

# Warragamba Dam Raising Project

How will the dam change?

Fact Sheet



## About Warragamba Dam

Warragamba Dam is a water supply dam and provides around 80 percent of Sydney's water supply. The dam was constructed between 1948 and 1960, and is 142 metres high and 350 metres wide. It is currently not designed or operated for flood mitigation.

Warragamba Dam has two spillways:

- the central spillway is 90 metres wide with gates
- the auxiliary spillway is 180 metres wide on the right of the central spillway

Warragamba Dam is a mass gravity concrete dam which means the weight of the wall anchors the dam and allows it to hold back the water behind the wall.

## Designing the dam raising

The proposed Warragamba Dam Raising Project (the Project) involves raising the height and increasing the thickness of the dam with new concrete creating a flood mitigation zone' to temporarily hold back inflows. This would reduce the frequency and extent of major floods in the Hawkesbury-Nepean Valley downstream. The permanent water supply level would not change.

Over 80 dams in Australia have been raised at some point after their original construction. There have been higher raisings of concrete mass gravity dams globally, the highest being the Guri Dam in Venezuela which was successfully raised in the 1980s from 106 metres to 162 metres – a raising of 56 metres. In 2015, the San Vicente Dam in California – a similar dam to Warragamba Dam – was raised by 36 metres to 102 metres.

Some of the key aspects of the design are summarised below:

- strict regulations control construction and modification of dams to ensure safety
- the dam raising design has been developed by specialist engineers from Australia and overseas
- the concept design addresses the requirements of Dams Safety NSW which regulates large dams in NSW. These regulations align with national and international design guidelines
- an independent technical peer review panel, experienced in the investigation and design of large dams, ensured the design meets international best practice
- the design team used sophisticated digital design tools to develop a design to safely raise the dam
- to test the concept design, the team built a physical scale model of the proposed dam. This scale model was used to run a series of simulated flood events to test the physical results against those forecast from the computer modelling
- extensive investigation of the dam foundations, existing concrete and testing of proposed concrete materials has been undertaken

## What is proposed?

The design for the dam raising must consider the spillway crest levels and outlets that will control the extent and duration of the temporary upstream inundation and will be changed as follows:

- raising the level of the central spillway crest by around 12 metres and the auxiliary spillway crest by around 14 metres above the existing full supply level to temporarily store inflows
- raising the dam side walls (abutments), including dam access road by up to 17 metres providing resilience for future impacts to projected climate change

The Project would include the following main activities and elements:

- demolition or removal of parts of the existing Warragamba Dam, including the existing drum and radial gates, to allow for the new works
- thickening and raising of the dam abutments
- thickening and raising of the central spillway
- new gates or openings for release of water from the flood mitigation zone
- modifications to the auxiliary spillway
- other infrastructure and elements including new roads, bridges and ancillary facilities
- environmental flows infrastructure

The two figures below show views of the Warragamba Dam (artist impression) after construction of the Project.





Artist's impression of raised Warragamba Dam looking from the upstream side

Project construction is expected to be completed about five years from commencement.

### Infrastructure for environmental flows

Environmental flows are releases of water from dams to help protect and improve downstream river health in non-flood conditions. Variable environmental flows aim to mimic the natural flow conditions in the river system.

Warragamba Dam wall needs to be modified to release variable environmental flows. For cost efficiency the dam raising concept design has included the infrastructure needed to allow the release of these flows from the dam.

Although designed in parallel with the dam raising concept design, the Warragamba Environmental Flows Project has been approved separately by the NSW Government as part of the long-term program to improve the health of rivers impacted by Greater Sydney's dams. Release of environmental flows will not occur during a flood event.

For further details on the project design and construction see Chapter 5 of the EIS.

### Ask a Question

Visit the project portal and virtual engagement room: [www.waternsw.com.au/wdr](http://www.waternsw.com.au/wdr)

**Free call:** 1800 932 066

**Email:** [wdr@waternsw.com.au](mailto:wdr@waternsw.com.au)



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