

innovation

technology

sustainability

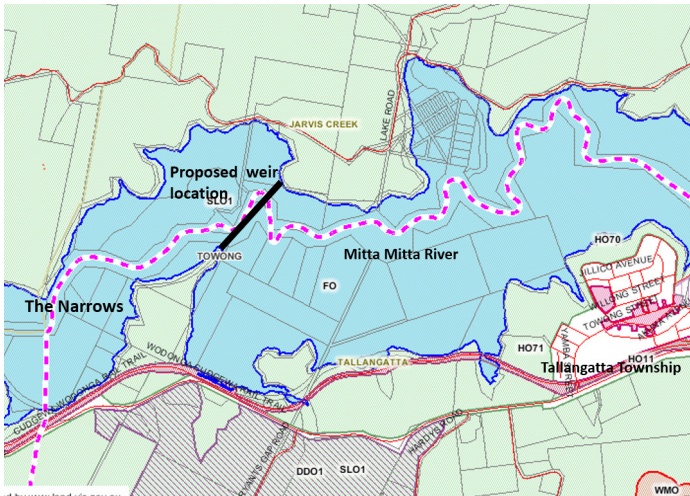


Purpose of The Narrows Project

The purpose of a weir at The Narrows (3km west of Tallangatta) would be primarily to deliver more consistent water levels at Tallangatta over peak tourist season to provide recreation, tourism and other benefits to the town.

Key points

- Towong Shire Council is undertaking a comprehensive "once-and-for-all" Feasibility Assessment of The Narrows Project with input from leading experts in dam engineering, economic analysis and other disciplines.
- Current estimates are that the cost of building and maintaining The Narrows Project would be high - higher than estimates from previous studies.
- Benefits have been assessed in the areas of increased recreational use of Lake Hume, residential housing growth, higher tourism demand and additional road access across Lake Hume.
- Towong Shire Council is seeking community feedback about the Feasibility Assessment to ensure all relevant information is considered.
- Community feedback will be considered by a Project Steering Group in preparing advice to the Victorian Government. The Victorian Government will decide whether additional studies are required.



Location of the Narrows

Source: <http://services.land.vic.gov.au/maps/pmo.jsp>

The Narrows Project Feasibility Assessment

The idea of a weir at “The Narrows” has been the subject of discussion in the Tallangatta community for many years. In response to this Towong Shire Council is undertaking a comprehensive “once-and-for-all” Feasibility Assessment of The Narrows Project supported by Victorian Government funding. This work is also considering earlier studies. The Feasibility Assessment has drawn on leading technical experts in dam engineering, economic analysis and other disciplines. This Feasibility Assessment is the first time all relevant government agencies have worked together to provide a comprehensive study. This cooperation is occurring through a Project Steering Group with the following membership: Goulburn-Murray Water, Murray Darling Basin Authority, North East Catchment Management Authority, North East Water, Regional Development Victoria and Towong Shire Council.

Community Input

Towong Shire Council is seeking community input to inform the Feasibility Assessment to ensure all relevant information is considered. Community input will be considered by the Project Steering Group in preparing advice to the Victorian Government. The Victorian Government will decide whether additional studies are required.

The scale and complexity of The Narrows Project

The work to date has highlighted that The Narrows Project would be a complex project with much higher capital costs than estimated in previous studies. This is because the current study has been very comprehensive and includes all costs including water evaporation losses. There have been changes over time regarding material and construction costs, and water allocations and pricing. More stringent environmental requirements have also been introduced (e.g. the need for a fish ladder) and construction requirements for weirs have become more stringent to maximise safety.

Developing a business case for The Narrows Project

A strong business case would need to be established for The Narrows Project to be funded i.e. for the benefits to justify the expenditure required. An economic assessment has identified an increase in tourism demand, residential development and population growth as the key economic benefits. However, the current assessment suggests that these benefits do not outweigh the high capital cost, water evaporation losses, and ongoing operational and maintenance costs of The Narrows Project. For a strong business case to be established the estimate of economic impacts of the Project would need to be well above current estimates.

