



DYE TRACING WITH CHELSEA FLUORIMETERS



Chelsea Technologies Group has been providing fluorimeters, under both purchase & hire arrangements, to surveying companies for many years. Traditional applications have been time & travel studies of rivers, the main contractor principally being the Environment Agency of England & Wales.

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Recently, **Dynamco Limited** (Haywards Heath, UK) has deployed equipment to conduct dye tracing experiments in rivers. This work, carried out on behalf of **South East Water** and the **Environment Agency**, required the installation of self-powered AQUA^{packs} (the on-board fluorimeter configured for detection of Rhodamine WT) at specific points along the river.

Surveying companies have also used these fluorimeters for other interesting applications. **Webs Ltd** (Banbury, UK), has hired both MINI^{tracka} II's and AQUA^{packs} for the detection of Rhodamine WT dye in the range 0 to 10 ug/l. The instruments were used as part of a performance test, investigating the mixing in new or refurbished anoxic zone tanks in activated sludge plants with the aim of providing satisfactory retention and mixing. The test is conducted by injecting a known quantity of Rhodamine WT dye into the inlet of the tank and monitoring the Rhodamine WT concentration in the water as it exits. The data collected by the AQUA^{packs} or MINI^{trackas} is used together with other information obtained during the test to calculate the dead volume, any short circuiting and the average retention time in the tank.

Philip Mackey Associates (PMA) (Solihull, UK), a regular user of Chelsea fluorimeters, has also recently used these systems for diverse applications including dye tracing work for the **East Midlands International Airport EMAP 2000** Project. In order to control surface water runoff, the Airport constructed two sophisticated surface water balancing systems. The runoff is controlled to regulate downstream discharges, including the pollution control of de-icers and other associated chemicals. The Rhodamine WT and fluorimeter techniques have been used to trace the path of surface water runoff, and assess the competence of the lining to catchment ponds and groundwater movement. The latter forms part of the environmental risk assessment procedure.

Other recent fluorimeter based projects undertaken by **PMA** include work conducted at a **Power Station in Andrah Pradesh, India**, on a 0.75 sq km lined reservoir in the coastal strip. The Rhodamine WT technique was used for quality and warranty checking of the artificial membrane liner. In addition, Rhodamine WT has been used for checking the cone of depression and influence of the site under drainage system, in evaluating hydrogeology of groundwater movement, and efficiency of the drainage system, and effect of tidal influences.

PMA has also utilised these systems for monitoring the effect of mining operations, which were carried out adjacent to a major reservoir constructed on the Nottinghamshire Triassic sandstones (UK), and immediately next to a major Victorian surface water culvert. Leakage from either or both of the above is capable of causing damage and structural distress from flooding downstream. Fissures were reported, and Rhodamine WT technique used (independently) to dose the reservoir and culvert, in order to check for leakage, hydraulic continuity, or responses in local water courses and drainage audits.

The Chelsea Technologies Group offer instrumentation for dye tracing which is both robust and reliable. With many years of experience in this field, Chelsea Technologies can provide advice on your particular application. In addition to the hire service, Chelsea Technologies can offer complete systems for purchase, which regularly prove cost effective for medium to long term requirements.