

SunWater
Hydraulics
Laboratory





SunWater Hydraulics Laboratory



The SunWater Hydraulics Laboratory at Rocklea makes available extensive resources and skilled staff to help ensure the success of your project. Forming part of SunWater's project management services, the laboratory facilities enable detailed physical modelling of hydraulic structures, allowing clients to test scale models before their projects commence full-scale construction.

SunWater's laboratory staff specialise in testing hydraulic structures such as spillways, energy dissipaters, tidal barrages and weirs, storm drainage structures, pump station intakes, irrigation control structures and conduits.

Typical examples of work completed to date, include studies and/or designs of:

- Spillway design and performance;
- Spillway energy dissipaters;
- Intake and outlet works;
- Tidal barrages and weirs;
- Pump station intakes;
- Siphon structures;
- Diversion channels; and
- Fishway design and flow requirements.

Hydraulic Model Testing

The use of scale models of engineering structures is a well-established technique in testing and optimising hydraulic design.

Undesirable flows can occur in non-standard and complex designs, and it is difficult to predict their effects with certainty using theory alone. Each project has its own particular deviation from standard practice. It is therefore necessary to prove the design before construction commences.

Physical modelling provides greater hydraulic efficiency, improved safety and reliability, and lower construction costs.



Laboratory Facilities

SunWater's Hydraulic Laboratory has been operational since 1977 and is well equipped to meet a wide range of modelling requirements.

The laboratory has an indoor area of 800m² and utilises a recirculating water supply system with an installed capacity of 450 l/s. A tilting flume is available with a 4m long, 450mm square working section and transparent sides.



Laboratory instrumentation is capable of measuring flows, water levels and velocities, and static and fluctuating pressures. Cameras are available for still photography and video recording of model behaviour. Laboratory facilities provide for moulding, machining and fabrication in timber, acrylic, metals and other materials for instrumentation and hydraulic models.



The laboratory is equipped to undertake two and three dimensional hydraulic studies. Two dimensional models are normally constructed in the tilting flume, whilst three dimensional models are contained within bays designed to suit the particular investigation.



Typical examples of studies include:

- Spillway layout and performance - discharge ratings, approach conditions, design loadings, turbulence, gate performance and overall behaviour;
- Spillway energy dissipators - turbulence, energy dissipation, scour and design loadings;
- Intake and outlet works - discharge ratings, turbulence, energy dissipation, regulating valve behaviour, gate loads and vibration characteristics;
- Tidal barrages and weirs - discharge ratings, turbulence, energy dissipation, scour, bank protection and design loadings;
- Pump station intake - layout, swirl and air entraining vortex behaviour and sedimentation;
- Siphon structure - air entrainment mechanism, turbulence, energy dissipation and discharge capacity;
- Diversion channels - discharge capacity, scour and protection for diversion during construction of a major embankment; and
- Fish ladders and locks - overall behaviour, flow conditions and turbulence.

The laboratory can undertake total studies or, alternatively, provide the facilities and staff to build and operate the model under the direction of the client's project engineer. SunWater's technical staff can also provide support if required. The laboratory has developed Quality Assurance Procedures as part of the Quality Assurance System adopted by SunWater. The Hydraulics Laboratory is proud of its reputation for responding to its clients' needs with an appropriate, cost-effective and professional service.

Modelling Experience

Major studies have been performed for both SunWater and external clients.

Examples of SunWater projects studied at the laboratory include:

- Wivenhoe Dam
- Boondooma Dam
- Burdekin Falls Dam
- Bjelke-Petersen Dam
- Mary River Tidal Barrage
- Mirani Weir
- Bucca Weir
- Claude Wharton Weir
- Peter Faust Dam
- Haughton Pump Station Intakes
- Kroombit Dam
- Walla Weir
- Peter Faust
- Borumba Dam
- Teemburra Dam

Examples of external client projects studied at the laboratory include:

- Wyaralong Dam
- Cethana Dam
- Baroon Pocket Dam
- Todd River Dam
- Burton Gorge Dam
- Theresa Creek Dam
- Lenthalls Dam
- Copperfield Dam
- Eildon Dam
- Paradise Dam
- Hinze Dam
- Coomera River Bridges

For more information

For further information about the laboratory and the services offered contact:

SunWater Limited

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SunWater Hydraulics Laboratory

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Clients

Any organisation undertaking construction of hydraulic structures should consider model testing. SunWater's Hydraulics Laboratory is available for use by government departments, consulting engineers, local authorities and private sector organisations.

Previous clients who have benefited from SunWater's hydraulic modelling service include:

- Cameron McNamara Pty Ltd
- Gutteridge Haskins and Davey Pty Ltd
- John Wilson and Partners
- Logan City Council
- Munro-Johnson and Associates
- McIntyre and Associates
- Connell Wagner (Qld) Pty Ltd
- Ullman and Nolan Pty Ltd
- Mount Isa Mines
- Queensland Rail
- Southern Cross Pumps
- Goulburn Murray Water
- Queensland Water Infrastructure
- Gold Coast City Council / Seqwater

