Wianamatta South Creek – Cumulative Impacts on Flooding Policy

The policy aims to provide guidance for landowners, developers, council and NSW Government agencies that will help manage potential significant and adverse cumulative impacts in the Wianamatta South Creek (WSC) floodplain.

Intent of policy

The intent of this policy is to provide:

1. guidance that will make sure:
    a. no significant or adverse flood impacts from the cumulative effects of development and activities within the **critical flood areas** of the WSC catchment.
    b. any increase in vegetation in the **vegetation densification areas** of the WSC catchment does not result in significant or adverse increases to flood levels.
2. assessment considerations to help planning and consent authorities assess planning proposals and development applications. The assessment considerations aim to make sure no significant or adverse cumulative impacts within the WSC catchment, in line with existing flood-related land use planning provisions in clause 5.21 of the Standard Instrument — Principal Local Environmental Plan and s9.1 Ministerial Direction - 4.1 Flooding.

Background

Wianamatta South Creek (WSC) is a tributary of the Hawkesbury-Nepean River with a 640 km^2 catchment. The catchment extends from Narellan in the south, to its confluence with the Hawkesbury River near Windsor. Floodwaters from WSC have the potential to inundate large areas of land across six Local Government Areas (LGAs), being Penrith, Blacktown, Liverpool, Fairfield, Camden and Hawkesbury City councils.

Infrastructure NSW led and published a series of studies on the WSC catchment relating to existing flooding and potential cumulative impacts of development on the floodplain in 2022 and 2023 in the Blacktown, Fairfield, Liverpool and Penrith LGAs. The studies

identified that protection of Critical Flood Areas is essential to make sure there are no significant or adverse flood impacts on other development or properties.

The WSC Catchment Flood Study Cumulative Impact Assessment (Advisian, 2023) recommended that no fill, increased vegetation densification or physical structures that could impede the path of floodwaters, should occur in the identified floodways and critical flood storage areas. Allowing these activities would result in significant increases to flood levels for existing and future development in the catchment.

The Flood Function - Flood Risk Management Guideline FB02 of the Flood Risk Management Manual (2023) also identifies that 'filling and development in floodways and flood storage areas can impact on flood behaviour to the detriment of the existing community'.

This policy has been developed in response to the WSC Catchment Flood Study Cumulative Impact Assessment (2023) and Flood Function - Flood Risk Management Guideline FB02.

Application

The area of application for this policy is land identified as critical flood areas and vegetation densification areas within the WSC catchment between Bringelly Road in the south and M4 Motorway in the north (refer Map 1 in Attachment A).

The Department of Planning, Housing and Infrastructure, recommends planning and consent authorities consider this policy when:

a. preparing regional plans, district plans and local strategic planning statements;
b. preparing and considering a planning proposal or state led rezoning;
c. preparing a development control plan;
d. assessing a development application, including state significant development or state significant infrastructure; and;
e. assessing an activity under infrastructure and environmental impact assessment including a review of environmental factors.

Assessment considerations

Objective: There are no significant or adverse impacts to the conveyance and storage of floodwaters through the critical flood area.

When considering development located within the critical flood areas, the consent authority or approval body must be satisfied that:

1. in the critical flood areas, no cutting, filling, earthworks or construction of physical structures are proposed, except for flood modification measures, environmental protection works and creek crossings (pedestrian bridges and road bridges).
2. where flood modification measures, environmental protection works or creek crossings are proposed, a Flood Impact and Risk Assessment (FIRA) prepared by a suitably qualified engineer, in accordance with the Flood Risk Management Guideline LU01 Flood Impact and Risk Assessment, has been submitted and considers the impacts of:
    a. flooding of the development and surrounding properties, including impacts on the existing and future communities
    b. climate change
    c. cumulative impacts of the development to floodwaters both up and down stream
    d. associated collection of debris and potential for blockage.
3. the FIRA submitted for item two, must:
    a. assess flood constraints for both pre and post development scenarios to ensure there are no significant adverse impacts on flood behaviour or the community within and outside the development site,
    b. assess the cumulative impact of potential future development from the upstream hydraulic control to the downstream hydraulic control,
    c. demonstrate the peak flow at the downstream hydraulic control is maintained when the proposed development is included,
    d. demonstrate that the shape of the flood hydrograph is generally maintained for events up to and including the 0.2 per cent Annual Exceedance Probability (AEP), and
    e. demonstrate that in critical flood areas, flood compatible fencing is provided that does not impede and/or redirect the flow of floodwaters, and debris to floodwaters or increase flood affectation on surrounding land.
4. stormwater detention and retention basins are not located in critical flood areas.
5. development will not increase the density of vegetation relative to that which existed in July 2023 as demonstrated on an aerial photography, except for within the vegetation densification areas identified in Figures 6.1, 6.2, 6.3, 6.4, 6.5 and 6.6 of the *Wianamatta South Creek Flood Study: Cumulative Impact Assessment Revision E (Advisian, 2023),* and where the following is demonstrated:
    a. Sparse and moderate densification is permissible only where identified in Figures 6.1, 6.2, 6.3, 6.4, 6.5 and 6.6 of the *Wianamatta South Creek Flood Study: Cumulative Impact Assessment Revision E* (Advisian, 2023) and

satisfies the conditions of clause 4.19 of the SEPP (Precincts – Western Parkland City) 2021, where applicable.

