

## NatVal 2.2 – Sub-project 3 Development of Validation Protocols for Activated Sludge Processes in Water Recycling



### Lead organisation

CSIRO

Land and Water

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### Sub-project summary

The treatment of recycled water, in particular water originating from sewage effluent, often incorporates some form of biological treatment as one of the treatment steps. The biological systems are commonly part of an existing wastewater treatment plant and become incorporated into the treatment system for the recycled water. Biological systems are usually not individually validated as an active treatment barrier beyond the use of the data provided in the *Australian Guidelines for Water Recycling*. This is because of the existing complexities and knowledge gaps relating to contaminant removal by biological systems in Australia and the lack of accepted, standardised validation tools and methods. The expected outcomes of this project will be:

- a validation protocol applicable to biological systems in different regions of Australia for the efficient removal of pathogens and able to deal with changes based on seasonal and event based impacts
- a determination on which physical parameters can be used to as indirect ongoing validation tools for pathogens removal in biological systems.

The validation protocol will be developed through the testing of a number of municipal activated sludge plants located in different geographical and climatic regions of Australia. Where possible these plants will also be associated with existing water reuse schemes. These plants will be tested against a draft validation protocol established using existing national and international data obtained from discussions with water utilities and information in the scientific and grey literature. Testing will involve determining the removal of target microorganisms across the activated sludge plants and comparing these removal rates against a range of water quality parameters, especially those that can be measured using online sensors. The outcomes of this testing will be used to refine the draft validation protocol. This revised protocol will then be trialled on smaller, regional biological treatment plants which can be expected to be a greater risk for having a higher variation in the ability to remove pathogens, as they can be subject to greater variations in flow and other perturbations, and are often remotely operated.

Following the testing on the regional biological treatment plants, the validation protocol will be further refined before being incorporated in the overall risk framework developed from the outcomes of the entire NatVal project.

### Participants

CSIRO

WA Water Corporation (WC)

SouthEast Water (SEW)