



Resilient Valley, Resilient Communities

Hawkesbury–Nepean Valley Flood Risk Management Strategy

Frequently asked questions



Why raise Warragamba Dam?

Why is the flood risk so high in the Hawkesbury-Nepean Valley?

The high flood risk in the Hawkesbury-Nepean Valley arises because floodwaters from 5 major tributaries flow into 1 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.

What role does Warragamba Dam play in a flood?

The large Warragamba Dam catchment stretches 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%. 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% of inflows to the March 2021 flood. Inflows from all the other catchments combined contributed around 40%.

The *Resilient Valley, Resilient Communities* Flood Strategy for the Hawkesbury-Nepean is delivering 9 integrated outcomes, including preparing the Environmental Impact Statement (EIS) and concept designs for the proposed raising of Warragamba Dam for flood mitigation.

Analysis to Inform the Warragamba Dam Raising EIS confirmed earlier findings that the proposed dam raising is the most effective infrastructure option to reduce regional flood risk.

What flood mitigation options have been assessed?

The Flood Strategy confirmed there is no simple solution to reduce the flood risk. A mix of actions is needed. Infrastructure options 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 options 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.

How would the risk be reduced at Warragamba Dam?

The assessment of options included ways to reduce flood risk by creating a flood mitigation zone at Warragamba Dam to temporarily hold back floodwaters. Two ways to achieve this were assessed:

- raise the dam wall by around 14m
- permanently lower the dam’s full supply level - by either 5m or 12m.

The deep ‘V’ shape of the valley upstream of Warragamba Dam means the floodwaters held and the benefits gained from raising Warragamba Dam by around 14m (including protection of Sydney's water supply) are much greater than options to lower the full supply level.

Compared to the 14-m raising, lowering the water supply level by 12m would provide less than half the flood mitigation benefits for large events similar to the flood of record in the valley. It would also require modifications to the dam wall to allow the floodwaters to be released in a timely way. Lowering the water supply level by 5m would have limited benefits for reducing risks from most dangerous and damaging floods.

What are the benefits of the proposed 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 of happening (or about a 98% chance in an 80-year lifetime).

The dam raising would have significantly reduced the March 2021 flood level - by around 3.5m at Windsor and around 5m 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 figures below highlight the benefits of the proposed dam raising in larger floods.

- 1 in 100 chance per year flood (similar to Brisbane 2011 flood)



People to evacuate
Reduced from
55,000 to 14,000



Homes impacted
Reduced from
7,600 to 2,500



Damages
Reduced from
\$3 billion to \$0.4 billion

- 1 in 500 chance per year flood (similar to 1867 flood of record)



People to evacuate
Reduced from
90,000 to 45,000



Homes impacted
Reduced from
15,500 to 5,000



Damages
Reduced from
~\$8 billion to ~\$2 billion

Would there be any impacts on Sydney's water supply?

Warragamba Dam provides around 80% of Greater Sydney’s water supply. The proposed dam raising would not change the water supply available.

Projected population growth means the city’s water supply is now at its sustainable limits. If the dam full supply level was lowered for flood mitigation, a major augmentation to the water supply system would be required.

- If the full supply level was dropped by 5m, the dam would lose around 18% of its water storage capacity.
- If the level was dropped by 12m, the dam would lose almost 40% of its storage capacity.
- To provide the same risk reduction as raising the dam by around 14m, the dam’s supply level would need to be lowered around 25m – reducing its capacity by 67%, or more than half of Greater Sydney’s water supply.



For more information about flooding in the Hawkesbury-Nepean Valley, visit www.myfloodrisk.nsw.gov.au
For more information about the Flood Strategy, visit www.insw.com/flood-strategy