6. to demonstrate item five above can be achieved, a Landscape Plan, which has been developed in consultation with the suitably qualified engineer conducting the FIRA is provided and ensures that:
    a. the proposed vegetation is incorporated in the post-development case of the FIRA submitted for item three.
    b. there are no significant adverse impacts on flood behaviour as a result of the proposed vegetation.
    c. the proposed vegetation is consistent with the Manning's 'n' roughness values outlined in the *Wianamatta South Creek Flood Study: Cumulative Impact Assessment Revision E* (Advisian, 2023).
    d. the proposed landscaping plan does not cause adverse impacts to surrounding land up to the 0.2 per cent AEP flood event.

Glossary

Term	Definition
Critical Flood Areas	Encompasses the areas identified as floodway corridor, high level floodway corridor and critical flood storage in Figures 5.1, 5.2, 5.3, 5.4, 5.5 and 5.6 of the *Wianamatta South Creek Flood Study: Cumulative Impact Assessment Revision E* (Advisian, 2023). This area generally falls within the existing Flood Planning Areas for each Council. **High-level Floodway** is an area outside of the floodway corridor that conveys a significant percentage of flood flows during events up to and including the 0.2 per cent AEP flood event *(Advisian, 2023)*. These areas are included because they generally align with flood runners or flow breakouts that are activated in events rarer than the 1 per cent AEP flood. **Critical Flood Storage** is an area outside of the floodway corridor that provides local flood storage with sufficient capacity to influence local flood behaviour (*Advisian, 2023*). **Floodway Corridor** is as per the *Flood Risk Management Manual (2023)*.
Flood Modification Measures	Flood control dams, retarding basins, levees, bypass floodways, waterway modifications and flood gates as identified in Table 1 of Flood risk management measures - Flood risk management guideline MM01 (DPE, 2023)
Flood Compatible Fencing	Fencing shall be designed so as not to impede the flow of flood waters and not to increase flood affectation on surrounding land. Fencing must be of an open design.

Term	Definition
Vegetation Density Category / Vegetation Densification Areas	Comprises of the areas identified as Sparse, Moderate and High vegetation densification in Figures 6.1, 6.2, 6.3, 6.4, 6.5 and 6.6 of the *Wianamatta South Creek Flood Study: Cumulative Impact Assessment Revision E* (Advisian, 2023). **Sparse Densification** – Parts of the floodplain where a small increase consistent with the Manning's 'n' roughness values outlined in the Wianamatta South Creek Flood Study: Cumulative Impact Assessment Revision E (Advisian, 2023) to vegetation density could be supported from a flood hydraulics perspective. These are areas that are considered suitable for an ultimate vegetation density that is sparse with scattered trees and minimal undergrowth. **Moderate Densification** – Parts of the floodplain where a moderate increase consistent with the Manning's 'n' roughness values outlined in the Wianamatta South Creek Flood Study: Cumulative Impact Assessment Revision E (Advisian, 2023) to vegetation density could be supported from a flood hydraulics perspective. These are areas that are considered suitable for an ultimate vegetation density that is moderate with closely spaced trees and minimal to moderate undergrowth. **High Densification** – Parts of the floodplain where the flood hydraulics are not critical and therefore dense vegetation could be accommodated without major impacts. The vegetation in these areas can consist of closely spaced trees with unmanaged and dense undergrowth.

