment at Wool STW to cater for increased flows within the catchment area, which will arise over the next 20 years;
- \* provide phosphorus removal to 1 mg/l at Wool STW as an AMP 4 quality output, by 30 April 2006. While the Dorset River Frome is not yet designated as 'sensitive' it will be from 2007/8 when both nitrate and phosphate removal will be required in the stretch from Poole Harbour to upstream of Dorchester;
- \* sewage treatment is required at West Lulworth. At present there is only preliminary screening of the effluent prior to disposal to sea. Sewage must receive secondary, biological, treatment to meet the Urban Waste Water Treatment Directive;

### Background

The options for providing local treatment at West Lulworth were heavily constrained by the views of residents, landowners, local authority planners, English Nature and the Environment Agency.

West Lulworth is in the Dorset Area of Outstanding Natural Beauty,

architects

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AONB, on the World Heritage Coast and is a very popular tourist destination. Attempts to identify a suitable site for a new sewage treatment works, which met the needs of the planners (Dorset County Council), local residents and the sensitive environment, were not successful. **Wessex Water, therefore decided to develop Wool STW as a single treatment centre and to pump sewage from West Lulworth 9km for treatment at Wool.**

Major disadvantage of developing Wool STW is that it discharges to the River Frome and therefore requires a higher level of treatment than required for a sea discharge local to West Lulworth. However, it was concluded that this disadvantage could be addressed by providing higher treatment standards and that the extended Wool STW provided a site outside the AONB, with easier access. It was also reliable to operate and met the future needs of an increasing population. Pumping costs are outweighed by the lower cost of treatment.

**Wool extension**

The extension to the existing works at Wool STW is designed to treat the increased flows from the existing catchment and West Lulworth to a 20 year planning horizon, and meet the new 1 mg/l phosphorus standard. The projected population equivalent of the new works at Wool STW will be 12,300 in 2010 and 13,600 in 2025.

As land adjacent to the works is either SSSI, or similarly environmentally sensitive, the new extension is being constructed on the site of the existing works which continues to operate throughout construction of the new works. Space is extremely confined on the site and careful phasing of the work is required in order to avoid putting the existing consent at risk.



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**Works proposed at Wool**

Main elements of the work at Wool STW comprise the following:

- \* new inlet works to receive all connected flows;
- \* new circular extended aeration activated sludge plant with integral final settlement tank (ASP2) - similar to the existing unit. Air blowers with fine bubble diffused aeration;
- \* refurbishment of the existing activated sludge plant;
- \* ferric sulphate dosing plant for P removal;
- \* sludge thickening plant;
- \* abandonment of redundant structures, including both the original and existing inlet works, primary tanks, biological filters, recirculation and sludge transfer pumping stations and old blower building/mess room.

The existing works comprises a single extended aeration activated sludge tank taking 70% of the flow and two biological filters taking the remaining 30%.

A new activated sludge tank, similar to the existing tank, is to be constructed on the site of one of the existing filters. During construction temporary treatment capacity is being provided by two *Copa* BAF Units. The existing activated sludge plant is to be refurbished after commissioning of the new ASP.

The works at Wool STW are being undertaken by *Morgan Est* under an NEC Option C Target Cost Design & Build Contract. *Morgan Est* has appointed *Naston* to undertake the Process and M & E design, and *Hyder* for the Civils Design.

**The works are currently due for completion by November 2005, five months before the regulatory deadline.**

**Works proposed at West Lulworth**

West Lulworth is completely surrounded by high ground and to transfer flows to Wool STW a static head of more than 100m has to be overcome. In order to achieve this high lift, three sequential tandem submersible pumping stations are being constructed. The maximum transfer flow will be 3DWF (25 l/s). Flows in excess of this will discharge to sea via a 150m<sup>3</sup> storm tank which will limit spills to 1.2 per bathing season.

The main transfer pipeline is a 9km long 225mm diameter HPPE pipe. The pipeline route was selected to keep the pumping stations as close as possible to the existing development in this highly sensitive natural landscape. The sites take advantage of existing hedges, houses and farm buildings to blend into the landscape. The route is mainly in farmland and along the road verges, avoiding areas of high archaeological interest and wildlife sites.

The pipeline works from Lulworth to Wool are being undertaken by *Clancy Docwra Ltd* under an NEC Option A Lump Sum Design and Build Contract. *Clancy* has appointed *B&V* as designers. ■

**Note on the authors:** *Dave Shepherd* is a project manager and *Drummond Modley* is the Wastewater Engineering Manager both for *Wessex Water*.



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