

The University of New South Wales

Optimising dissolved air flotation (DAF) for algae removal by bubble modification in drinking water and advanced wastewater systems

A PhD scholarship is available via an ARC Linkage Grant (2009-2012) to investigate a novel adaptation to the dissolved air flotation (DAF) process to enhance algae removal in both drinking water and advanced wastewater treatment systems. Algal and cyanobacteria blooms are of particular concern in drinking water resources due to their negative impact on treatment processes, as well as their potential to release harmful toxins into water supplies and impact on taste and odour quality of drinking water. Waste stabilisation ponds used for the advanced treatment of wastewater are also highly susceptible to algal activity which can limit recycled water production. DAF is commonly employed for algae removal but often times with only limited success.

The intended outcome of this research is the delivery of a modified-DAF process offering a more robust, sustainable and economical barrier to algae by increasing algal cell removal efficiency while decreasing chemical consumption and sludge production. Traditionally, DAF is preceded by coagulation/flocculation in which chemical modification of the algal cell surface and associated organic matter leads to agglomeration of colloidal and dissolved matter to form a floc that is more easily floated. The modification will remove the requirement for the preliminary coagulation/flocculation stage by developing a novel polymer that will functionalise the surface of the bubbles generated in DAF such that they are attractive to algae and associated dissolved organic material. This project will not only deliver improvements to current practise for algae removal but will also make significant contributions to knowledge in the field of flotation science.

This project will be undertaken in the UNSW Water Research Centre within the School of Civil and Environmental Engineering and there will be substantial collaboration with the Bio/Polymers Research Group within the School of Biotechnology and Biomolecular Sciences.

The suitable candidate will have a background in either chemistry, environmental and/or chemical engineering or biotechnology. The candidate should have a demonstrated aptitude for undertaking laboratory work and an understanding of water treatment technologies.

A scholarship is available to Australian citizens and to those holding permanent residency (PR) status for a period of up to three years. Stipends of up to \$30,000 per annum (tax free) will be provided for three years.

Further information on the project and scholarship on offer may be obtained from **Dr Rita Henderson** r.henderson@unsw.edu.au. Applications for the scholarships (including a cover letter, academic transcript and CV) should be submitted to Dr Henderson, UNSW Water Research Centre, University of New South Wales, Sydney NSW 2052.