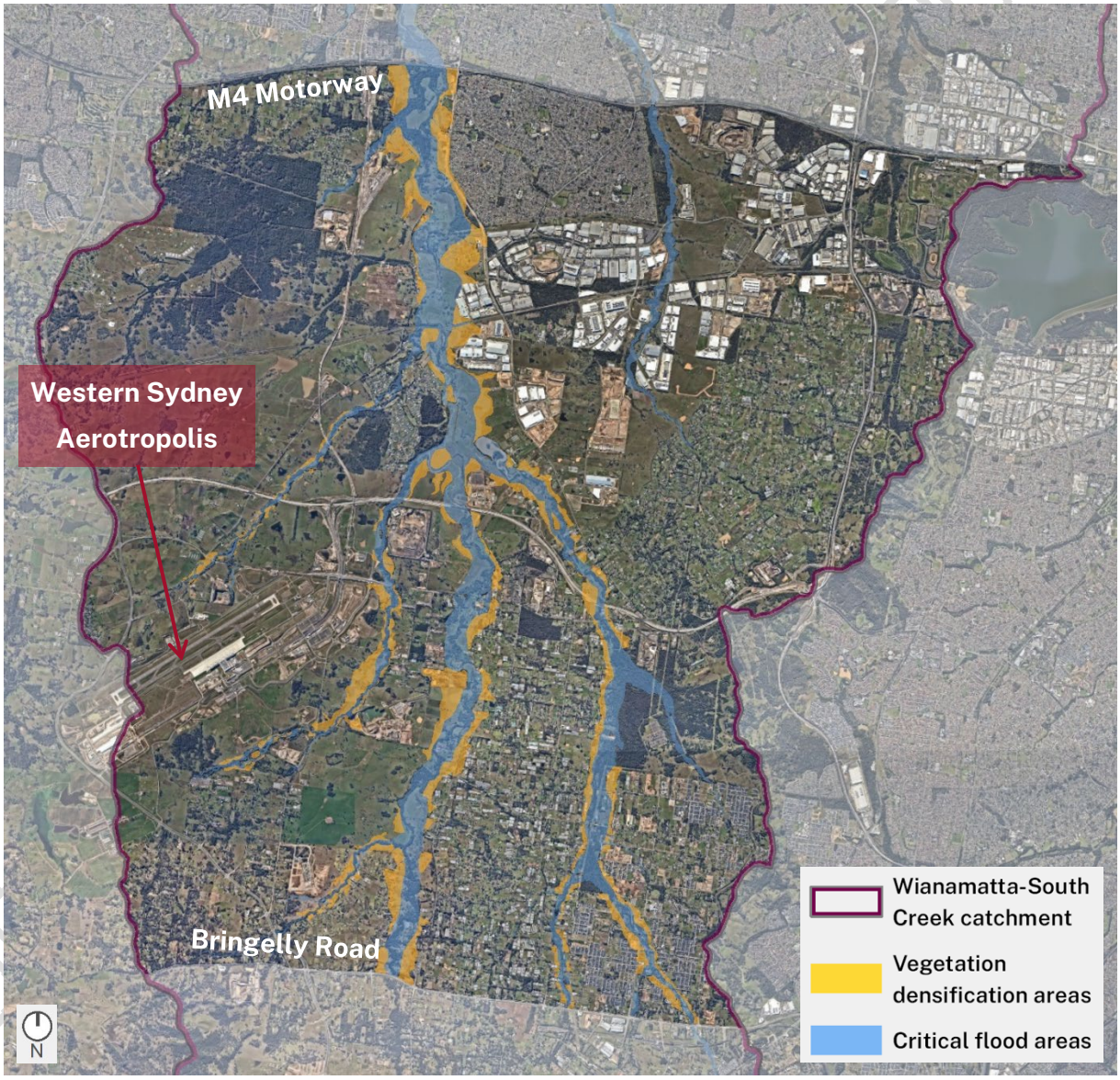
Supporting documents

- Wianamatta South Creek Catchment Flood Study Existing Conditions (Advisian, May 2022) – prepared for Infrastructure NSW
- Wianamatta South Creek Catchment Flood Study Cumulative Impact Assessment Revision E (Advisian, January 2023) – prepared for Infrastructure NSW
- Flood Impact and Risk Assessment (FIRA), Flood Risk Management Guide LU01 (Department of Planning and Environment, June 2023)
- Flood Function Flood Risk Management Guideline FB02 (Department of Planning and Environment, June 2023)
- Flood Risk Management Measures, Flood Risk Management Guideline MM01 (Department of Planning and Environment, June 2023)
- Flood Risk Management Manual, the management of flood liable land (Department of Planning and Environment, June 2023)

Attachment A: Policy Application Area Map

Map 1 demonstrates the extent of the WSC catchment to which the policy applies in the following areas, as identified in the *Wianamatta South Creek Flood Study: Cumulative Impact Assessment Revision E* (Advisian, 2023):

- **critical flood areas** shown as floodway corridor, high level floodway corridor and critical flood storage in Figures 5.1, 5.2, 5.3, 5.4, 5.5 and 5.6 and
- **vegetation densification areas** shown as sparse, moderate and dense vegetation density in Figures 6.1, 6.2, 6.3, 6.4, 6.5 and 6.6.



Map 1: Indicative Policy Application Area