Warragamba Dam Raising Project

Why raise Warragamba Dam?

Fact Sheet

Raised dam arrangement shown is based on current concept design.

Flooding in the Hawkesbury-Nepean Valley

The high flood risk in the Hawkesbury-Nepean Valley arises because floodwaters from five major tributaries flow into one river system which is constrained by narrow downstream gorges.

This unique geography causes floodwaters to back up across deep and broad floodplains across the valley – known as the 'bathtub' effect.

The floodplain is home to a large existing population potentially impacted during flooding. Around 140,000 people currently live or work in the floodplain.

It is this combination of flood likelihood and exposure of a large population that makes the risk so high.

The large Warragamba catchment

The Warragamba Dam catchment stretches for over 9,000 square kilometres, beyond Lithgow in the west, and Goulburn in the south.

All the most damaging and dangerous floods in the Hawkesbury-Nepean include a significant contribution of floodwaters from this large catchment, historically up to 70 percent. Further floodwaters can also come from the Nepean River, the Grose River, South Creek and other tributaries.

For example, the Warragamba catchment contributed around 60 percent of inflows to the March 2021 flood. Inflows from all the other catchments combined contributed around 40 percent.

Hawkesbury-Nepean Valley Flood Risk Management Strategy

The NSW Government's Flood Strategy for the Hawkesbury-Nepean is delivering nine integrated outcomes to reduce the high flood risk. Outcome 2 is the proposed raising of Warragamba Dam for flood mitigation. WaterNSW, as the dam owner and operator, has prepared the Environmental Impact Statement (EIS) and concept designs for the proposed dam raising.

Recent analysis to inform the EIS confirmed earlier findings that the proposed dam raising is the most effective infrastructure option to reduce regional flood risk.

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March 2021 Hawkesbury-Nepean flood at Windsor

What alternatives were considered?

The Flood Strategy confirmed there is no simple solution to reduce the significant flood risk. A mix of actions is needed now and for the future.

Infrastructure alternatives can significantly reduce flood risk by lowering the chance of a flood, reducing the exposure of homes and business to floodwaters, and by increasing the certainty of time for evacuation.

A broad range of alternatives was assessed, including:

- new dams
- altering Warragamba Dam
- dredging the Hawkesbury River
- constructing river bypass channels
- local levees
- major regional road upgrades
- buying back homes in the floodplain

The assessment of the alternatives and options confirmed that, of all the risk-reducing options considered, creating a flood mitigation zone at Warragamba Dam offers the most benefit to downstream communities in reducing flood risk.

Benefits of the dam raising

The March 2021 Hawkesbury-Nepean flood ranged from minor to major across the floodplain. It had a likelihood of around 1 in 10 to 20 chance in a year (or about a 98% chance in an 80-year lifetime). The image below shows the extent of flooding over Windsor in March 2021.

Modelling has shown that the dam raising would have significantly reduced the March 2021 flood level - by around 3.5 metres at Windsor and five metres at Penrith.

However, the dam raising would have greater benefits for the larger, more dangerous and damaging floods. Along with reducing risk to life, the figure below highlights the benefits of the dam raising for some of the larger floods.

Reducing risk with a flood mitigation zone

Two options for lowering the full supply level were investigated – 5 metres and 12 metres.

Compared to the dam raising, lowering the full supply level by 12 metres would provide less than half the flood mitigation benefits for large events similar to the flood of record in the valley.

Lowering the full supply level by 12 metres would also require modifications to the dam wall to allow the inflows to be released in a timely way.

Lowering the full supply level by 5 metres would have very limited benefits for reducing risks from most dangerous and damaging floods.

A 'V' shaped valley

The deep 'V' shape of the valley upstream of Warragamba Dam means the inflows held and the benefits gained from raising Warragamba Dam (including protection of Sydney's water supply) are much greater than options to lower the full supply level.

The full supply level would need to be lowered by 25 metres to provide the same benefit as the Project.

Drinking water security for Greater Sydney

Warragamba Dam provides around 80% of Greater Sydney's water supply.

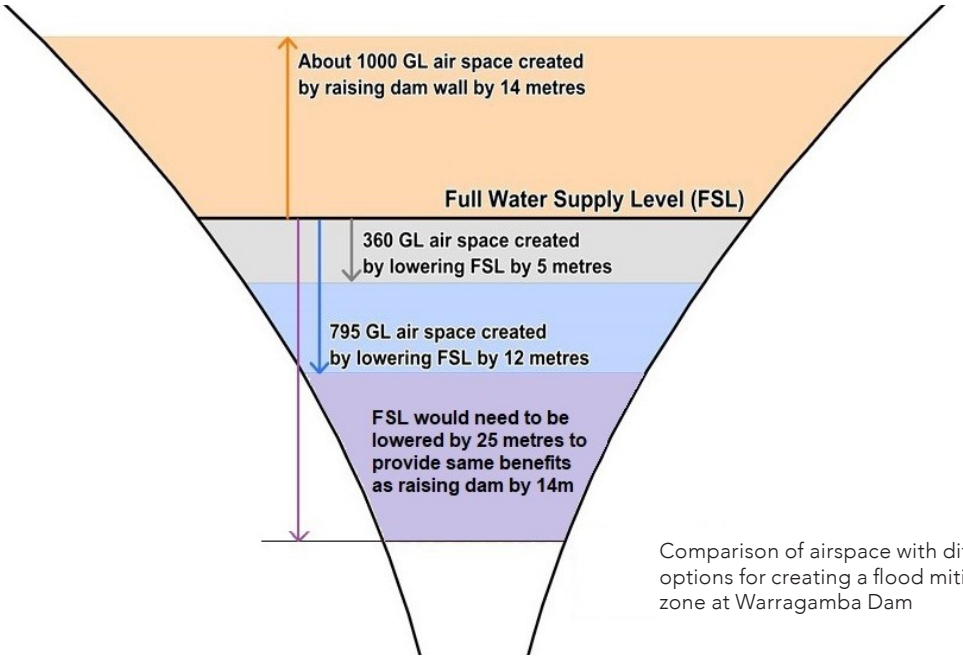
If the dam full supply level was lowered for flood mitigation, a major augmentation to the water supply system would be required at significant cost.

A broad range of alternatives were assessed, including:

- if the level was dropped by 12 metres, the dam would lose almost 40% of its water storage capacity
- if the level was dropped by 25 metres – to provide the same risk reduction benefit as raising the dam – water storage capacity in the dam would be reduced by 67%, or more than half of Greater Sydney's water supply

For detail on the assessment of alternative flood mitigation options, see Chapter 4 of the EIS.

For more information on the Flood Strategy for the Hawkesbury-Nepean Valley, visit the Infrastructure NSW website at: www.insw.com/flood-strategy



Comparison of airspace with different options for creating a flood mitigation zone at Warragamba Dam

Ask a Question

Visit the project portal and virtual engagement room: www.waternsw.com.au/wdr

Free call: 1800 932 066
Email: wdr@waternsw.com.au

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