

Lye Oak Pumping Station

membrane filtration system for borehole sites

Lye Oak Pumping Station, situated 6km north east of Dover, Kent, is one of the main sources of drinking water for the supply area of Folkestone & Dover Water Services (FDWS). The rural site is located in a dry valley with meadows of grazing land and adjacent areas of ancient woodland and is a designated area of outstanding natural beauty with neighbouring sites of special scientific interest. The original station sources are three pairs of boreholes, situated approximately 500 metres apart, which feed a central treatment building where the source waters were disinfected prior to supply to the distribution system. The station also boosted water into the local supply area. The station had a history of occasional problems with high turbidity after periods of heavy rainfall which led to FDWS giving an undertaking to the DWI to provide a treatment system to remove micro organisms, including *Cryptosporidia* from the water supply.



Membrane treatment skid (lhs) & UV treatment tubes (RH); module test equipment in foreground (courtesy Vivendi Water Partnership)

A similar undertaking was given for Ottinge Pumping Station which is a chalk well source with similar treatment situated approximately 8 kilometres away and supplies water to a similar part of the company's area.

Lye Oak works

The works comprised of rationalisation of the borehole system by test pumping, followed by new treatment by membrane filtration system, then sterilisation and disinfection using new Ultra Violet (UV) treatment for final water.

The new water plant was project managed by FDWS in-house consultancy *Vivendi Water Partnership* (VWP) who awarded the

works as a design and construct contract with a nominated supplier of the specialist membrane treatment system to be used.

Construction

The Design and Construct contract was awarded to Biwater Treatment Ltd (BTL), with a 52 week contract period. It included a nominated Micro Filtration (MF) Membrane system supplier, which was tendered separately as part of a group wide requirement for membrane treatment at a number of sites (FDWS forms part of a group of companies, including Three Valleys Water and Tendring Hundred water supply companies). The membrane contractor nominated in this particular application for Lye Oak was *Memcor Ltd*, which had advantages over other suppliers due to its much reduced use of chemical washes

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compared to other systems. The Lye Oak site has no connection to main drainage and any waste chemicals have to be tankered off site, the use of *Memcor* MF system made for long term operating savings.

Due to the sensitive environment of the site it was agreed with the local council planning department that the proposed new treatment plant would be constructed with a similar building shape to match the existing and screened by existing banks and new tree planting to minimise any disruptive visual impact.

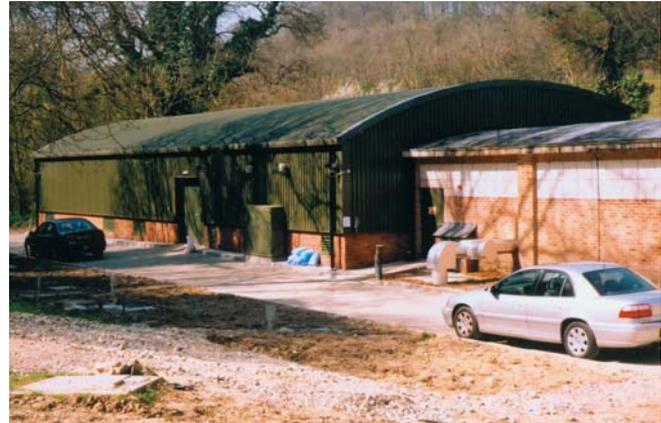
The new treatment plant building and treated water tank basement was designed and constructed by BTL along with modifications to the existing building which had been used to house the new motor and control panels and retained standby generator equipment.

Major items of plant, tanks and skids for the new MF plant were lifted and installed within the new building prior to the roof being completed for ease of access. The main mechanical and electrical works were commenced and completed over the winter of 2001/2, Commissioning works were completed in the spring period with extensive testing and operation of the plant to waste.

The installed plant comprises of three installed borehole pumps, 2 90 module MF skids with associated chemical wash equipment, storage tanks, compressors and air vessels for backwash systems, three installed booster pumps, UV equipment and chlorination treatment.

Output of the works is designed for two stages of 3.5Ml/d and 7 Ml/d, with an additional stage of 10 Ml/d in emergency situations when all standby pump equipment would be used.

The site water sources have not been in use during the majority of the works but were brought back into service during commissioning works for flow to waste and subsequently operating



New treatment building (courtesy Vivendi Water Partnership)

into supply. This has been carried out with the cooperation of the FDWS operational and distribution staff.

Ottinge Ps

A similar contract has been let for the nearby FDWS source at Ottinge PS (3Ml/d) with the same treatment system as Lye Oak. This contract is currently under construction.

Total cost of the Lye Oak project is £2.45 million for the 7 to 10Ml/d plant. ■

Contractors not mentioned in the text included: Hanovia UV Ltd UV treatment; Interface Contracts; Electrical installation; Blackburn Starling - MCC panel manufacturer; Control Systems: FDWS.

***Note:** The Editor and Publishers thank Vivendi Water Partnership for the above article.*
