Kilve STW

a high impact yet low profile solution

by
Katie Dunmore BSc (Hons), & Paul Thompson BSc (Hons), CEng, MICE

Kilve, a small village on the North Somerset coast approximately 10 miles from Bridgewater, has a connected population of 950. Prior to recent extensions, the effluent was treated by fine screening before discharge through an outfall into the Severn Estuary. The site was identified in the AMP4 programme as one that requires secondary treatment. It was recognised, right at the start of the project, that significant liaison with all stakeholders was a key prerequisite to delivery of a successful solution. An extensive environmental study was undertaken to ensure the most suitable site for the new STW was selected.

Kilve STW Secondary treatment provided *courtesy Wessex Water*

Location

The chosen location, adjacent to the existing headworks, was the most environmentally sustainable as other sites would require significant redevelopment of the headworks site, extensive laying of pipes and the installation of intermediate pumping stations, all of which were deemed too disruptive.

A site at the headworks could be based around the existing facility and, therefore, contained within the one site giving the ability to introduce robust screening. The site was a significant distance from the nearest property, thereby reducing the risk of noise and odour. However, the chosen site was not without constraints - most significantly that the area around Kilve is designated as an Area of Outstanding Natural Beauty.

Architects were commissioned to design the landscaping scheme for the site. An extensive planting scheme was proposed which consisted of appropriate species planting at densities and heights to ensure immediate environmental benefit. When grown. the planting would appear as a small copse, a common feature of the area. The site and surrounds were relatively low in wildlife value and Wessex Water included in the landscape proposal a species rich wildflower meadow between the site and the stream which borders a visitor car park.By so doing Wessex Water was able to demonstrate that. rather than detracting from the natural beauty of the AONB, we had actually enhanced it.

Landscaping of the access track was designed in partnership with the Somerset county archaeologist, and was designed to respect the traditional manorial boundary and rural feel of the area. A programme of archaeological works was also developed in consultation with the Somerset Archaeologist. This involved the digging of archaeological trial pits prior to the construction of the access track and the intermittent monitoring of excavation works at site by undertaking an archaeological watching brief.

The inclusion of the access track and the mitigation measures employed turned into a positive planning benefit as the planners were keen on the idea of separating works traffic from the tourist car park, effectively further concealing the site from public knowledge.

The decision to use a submerged aerated filter (SAF) plant also significantly assisted with keeping visual disturbance in the area to a minimum. The equipment used was small and all machinery was covered. **The majority of the plant was sunk into the ground; in fact the highest treatment unit on the whole site was no higher than 1600mm above ground.** Kiosk's and covers were coloured green and the areas of the site not commonly used were constructed of grasscrete.

The SAF process is known to be low in odours. The sewers feeding the STW area are relatively short and, therefore, unlikely to lead to the development of septic conditions. The inlet pumping station and biological process units are contained under close fitting locked lids to ensure that significant odours cannot escape.

Noise levels from the site were not expected to be significant particularly as the background levels in the area were fairly high due

to the site's proximity to the sea,.Both noise and odour models were presented to the planners in support of the plants low emissions.

As part of the project Wessex Water offered to upgrade a nearby existing public convenience, providing a valuable and enhanced amenity to the public using the area. This was welcomed by West Somerset District Council.

The environmental measures employed to ensure the site be assimilated into the wider landscape and natural beauty of the area directly contributed to the success of the project. Involving all interested environmental and planning parties from the start also proved very valuable in forging good understanding of the developmental need and decision making.

During the construction phase the environmental third party management plan was available and being followed by the site management team. This was further reinforced by the environmental audits which took place every quarter with compliance scores exceeding ninety per cent on each. Furthermore, site staff displayed good environmental practice and were made aware of the various environmental constraints.

Process selection

Process selection was straightforward. Wessex Water has invested in preparation of a number of standard models that are used to determine the process choice and include variables for population numbers, influent and effluent conditions etc. In this instance SAF were chosen. Wessex Engineering and Construction (WECS), Wessex Water's in-house project delivery team, was given responsibility for both the design and construction of the works. This choice meant that the reward of sub-contracts was limited, in this case, to the provision of certain M & E equipment. Using the in-house expertise of WECS minimised the potential for contractual wrangles yet maximised the opportunity for Wessex Water to continue to shape and influence the project during its delivery, responding to new challenges as they arose.

The treatment process incorporated the following items

* 6mm two-dimensional Huber screens;
* primary settlement;
* SAF;
* humus tank;
* tidal pumping station;
* storm tank;
* sludge holding tank;
* generator.

The whole delivery process from selection of the preferred treatment process, through land purchase and to final handover and EA approval, was completed within 18 months, and ensured that the works was compliant well before the regulator's deadline.

For the first time, Wessex Water decided to apply for Considerate Constructors status, Following independent audits of all aspects of the site's impact, the project not only achieved Considerate Contractor status, but also attained a score which placed it in the top 15% of all sites operating under the scheme.

All activities on site, including both those of Wessex Water"s labour force and the work of sub-contractors, were recorded to support WW's aim of outperforming industry standard safety record. During all construction activities - which totalled the equivalent of 40,000 hours of work, there were no lost time or RIDDOR incidents.■

Note:*The Editor & Publishers wish to thank the authors, Katie Dunmore,Environmental Scientist & Paul Thompson, Performance Manager, both with Wessex Water, Engineering & Construction Services, for producing the above article for publication.*