Mixing specialist SYSTEM MIX LTD has made an important contribution to the operational success and environmental sustainability of Northumbrian Water's advanced anaerobic digestion operations at their Bran Sands, Middlesbrough and Howdon, Newcastle sites in the North East. Following the implementation of the Urban Waste Water Treatment Directive and the subsequent ban on the disposal of sludge to the North Sea, Northumbrian Water (NW) embarked on the construction of what was at the time, the UK's largest thermal sludge drying facility. The project was part of NW TEES strategy to provide centralised treatment for municipal sewage and industrial effluents for the Middlesbrough and Teeside area on a single site at Bran Sands, along with dewatering with lime stabilisation at the Howdon site.

This was a significant project for System Mix, involving the supply and installation of 6 Vaughan HE12 chopper pumps operating on a duty-standby basis mixing 3 x 6000 cubic metre digesters.

The mixers have been operating for 6 years, and as part of Northumbrian Waters recent programme of inspections and modifications to associated pipework, one of the digesters has been emptied and cleaned. The emptying and cleaning process took less than a month and ultimately confirmed a residue remaining of less than 5% of the total digester volume. In terms of the mixing performance this is an excellent example of how the digesters have maintained their working volume to the guaranteed 95% which was required at the tender stage. As a consequence, Northumbrian Water has benefitted from maximised gas production throughout the 6 years of the digesters operation. Furthermore, during this period of operation, the pumps have required only routine maintenance.

The circumstances at NW's Bran Sands operations are a good example of the importance of mixing to the overall operational performance of AD systems and are in marked contrast to other 'retrofit' projects where System Mix has noted a less impressive performance of alternative mixing systems.

For example, digesters operating for only 2 or 3 years and containing 75% of debris by volume, resulting in significant costs for operators because of the need to clean and dispose of residues.

As the sole UK suppliers of the bespoke design ROTAMIX (Digester Mixing) and STM (Small Tank Mixing) tank mixing systems using the integral VAUGHAN chopper pump, System Mix are making an important contribution to the success of AD plants. Operators are benefitting from their technology and experience resulting in their involvement in many 'retrofit' projects where existing mixing systems (or lack of them) were contributing to operational and biological issues.

For example, problems such as solids settlement are commonplace reducing active digester volume and can result in a significant reduction in output, leading to failure of compliance requirements. Also compressors in 'traditional' gas mixing systems and submersible in-tank propeller systems are often associated with labour intensive maintenance issues, resulting in process downtime and associated costs.

Andy Parr, Director at System Mix comments: "Today AD operators need to maximise the sustainable credentials of their plant and equipment even further and we are confident that the benefits of our mixing systems are becoming even more relevant and important, as illustrated by the results of our involvement at NW's Bran Sands site".