



SEAHAM WEIR REFURBISHMENT AND MODIFICATION PROJECT

HUNTER WATER IS UPGRADING SEAHAM WEIR TO COMPLY WITH NEW REQUIREMENTS FOR FLOW CONTROL AND FISH PASSAGE



Located on the lower Williams River, Seaham Weir is a key component of the Grahamstown Dam scheme which provides 40% of the drinking water used by Hunter Water customers.

Seaham Weir provides a barrier between fresh water flowing down the Williams River and the salt water estuary, thereby enabling Hunter Water to harvest fresh water for Grahamstown Dam.

What does this project involve?

Seaham Weir consists of a rock weir, a concrete spillway, flow control gates and a fishway.

Built in 1967, Seaham Weir is now in need of redesign and modification to meet environmental outcomes which were not considered when the Weir was constructed. The design for the new structure has been developed and the project is scheduled for completion in 2022.

The project will involve construction of four three-metre overshot gates on the south-east

bank of the river, adjacent to a new 'vertical slot' fishway (fish ladder).

How does the Weir currently function?

Seaham Weir is managed in accordance with strict operating rules that specify target upstream water levels depending upon River flow rates.

Water flows past the Weir in three ways:

1. water flows over the Weir during flooding and high river flows (uncontrolled flows)
2. water is released under two large flow control gates when they are opened
3. water continually moves through the fishway.

The flow control gates are operated to control the Weir pool level and prevent salt water intrusion. The gates are opened during flood events, to allow flushing and to release environmental flows. The gates are closed irrespective of flows when the tide level exceeds the upstream water levels.

Existing flow control ability

The existing gates are an older-style 'undershot' design. They are only able to provide coarse flow control because they must be either fully opened or fully closed, and are not suitable for partial opening to provide a lower flow rate.

Existing fish passage

Compared to newer designs, the existing fishway is not effective. Fishway designs have improved greatly since 1967 when the existing fishway was constructed.

To enable fish to travel upstream it is necessary to have a well-designed fishway, and also to provide freshwater releases, known as 'attraction flows', through the flow control gates located next to the fishway. The existing gates at Seaham Weir, because they are only able to provide large volume releases and 'pulses', are not able to provide continual low-volume 'attraction flows'. Fish travelling downstream need to cross the flow control gates, however the existing gates do not facilitate downstream fish travel as they are closed most of the time.

Why is this project needed?

The Lower Hunter Water Plan (LHWP) was developed in 2014 in consultation with Hunter Water, community members and other stakeholders. The LHWP sets out measures to ensure there is enough water to supply the needs of the Hunter Region and the environment.

To meet the requirements of the 2014 LHWP, modifications to Seaham Weir need to be made to:

- improve flow control; especially to improve releases of water in low flow conditions, and to provide flows similar to a river's natural flow
- improve fish passage both upstream via the fishway and downstream using the flow control gates, and provide attraction flows.

Weir pool depth

An objective of the project is to maintain the Weir pool level within the current range. This will minimise changes to the River's banks and ecosystems and impacts to properties upstream of the Weir.

Improved fish passage

A modern style vertical slot fishway, together with 'attraction flows', will greatly improve fish passage upstream across the Weir over a much wider range of river flows.

The new flow control gates will allow improved flow control and also enable fish to travel downstream through the gates.

Improved flow control

Four new three-metre wide overshot gates will be constructed. One or more of these gates can be lowered to release the required amount of water, greatly improving flow control.

The new gates will also manage the Weir pool level and assist fish passage downstream. The gates will be closed, irrespective of river flows, when the tide level exceeds the upstream water level to prevent salt water flowing upstream into the Weir pool.

Construction of the new flow control gates will enable Seaham Weir to meet its new environmental requirements by better management of fresh water releases subject to water restrictions and Weir pool levels. The proposed water releases include:

- Release a 500ML 'fresh' environmental flow approximately once per year
- Provide 'translucent releases'* (based on river flow measured from Glen Martin) according to the following rules:
 - release 30% when no water restrictions apply
 - release 20% when moderate restrictions (Level 1 and 2 as defined in the 2014 LHWP) apply
 - release 10% when severe restrictions (Level 3 and 4 as defined in the 2014 LHWP) apply
- Provide a 20ML/day transparent release** (relative to river flow at Glen Martin), while maintaining Weir pool levels within current range.

* A translucent release is a continuous release that is a specified proportion of inflow.

** A transparent release is a continuous release equal to inflow up to a specified maximum.

For more information

Visit www.hunterwater.com.au/seahamweir
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