Australian Government

BUILDING OUR FUTURE

NSW GOVERNMENT

Transport for NSW

Managing water

Woolgoolga to Ballina Pacific Highway upgrade
October 2021

Bridge over waterway at Wardell

Transport for NSW, Pacific Complete and its contractor partners are working together to deliver the Woolgoolga to Ballina Pacific Highway upgrade.

There are a number of controls in place to help us responsibly manage water during construction and operation of the Woolgoolga to Ballina upgrade.

In this update, we explain how the upgrade has been designed to minimise impacts and safeguard important water resources, systems and behaviours.

Water sources

Surface water

Surface water is located above the Earth's surface and is found in rivers, streams, lakes, ponds and other natural watercourses.

Storm and floodwater

Storm and floodwater is water originating from rain. Specifically, floodwater refers to an overflow of water onto land that is usually dry. Once storm and floodwater falls it becomes surface water and may end up in rivers, streams or another watercourse. It may also replenish groundwater.

Groundwater

Groundwater is water located below the Earth's surface. It flows through porous soils and rocks before eventually connecting to a surface water system. It is a renewable resource which replenishes naturally over time.

How we use water

Water is used on construction sites for a number of reasons including dust control, washing plant and equipment, concrete and asphalt batching, drinking water, amenities and landscaping and revegetation.

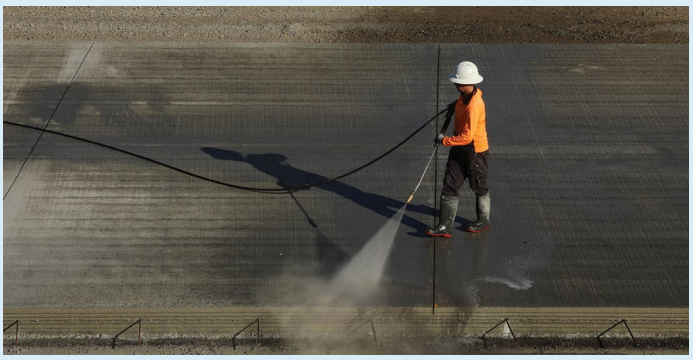
In responsibly sharing water in the region, the upgrade adhered to the requirements set out in its Environment Protection Licence (EPL) and Minister's Conditions of Approval (MCoA), which do allow for minor impacts.

Find these documents at pacifichighway.nsw.gov.au

We also obtained licences and/or permits for each water source as required and recycled water where possible. Continuous monitoring helped us ensure water usage practices were sustainable and had no detrimental impacts on overall water supply, quality or the environment.

Water being used for dust suppression

Water being used for landscaping



Water being used to clean concrete pavement joints after saw cutting

Water management objectives

Water is an important resource to be shared and used responsibly. Preventing contamination is a key focus for the upgrade because we know dirt, chemicals and other forms of pollution can be harmful to our drinking water and important marine species.

The upgrade has improved the flood immunity of the Pacific Motorway and associated local roads. This means the road will stay open for longer during flood events with more efficient and reliable evacuation routes available. Our flood management objectives are set out in the MCoA and allow only marginal changes to flood behaviour on adjacent land.

How we manage water

To minimise the risk of contamination, we focused on drainage, erosion prevention and sediment control throughout the design, construction and operation of the upgrade. This helped us prevent, capture and redirect site runoff so we could keep the surrounding environment and waterways clean.

Additional measures and constraints were put in place around important ecological areas for enhanced protection.

Drainage infrastructure

Drainage is critical to the safe operation and durability of a road. Temporary drainage is equally important during construction and is installed as early as possible to manage environmental impacts.

A drainage system is designed to move water away from the road and filter it before it is released to the surrounding environment. It must cater for water that crosses the road (cross drainage) and water that runs parallel to the road (longitudinal).

The drainage system on the upgrade has been designed to minimise rubbish entering our waterways.

Did you know?

Rivers in NSW are defined as either 'regulated' or 'unregulated'.