Design objectives

The general design objectives for The Narrows Project are:

1. To maintain consistent water levels in Lake Hume at Tallangatta over the peak tourist season to encourage recreational activities including boating, water skiing, and fishing
2. To provide improved water frontage and amenity in the vicinity of the Tallangatta township
3. To provide an alternative road access to the north side of the Mitta Mitta Arm to the west of Tallangatta.

Functional criteria

The Narrows weir would need to perform the following functions:

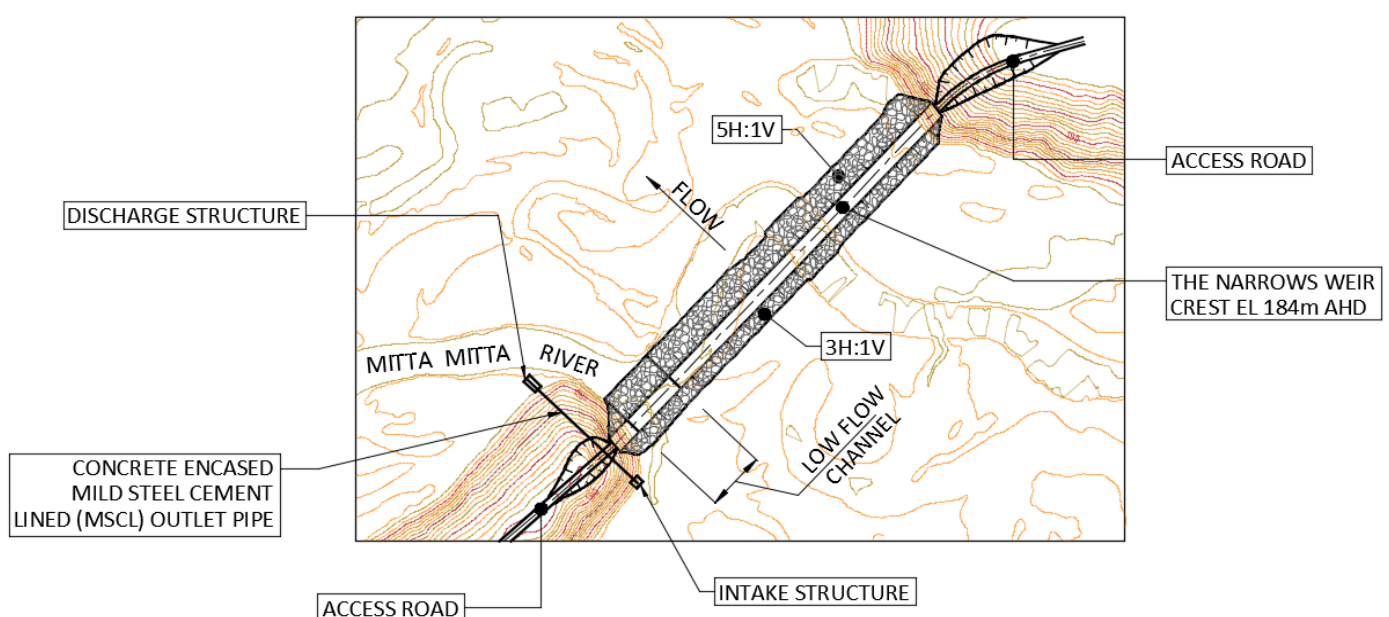
1. Be of low maintenance and be unregulated
2. Have minimal effect on flooding upstream of the weir
3. Be capable of passing flows from the upstream catchment and Dartmouth Dam releases via overtopping of the weir (to avoid flooding)
4. Allow drain down of The Narrows storage if required, and flow of river run-through as needed (via an outlet).

Project components

The Narrows Project would require the construction of the following components:

1. A new weir
2. A new road to access the south side of the weir
3. A fish ladder for fish passage past the weir
4. The option for a road bridge over the weir, at extra cost.

Road access over the weir could connect the Murray Valley Highway with Tallangatta-Bethanga Road. The two-way road bridge would need to be built over the weir as a separate structure. This is because the weir would be underwater at times.



