

# Singapore's Marina Barrage and Reservoir in the City

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The completion of the Marina Barrage in 2008 is an important milestone in the Singapore water story. The Marina Barrage, located in the southern part of Singapore, is an innovative and cost-effective engineering solution to meet Singapore's needs for water supply, while providing flood control and recreational possibilities. This new-age reservoir is dubbed Reservoir in the City, simply because it has ventured into an area of water management where few have dared to go. Reservoirs are typically created in areas away from the population where the water can be kept pristine. However, here is a reservoir which collects its water from the most urbanized parts of Singapore – from residential heartlands to commercial and industrial districts.

The Marina Barrage and Reservoir is the culmination of creative, visionary thinking as well as decades of planning and hard work. It underscores the importance of keeping our land and waters clean, which remains relevant as we seek to keep the water in the Marina catchment clean for aesthetic, recreational and water supply purposes. Efforts began more than 30 years ago, when then Prime Minister Lee Kuan Yew set a challenge to the Environment Ministry to clean up the Singapore River. It was a massive task. The authorities had to resettle farms and squatters, and relocate polluting industries. With the strong commitment of the government, by 1987 the river was clean enough for fish to return. In the same year, then Prime Minister Lee issued another challenge – to dam up the mouth of the Marina channel to create a freshwater lake.

Over the years Singapore have studied overseas facilities, experimented with the science and built up strong water-treatment capabilities. With the progress of membrane technology, we can now treat the reservoir water to drinking water standards in a reliable and cost effective way. Since 2005, PUB has also embarked on an Integrated Catchment Water Quality Management (ICWQM) Programme to manage water quality of the Marina Reservoir and catchment. The main aim of these programmes is to ensure that water quality in the reservoir will be safe and aesthetically pleasing for the many users of the reservoir. The ICWQM Programme is made up of four key strategies namely source control, mitigation measures, use of technology; and engaging the public through 3P initiatives. Today, the vision of creating a freshwater lake behind the Marina Barrage has become a reality.



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## **Creating Connection**

As a public infrastructure project, the Marina Barrage breaks previous mindsets with its openness. To prevent people from straying in, these public facilities are usually fenced up. Marina Barrage, however, breaks new ground. It has no entrance and no exit, blending seamlessly with the surroundings.

The Marina Barrage brings the community closer to water as they bond with it through various water activities such as boating and kayaking. The belief, proven by PUB's earlier research, is that people who play in or live near water are more likely to cherish it. This nurturing of ownership of our precious water resource is a long-term pillar of Singapore's water sustainability efforts. Within the building, the Sustainable Singapore Gallery was designed to connect people with the past and to the future of Singapore's water story. So younger generations understand the road Singapore has taken to achieve self-sufficiency in water and what it takes to sustain the environment.

Architecturally, the building is designed to complement this solid engineering structure. Using materials such as raw concrete finish and stainless steel, together with glass and cladding, the finishes are managed in its variety, properties and colours. As a showpiece of environmental sustainability, the design, construction and operations of the Marina Barrage are based on green principles.

As the first reservoir built in Singapore in this millennium, the Marina Reservoir was designed to be a new age reservoir. Although dubbed a "3-in-1 project", PUB has designed Marina Barrage to bring about more than its promised triple benefits of creating a new water supply, a flood control mechanism and a hotspot for water activities.