



# Suspended Solids Monitoring

## Getting to grips with Mixed Liquor Suspended Solids

CASE STUDY

### PRODUCT

7200 Monitor  
Turbi-Tech2000LA Sensor

### CUSTOMER

Southern Water Services  
Brighton STW

### APPLICATION

Mixed Liquor Suspended Solids

### CUSTOMER OPINION

“We believe that fixed instrumentation that is calibrated on regular basis is the most effective route and we have installed Turbi-Tech 2000's even on the smallest treatment works. In the field of solids and turbidity, Partech are the specialists, which is why we use them.”



Southern Water has recently installed eight new Partech Turbi-Tech 2000LA systems at its East Worthing water treatment works for measuring Mixed Liquor Suspended Solids (MLSS) in the aeration tanks. This new installation takes Partech's Turbi-Tech 2000LA and 7200 Series Monitor a step further in becoming the standard instrument for measuring mixed liquor throughout the whole of Southern Water.

The measurement of MLSS is vital in the control of the activated sludge plant, ensuring that the treatment process is effectively removing pollutants and operating efficiently in terms of aerator usage and chemical dosing. Understanding the trend of the MLSS value enables site operators to change Return Activated Sludge (RAS) and Surplus Activated Sludge (WAS/SAS) rates in response to changing process conditions.

Southern Water has been using Partech's Turbi-Tech 2000LA at a number of wastewater treatment works for several years. Based on the successful performance of these, the company has taken a decision to replace monitors that have proved to be problematical and replace them with the Turbi-Tech 2000LA as part of its Process Compliance Programme.

In older wastewater treatment works, breaking down organic matter is achieved using filter beds. However, aeration is becoming more widely used as technology moves forward. At East Worthing WTW, aeration has been in use for around five years and it has proved to be very effective.

Ask Southern Water why the Turbi-Tech 2000LA and 7200 Monitor have made such a big impact and the answer is very straightforward: “With the Partech Turbi-Tech 2000LA system, setting up is intuitive and once set up the instruments hold their calibration,” says David Manley of the ICA (Instrumentation Control and Automation) department. “Handling mixed liquor should not be a problem, but here at East Worthing WTW where we handle some 31,000m<sup>3</sup> of wastewater a day, we were finding that the original instruments were losing their calibration very quickly, so we turned to the Turbi-Tech 2000LA as it's very easy to calibrate and use. Once calibrated, we know that there will be little drift between calibrations.”

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In order to monitor suspended solids and turbidity, it is essential to employ instrumentation that is calibrated in accordance with Reference Method 2540 Total Suspended Solids (Dried). The Partech Turbi-Tech 2000 operated in conjunction with the Partech 7200 Monitor uses Infrared light that is either scattered or absorbed by the particles in suspension, the amount of received light being proportional to the level of suspended solids. The geometry of the sensor, either light scatter or light attenuation is chosen to suit the suspended solids or turbidity range. The amount of received light is converted into Suspended Solids by the 7200 Monitor using algorithms that have been developed specifically for these applications. The sensor has been designed to cope with the problems of fouling that are inevitably associated with wastewater treatment and also features an integral cleaning mechanism that ensures accurate measurement with little routine operator involvement.

The wastewater entering the WwTWs' aeration lanes comes from the primary settlement tanks and is pumped to the treatment lanes using compressed air. "The objective is to measure the solids in the range 0-5000mg/l solids and we are trying to keep the solids to an optimum for the site", says Dave Manley. "The Partech Turbi-Tech 2000LA and 7200 Monitor, which are linked into a SCADA system, are used for collecting information only and armed with this, the works operators can make manual adjustments to the inflow and outflow of the sludge in order to keep it at its optimum level."

The operators remove the instruments on a weekly basis in order to check that they have not become fouled with debris. Calibration is undertaken once every 6 months by Southern Water's ICA (Instrumentation Control and Automation) Sussex team.

Southern Water is moving towards standardising on Partech's Turbi-Tech 2000LA and 7200 Monitor and the ICA team has an input into the decision making process when it comes to specifying instruments. David Manley gives many reasons why the Partech instrument is their preferred choice: it is easy to set up, easy to calibrate using a single point calibration, the signal does not drift between calibrations and operators like it because of the clear displays are easy to read and the probe can be removed and cleaned very easily.

The design of the Turbi-Tech 2000LA minimises the effects of ragging, which is a distinct advantage when it comes to routine maintenance. In normal operating circumstances, the two glass sensor tubes which take readings extend from the head of the instrument and are only retracted when the automatic cleaning regime kicks in. However, on those sites where fouling is a particular problem Southern Water has programmed the sensors to remain inside the instrument and only emerge when a reading is required. In this way, the potential for dirt to build up on the surfaces of the sensors or to be affected by fouling is greatly reduced. The Partech Turbi-Tech system provides the most effective and reliable solution to monitoring MLSS and David Manley says that the correct positioning and installation of MLSS instruments does have a major influence on performance.

"Partech Instruments are very professional in terms of providing advice and practical guidance when it comes to installing their equipment, which shows that they have a comprehensive appreciation of the treatment process," says David Manley. "We believe that fixed instrumentation that is calibrated on regular basis is the most effective route and we have installed Turbi-Tech 2000's even on the smallest treatment works. In the field of solids and turbidity, Partech are the specialists, which is why we use them."

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