The Narrows weir structure plan

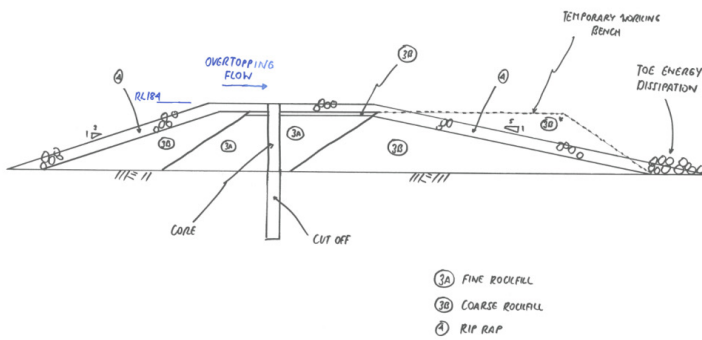
Weir Construction Options

Four weir construction options were investigated by professional services firm SMEC - a leader in dam engineering, investigation and design. This was to determine the most economic and effective weir concept. Options were assessed based on: (a) their durability and ability to achieve the design criteria; (b) dam and public safety considerations; (c) environmental risks; (d) operation and maintenance frequency and maintenance costs; and (e) overall cost. All four options met constructability and design criteria. Two options were shortlisted for further investigations and two were excluded due to their high cost.

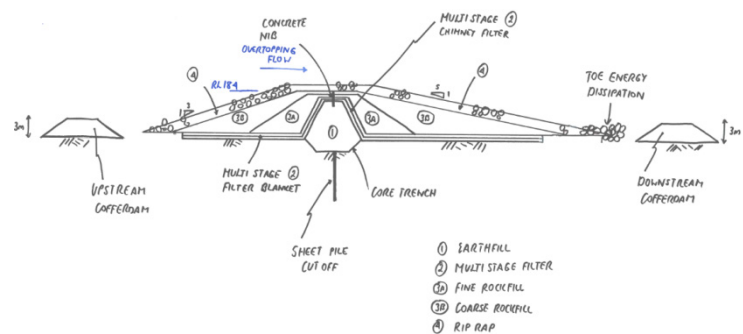
Table 1. Weir Construction Options Assessment

Weir Construction Options	Assessment
Option 1: Rockfill	Shortlisted
Option 2: Earth and rockfill	
Option 3: Concrete	Cost-prohibitive
Option 4: Steel-walled concrete	

Option 1. Rockfill weir



Option 2. Zoned earth and rockfill weir



Weir and lake height considerations

Key weir and lake height considerations are summarised in Table 2 below. Two weir height options were investigated: 184m and 188m AHD (Australian Height Datum - equivalent to metres above sea level).

The higher (188m) option was discounted from further consideration and the 184m option was further investigated. This is because the higher option would have been very much more expensive and caused much higher evaporation water losses while providing only moderate additional recreational benefits.

Table 2. Weir and lake height considerations investigated

Weir height option (AHD)	Lake Hume water level (AHD)	Approx. Lake Hume capacity	Relevance
N/A	192m	100%	Maximum water height
188m	188m	76%	<u>Maximum</u> possible height of The Narrows weir due to flooding considerations
184m	184m	55%	Skiable water level at Tallangatta - one metre above the bottom of the Tallangatta boat ramp. <u>Minimum</u> designed weir height
N/A	182m	50%	Height that Tallangatta boat ramp becomes unusable
N/A	181.5m	44%	Water off Tallangatta becomes unusable for water skiing

Table 3. Weir Cost Options

Cost category	Weir option	Option 1 Rockfill (184m)	Option 2 Earth and rockfill (184m)	Rockfill (188m)
Capital cost of weir		\$64.7m	\$52.7m	\$99.6m
Capital cost of road bridge (optional)		\$25.2m for both options		<i>Not specifically costed but would be at least as high as for the 184m options.</i>
Capital cost of a fish ladder		\$5.0m for both options		
Cost of evaporation water losses (once-off)		\$7.8m for both options		
Annual costs		\$110,000 to \$125,000 per year		

Impact on water levels and recreation

The Narrows weir would provide a water level at 184 AHD, if there is sufficient supply, increasing the number of days of an adequate recreational water level at Tallangatta during November to April. On average it would provide higher levels than if there was no weir 52% of the time from November to April.

