

Otterton STW

providing secondary treatment in a beauty spot

by

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Otterton STW is situated in East Devon in a spectacular position near Ladram Bay, with cliff top views to the Devon & Dorset Heritage Coast. All the surrounding area is designated as an Area of Outstanding Natural Beauty. Therefore, any project involving land purchase could have had serious planning approval implications.

The existing STW only provided primary treatment prior to discharging to sea. In the Natural Environment Plan the

Otterton STW serves the villages of Newton Poppleford, Colaton Raleigh, Bicton, Otterton, East Budleigh, Harpford and the Ladram Bay Holiday Camp. All sewage from the catchment flows by gravity to East Budleigh pumping station from where it is pumped to the STW. The pumping stations mechanical and electrical equipment was old and in poor condition and its replacement, therefore, formed part of the project to upgrade Otterton STW

Using South West Water's existing partnership arrangements, the team chosen for the project were *Faber Maunsell (Civils Designer)*; *MJ Gleeson (Civils Contractor)* and *Biwater Treatment (Process Design and Construction)*.

The works is subject to a seasonal increase in load from tourism through a more than doubling of the 3000 population to 7000 in summer. So, the solution had to have sufficient flexibility for both loading scenarios.

Solution

The solution chosen was the adding of conventional non-nitrifying activated sludge secondary treatment with final settlement tank without primary settlement. Apart from the UV channel, a new package inlet works, grit removal and surplus sludge thickening and storage were added. Standby generation for the whole site is also included. Meeting the large variation in population is achieved by shutting down one of the actuated sludge reactor tanks during the winter period.

Working within the constraints of a very tight budget and wanting to keep all new works within the existing site was complementary. All solutions to reduce the site footprint aided keeping the costs down.

Instead of building new aeration tanks, innovative use was made of two disused circular concrete storage tanks. These fully mixed reactors are preceded by an aerobic selector tank. All flows are pumped to the works, therefore large fluctuations in flow cannot occur. This reduced process risk was a factor in the use of a single final settlement tank.

Utilisation of the natural earthworks and bunding on which to build the Inlet Works removed the cost of manufacturing and erecting a steel structure to support the duty/standby fine screens, grit plant and liquid separators. These major savings totalled some £300,000.

Other savings introduced were:

To reduce the costs of erecting steel access stairs and platforms for submersible mixers in the SAS and Thickened Sludge Storage



Otterton STW: (Copyright: Still Imaging, Chudleigh, Devon; courtesy SW Water).

Tanks, externally mounted horizontal mixers were chosen. Mechanical parts i.e. motor and gearbox are accessible from outside the tanks for maintenance.

The Selector Tank located upstream of the two Aeration Tanks required a mixing facility to blend the incoming screened and dewatered sewage with the returned activated sludge and return liquors. A cost saving in capital and opex costs resulted from installing a sparge pipe near the floor of the Selector Tank, fed with air from the aeration blowers, in lieu of a mechanical mixing device.

The delivery pipework and valving of the RAS/SAS pumping station was simplified by the use of a 3-way electrically actuated valve which controls both the flows of RAS back to the selector tank and SAS to the storage tank. Normally, two dedicated actuator valves would be used.

Total cost of the project, including East Budleigh pumping station was £1.8 million. The works was commissioned on March 3rd 2003. ■

Note on the authors: *Andy Dawe is Programme Leader, South West Water; John Harding, is Resources Manager, Biwater Treatment and Steve Roberts is Director, Faber Maunsell.*