The Clarence and Richmond rivers are considered 'unregulated' because they are not influenced by an upstream water storage and are typically dependent on rainfall and natural flows.

A typical drainage system includes:

Image	Name	Description	Purpose
	Concrete batter chute	Concrete lined channel positioned on the road batters.*	Guides water away from the road and into the surrounding environment while preventing damage and erosion to batters.
	Swale drain (newly constructed)	A broad, shallow earth channel usually lined with grass or vegetation.	Guides water away from the road and into the soil. The vegetation removes sediment and slows the water to prevent erosion.
	Open concrete drain	A channel used to divert water.	Redirects water while preventing damage and erosion.
	Pipes	Cylindrical structures placed under and/or alongside the road. They range in diameter and are made of concrete on the Woolgoolga to Ballina upgrade.	Carries water through to its desired location, which may be a natural watercourse, man-made pond or other drainage structures.

* Batters are the side slopes that connect the road surface to the surrounding land

Image	Name	Description	Purpose
	Pit	A precast concrete box which connects pipes together underground. May have a grate on top to let water in. 	Collects water and helps it move through pipes. May also be used to change the direction of water.
	Culverts	One or multiple tunnel-like concrete structures placed under the road, typically surrounded by soil. May be shaped like a box or cylinder.	Provides cross drainage by allowing water to flow under a road. May also be used for animal connectivity.
	Energy dissipaters	Large obstructions such as rocks usually positioned at the base of chutes, drains and culverts.	Prevents erosion by reducing the velocity of water discharged into the environment.
	Bridges	Elevated structure which allows the road to pass over water or land.	Provides a larger opening for cross drainage and is often used for larger water courses and floodplains. May also be used for animal connectivity.

Did you know there are 170 bridges between Woolgoolga and Ballina? On average, that's more bridges than kilometres!

Erosion and sediment controls

Roads can impede the natural flow paths of stormwater runoff and can concentrate water flows, increasing the erosive forces in the drainage network.

For this reason we consider erosion in all aspects of the construction and operation of the road and we aim to design drainage to follow existing natural patterns where possible.

Erosion and sediment controls aim to prevent or reduce soil erosion, trap and retain sediment and isolate and treat water before it enters the drainage system and surrounding waterways.

Key measures used to control soil erosion and sediment include:

Image	Name	Description	Purpose
	Geofabric covers	A textile product placed over a soil surface.	Protects soil from being carried in the water and wind.
	Soil binder	Green tackifying agent often found on sloped or hard-to-access soil surfaces.	Reduces erosion by binding topsoil.
	Cover crop vegetation	Vegetation, such as grasses, which grow and die off rapidly.	The root structure holds the soil together while permanent vegetation grows.
	Sediment fencing	A textile material trenched into the ground and positioned vertically like a fence.	Traps sediment and reduces runoff velocity while still enabling water to flow through.

Image	Name	Description	Purpose
	Silt curtain and boom	Floating containment barrier holding a vertical textile skirt.	Separates the construction zone and allows capture of contaminants.
	Water quality basins	Man-made open water ponds connecting to a drainage system.	Provides water quality improvements to surface water runoff from the road prior to discharge. The wider channel slows the water down while vegetation and baffle boards help filter out any contaminants.
	Swale pond with baffle board	A small raised pond enclosed by a barrier positioned near the road.	Intercepts contaminated road runoff allowing clean water to flow through the bottom while oil and grime evaporates or is removed from the top.

Monitoring program

The project team implemented a water quality monitoring program to assess the impacts of the upgrade on surface and groundwater quality and wetlands before, during and post-construction.

Water quality will continue to be monitored during the first three years of operation or until results demonstrate the site has stabilised and there is no further need for sampling. Additional mitigation and management measures will be assessed as required.

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131 450

This document contains important information about road projects in your area. If you require the services of an interpreter, please contact the Translating and Interpreting Service on 131 450 and ask them to call the project team on 1800 778 900. The interpreter will then assist you with translation.

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