Boat passage across the weir would not be possible unless the weir is sufficiently submerged (over 65% Lake Hume capacity).

Evaporation water losses

The Narrows Project weir would cause extra evaporation water losses over time. This is because when the weir is not submerged it would alter the surface area of Lake Hume, holding upstream water at a shallower level than if the weir was not in place. The extra average annual evaporation has been estimated at 2,800 mega litres, a 5% increase in total annual Lake Hume evaporation losses. This extra volume of evaporated water represents 0.9% of total Lake Hume storage capacity.

As the increased evaporation loss represents a volume of water used in the Murray-Darling Basin, where water usage is capped, the Project would need to acquire entitlements for this usage through purchasing High Reliability Water Shares from the market to cover this loss (estimated at \$7.8 million). The Narrows Project would not increase the overall maximum storage capacity of Lake Hume.

Other Project costs

The costs shown in Table 3 (above) have been estimated for building and operating The Narrows Project. Other costs would include: owner management costs; land acquisition; traffic management and control; potential construction delays due to rainfall; and architectural features.

For example, the construction of the Option 2 weir with a road bridge would involve total capital spending of around \$83 million plus evaporation water costs of \$7.8 million but excluding all other costs.

High Lake Hume water level at Tallangatta



Low Lake Hume water level at Tallangatta





A rockfill weir being advanced into a waterway

Source: Getty Images

Cost drivers

A key factor for the high capital cost of the weir is the need to construct it while maintaining daily flows between Dartmouth and Hume Dams. This would involve either:

- Constructing the weir underwater (possible for Rockfill - Option 1 only); or
- Installing cofferdams, a piped river diversion and undertaking dewatering to create a dry environment for construction (required for Earth and Rockfill - Option 2).

For both weir options, long slopes on both faces of the weir are needed for stability, to allow for significant flows of water over the weir in both upstream and downstream directions. This would require very large quantities of material.

The Project cost estimates are higher than estimates from previous, less detailed studies, because it is the first time a comprehensive study has been conducted. Also, the costs of weir construction have increased in recent decades due to increases in material and construction costs and more stringent safety and environmental requirements (e.g. the need for a fishway). Additionally, previous studies did not value evaporation water losses. The value of water has increased over time with changes in water regulations and allocations.

Estimated benefits

An economic assessment for The Narrows Project has been prepared by leading consulting firm GHD and identified that The Narrows Project would provide the following economic benefits to Tallangatta.

- Project construction and operation spending and employment
- Increased tourism demand for Tallangatta
- Residential development opportunities from improved foreshore amenity: spending on new house construction; spending by new residents (population growth); and impact on Council rates.

The flow on (multiplier) impact of these benefits was also considered. Hydropower generation has been excluded from the design. While hydropower generation would be technically feasible it would not be economically feasible for The Narrows weir.



Tourism would be a key benefit of The Narrows Project

Construction impacts

Construction activity is estimated to provide a short-term boost to the local economy of an extra 1.7% to 2.0% in economic growth for Towong Shire over two years. This would also provide a boost to Towong Shire employment of between 0.8% to 1.2% through the creation of 30 to 34 new local full time equivalent jobs over two years considering both direct and flow on impacts. This is based on around 44% of construction spending being in Towong Shire and 86% in the broader region.



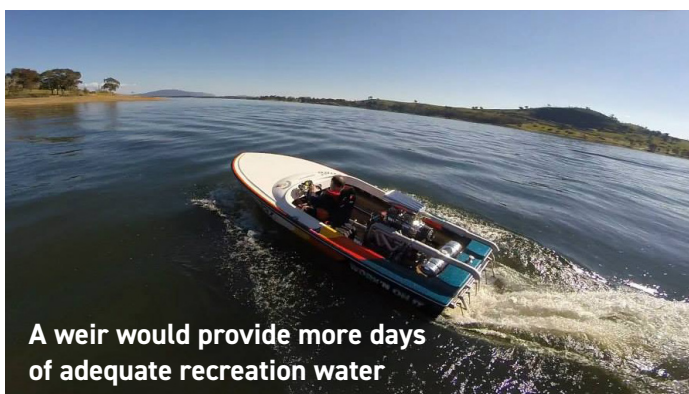
Increased tourism

The benefits from tourism growth for The Narrows Project were assessed under low (2.5%), medium (4%) and high (5%) demand levels over 30 years. Tourism benefits are in addition to those being delivered by Destination Tallangatta. For example, a 5% growth level would mean an extra 876 overnight visitors and 325 day visitors in the first year, and around 5,000 extra overnight and 1,850 extra day visitors per year by the fifth year.

