

Aerotropolis Integrated Stormwater Schemes

Wianamatta Badgerys, Cosgroves and Dunans Mulgoa

Sydney
WATER



Natural creeks and trunk drainage

Healthy natural creeks retain water in the landscape and protect the ecological, social and cultural values in the Aerotropolis. Trunk drainage and natural creeks will work alongside other elements of the system to move stormwater through the landscape.

The regional stormwater system has been designed to work with nature—using the area's existing waterways as part of the network wherever possible.

Our approach

We're taking a holistic approach to how we manage water in the Aerotropolis, by using Integrated Water Cycle Management (IWCM).

IWCM coordinates and considers all elements of water management and urban planning across the scheme areas, recognising and celebrating cultural heritage, protecting waterway health, prioritising sustainable water supplies and helping to cool and green Western Sydney.

Taking this regional approach allows infrastructure to be placed efficiently in the scheme areas. It will minimise the amount of stormwater infrastructure required on development sites, maximising developable land.

The schemes have been designed in line with the Stormwater Principles, which were developed in consultation with government, industry and community.

Sydney Water's responsibilities

Under legislation, Sydney Water is required to meet the NSW Government's waterway health targets and a range of other specific requirements. The Western Sydney Aerotropolis Development Control Plan (DCP) requires us to:

- maintain waterways of Strahler Order 2 or higher in a natural state
- provide open, natural trunk drainage channels for catchment areas larger than 15 hectares – and existing natural creeks can help achieve this
- meet other government requirements for managing waterways and adjacent land.

Waterway health targets

To support liveable cities and healthy, resilient communities as Western Sydney grows, the NSW Government introduced new waterway health targets for the Wianamatta–South Creek catchment.

To achieve these targets we must take a new approach to planning growth. As development happens and more hard surfaces like roads and roofs collect water, but can't soak it up, there's more stormwater to manage.

We need to integrate water management early and protect sensitive waterways to prevent degradation, erosion and pollution as development occurs. By capturing, treating and reusing stormwater, we can do this efficiently for a cooler, greener Western Sydney.

What is a natural creek?

A natural creek is just that – an existing waterway that can be restored and rehabilitated, then used as part of the regional stormwater system.

In areas where waterways have been modified, and many of the environmental values lost, for example, when they've been turned into strings of farm dams, Sydney Water has considered whether to restore those alignments to natural creeks or to move them a little to an alignment that can work, technically and will minimise impacts on future developable land. That's why in some cases creeks might be mapped in places where the ground is dry.

What is trunk drainage?

Naturalised trunk drainage channels are constructed waterways designed to replace concrete pipes and channels for large catchments over 15 hectares.

They are designed to mimic the form of natural creeks, as well as creating green space and walking paths for the community. These channels direct stormwater to wetlands for treatment.

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Strahler creek classification

In 2012, the NSW Government generated a state wide map of all the waterways based on topographic data. This map was analysed into 'Strahler' orders – and these categorise creeks from small to large, with Strahler 1 being the smallest creeks.



How Strahler order creeks are categorised, with the lightest coloured lines representing the smallest creeks.

Riparian corridors

The *Water Management Act (2000)* **Controlled activities – Guidelines for riparian corridors on waterfront land** also specify what width of **riparian corridor** is required for each Strahler order creek.

A **riparian corridor** (or riparian zone) is the land alongside creeks, streams, gullies, rivers and wetlands. These areas are unique and diverse and are often the most fertile parts of the landscape, but they are also vulnerable and can be easily degraded.

Land within a riparian corridor cannot be developed, however stormwater infrastructure can be built within the outer edges so long as it meets Government guidelines.

To meet the Government's riparian corridor guidelines, native vegetation will be planted on either side of the creek to specified widths. These are in the table below.

Strahler order	Riparian corridor
1 st order	10 metres either side
2 nd order	20 metres either side
3 rd order	30 metres either side
4 th order	40 metres either side

Mapping natural creeks

To determine the extent and layout of natural creeks Sydney Water uses the NSW Government's mapping files that identify the Strahler order streams. These mapping files show mapped water courses. Using the definitions from the *Water Management Act (2000)* for **Controlled activities – Guidelines for riparian corridors on waterfront land**, Sydney Water then applies the appropriate riparian corridor width.

Sydney Water also uses current and historic aerial photos and topographic maps showing the land contours to try to ensure creeks and trunk drainage channels run through low points in the landscape.

Mapping Trunk Drainage and Waterways

The regional stormwater system has been designed to use the existing natural creeks as part of the system.

The DCP requires Sydney Water to use naturalised creeks and trunk drainage channels in a number of different situations, and Sydney Water has developed Stormwater Scheme Principles to ensure a consistent approach to planning:

- Strahler order 2 and higher waterways with good environmental value have been retained in place.
- Strahler order 2 and higher waterways with low environmental value (for example where creeks have been moved historically or there is little remaining native vegetation) have been realigned to locations that are technically possible and make good sense for development.
- Naturalised trunk drainage channels are required where the upstream area reaches 15 hectares. These are typically 20-30m wide corridors that are designed to mimic natural creeks and will take stormwater flows from development down to the larger existing waterways.

To know more

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