Residential housing development

Due to more consistent Lake levels and road access across the Mitta Mitta Arm there is potential for more residential sub-division to occur as a result of The Narrows Project.

The benefits from residential development as a result of The Narrows Project were assessed under scenarios of extra demand compared to existing projections under Destination Tallangatta. These scenarios ranged from low demand (39 more houses) to high demand (173 more houses) to be built over 30 years.



Comparing costs to benefits

The current assessment suggests that the estimated tourism, residential development and population growth benefits do not outweigh the high capital cost, water evaporation losses, and ongoing operational and maintenance costs of The Narrows Project. For a strong business case to be established for The Narrows Project the estimate of economic impacts would need to be much higher than current estimates. This would rely on a greater magnitude of tourism, residential development and population growth impacts, the identification of new economic impacts and/or the establishment of a willingness to pay by recreational users.

Sensitivity analysis

A sensitivity analysis was undertaken to validate the analysis and to verify to what extent the assumptions would need to be "stretched" for Project benefits to exceed costs. This included an assessment of the following changes:

- Removal of the bridge from the construction option, which reduces costs but also the residential development attractiveness on the north shore
- The impact of a very high demand scenario was also tested with the inclusion of a more hypothetical scenario of a further 80 new houses being built, combined with a golf course development.

These changes were not sufficient to make The Narrows Project economically feasible. The analysis found that to be economically feasible the Project would require residential growth of 3% per annum over 30 years. This is far higher than present and forecast regional Victorian population growth.

The impact of evaporation water losses was only considered in terms of the cost of buying replacement water entitlements. The potential reduction in agricultural output was not considered but would be detrimental to the economic feasibility of The Narrows Project.

Relationship with Destination Tallangatta

Destination Tallangatta includes improvements to Towong Street



The investment in The Narrows Project and Destination Tallangatta Project are independent of each other. However, the two projects would enhance each other, particularly regarding tourism growth and property development.

The impact of Destination Tallangatta was recently estimated at 50 new jobs and 20% population increase by 2025, from an investment of \$5.3 million. The estimated benefits for The Narrows Project Feasibility Assessment are in-addition to the benefits for Destination Tallangatta.

Approvals and other requirements

As for all significant projects in Victoria the construction of The Narrows Project would require a number of assessments and approvals. This would likely include: a major detailed design study; a planning permit; a planning scheme amendment; and numerous environmental assessments (e.g. flora and fauna assessment).

Other requirements would include:

- A Goulburn-Murray Water licence to construct works, and drilling approvals from various agencies
- Identification of land tenure for the Project Area and determination if Native title is present on this land
- Application for a lease and cancellation of existing grazing and other licences which may be affected.

The requirements for The Murray Darling Basin Plan, whereby water use is capped, would also need to be met. This requires the consideration of matters such as water availability, evaporation and drought response.

The proponent/owner/manager for The Narrows Project would also need to be established and a funding source identified.

Community Information Sessions



To find out more about The Narrows Project Feasibility Assessment and to provide feedback, community members are encouraged to attend one of the following community information sessions at the Tallangatta Memorial Hall.

- 12.30pm Sunday 26 March 2017
- 6.30pm Sunday 26 March 2017
- 12.30pm Monday 27 March 2017
- 6.30pm Monday 27 March 2017

There will also be an information display at the Tallangatta Community Centre and Library between 20 and 31 March.

Community members are encouraged to attend these events to provide feedback regarding The Narrows Project Feasibility Assessment. Feedback can also be provided via feedback forms at the information display. For further information contact Towong Shire Council on (02) 6071 5100 or email info@towong.vic.gov.au.