

WATER SENSITIVE URBAN DESIGN (WSUD) FACT SHEET

PURPOSE OF THIS FACT SHEET

This fact sheet provides an overview of Penrith City Council's DCP 2014 WSUD requirements and outlines what information is required to comply.

OVERVIEW

Penrith City Council's Water Sensitive Urban Design (WSUD) Policy has been developed to reduce the negative impact of development on our natural environment.

The policy introduces a framework for developments to improve stormwater quality and reduce potable water consumption to help restore the natural water cycle. Urbanisation takes a toll on our environment by:

- reducing biodiversity and vegetation, leading to erosion of riverbanks and creek beds
- Producing large quantities of pollutants that end up in our waterways
- Increasing the amount and speed of stormwater delivered to our waterways, as a result of developments stripping vegetation and adding impervious surfaces.

The policy will help reduce environmental damage by regulating the sustainable management of the urban water cycle as part of planning and designing development in our City.

WHICH DEVELOPMENTS MUST COMPLY?

Requirements of the DCP depend on the scale and type of development. Developments include:

- Residential development of 5 or more dwellings including multi dwelling housing, residential housing, residential flat buildings and mixed use development.
- All new commercial, retail, mixed use and industrial development greater than 2,500m² total site area and alterations and additions where the increase in the roofed and impervious area is equal to or greater than 250m².
- Residential (5 or more lots) or commercial and industrial subdivision
- Any development which results in an increase of the existing impervious area by greater than 250m². Development includes but is not limited to additional roads, driveways, vehicle parking areas, manoeuvring areas, loading and storage areas.

WATER SENSITIVE DESIGN IN PRACTICE

Water sensitive design can be applied to a range of developments from small households to large industrial sites.

Design elements can be retrofitted into existing buildings, or incorporated into upgrades or replacements of existing infrastructure including Council works such as road and park upgrades, house renovations and capital works.

The policy emphasises on-site collection, reuse and treatment of stormwater flows as part of an integrated 'treatment train'. This involves reusing rainwater or stormwater for toilet flushing, washing machines, garden watering, car washing and industrial purposes.



Figure 1: Bioretention System

Other strategies for treating stormwater runoff include vegetated water treatment systems such as wetlands, grass swales and bioretention systems.

WSUD DCP OBJECTIVES AND TARGETS

Council will assess and consider each development proposal on its merits. An assessment will be made whether applicants achieve full compliance with the WSUD objectives, controls and retention targets from the DCP.

WSUD CONTROLS

In relation to WSUD, Council's Development Control Plan 2014 Chapter C3 Water Management stipulates a number of controls relating to a range of developments. These include water conservation, water quality, water quantity and waterway stability. The following table summarises the types of developments and the relevant controls applied.

Landuse	Development Type	Water Conservation (Section 3.1)	Water Quality (Section 3.2)	Water Quantity - Flow (Section 3.3)
Residential	Alterations and Additions, Dual Occupancy, detached dwellings and residential land uses not addressed below	√ - BASIX	No	No
	New single dwellings and dual occupancy	√ - BASIX	No	No
	Existing Residential villas, flats and townhouses with additional impervious area greater than 250m ² .	√ - BASIX	No	No
	Residential development of 5 or more dwellings including multi dwelling housing, residential housing, residential flat buildings and mixed use development.	√ - BASIX	√	√
Commercial & Industrial	All new commercial, retail, mixed use and industrial development greater than 2,500m ² total site area.	√ - WELS	√	√
	Alterations and additions where the increase in the roofed and impervious area* is equal to or greater than 250m ² .	√ - WELS	√	√
	Commercial, retail, mixed use and industrial development not addressed above.	√ - WELS	No	No
Subdivision (where new road and or carriageway works are involved)	Residential (5 or more lots) or commercial and industrial subdivision	N/A	√	√
Other development not listed above	Any development which results in an increase of the existing impervious area by greater than 250m ² . Development includes but is not limited to additional roads, driveways, vehicle parking areas, manoeuvring areas, loading and storage areas.	√ - WELS (as required)	√	√

Note: √ means performance criteria detailed in section 3 apply * Additional impervious area includes building footprint (including roof area), vehicle access ways and parking spaces.

WATER CONSERVATION TARGETS

Water conservation requirements for development types identified in the Penrith DCP 2014 are:

- All residential buildings are to demonstrate compliance with State Environmental Planning Policy - Building Sustainability Index (BASIX), as required
- All buildings not covered by the State Environmental Planning Policy - BASIX:

- a. that are installing any water use fittings must demonstrate minimum standards defined by the Water Efficiency Labelling and Standards (WELS) Scheme. Minimum WELS ratings are 4 star dual-flush toilets, 3 star showerheads, 4 star taps (for all taps other than bath outlets and garden taps) and 3 star urinals. Water efficient washing machines and dishwashers are to be used wherever possible.
- b. to install rainwater tanks to meet 80% of non-potable demand including outdoor use, toilets, and laundry.
- c. to incorporate passive cooling methods that rely on improved natural ventilation to supplement or preclude mechanical cooling
- Where cooling towers are used they are:
 - a. to be connected to a conductivity meter to ensure optimum circulation before discharge
 - b. to include a water meter connected to a building energy and water metering system to monitor water usage
 - c. to employ alternative water sources for cooling towers where practical and in accordance with the Public Health Act and NSW Health Guidelines
- Water use within public open space (for uses such as irrigation, pools, water features etc) should be supplied from sources other than potable mains water (e.g. treated stormwater or greywater) to meet 80% water use demand.

WATER QUALITY TARGETS

The water quality requirements for development types identified in the Penrith DCP 2014 are the following pollution load reductions:

- a. 90% reduction in the post development mean annual load of total gross pollutant (greater than 5 mm)
- b. 85% reduction in the post development mean annual load of Total Suspended Solids (TSS)
- c. 60% reduction in the post development mean annual load of Total Phosphorus (TP)
- d. 45% reduction in the post development mean annual load of Total Nitrogen (TN)
- e. 90% Free oils and Grease with no visible discharge.

STORMWATER QUANTITY – STREAM FORMING FLOWS

Stormwater quantity requirements for development types identified in the Penrith DCP 2014 are:

- The post development duration of stream forming flows shall be no greater than 3.5 times the pre developed duration of stream forming flows. The comparison of post development and pre development stream forming flows is commonly referred to as the Stream Erosion Index (SEI). The approach to evaluating the SEI is outlined in the associated WSUD Technical Guidelines

WATER SENSITIVE URBAN DESIGN TECHNICAL GUIDELINES

Guidance on how the requirements can be met is outlined in Council's WSUD Technical Guidelines. The guidelines must be used to prepare and submit supporting information for Development Applications and Construction Certificates. They provide guidance on the following:

- Council's requirements for the location, ownership and ongoing maintenance responsibilities of WSUD measures
- What is to be submitted with a Development Application or Construction Certificate application
- What is required to be included in a WSUD Strategy
- Parameters to be used in MUSIC modelling
- Where to get further information on the design, construction, operation and maintenance of stormwater treatment measures, and
- Council's expectations in relation to proposed WSUD measures.

DEEMED TO COMPLY SOLUTIONS

To simplify the approval process a number of Deemed to Comply solutions for some developments sized less than 5,000m² have been developed. These solutions provide a means to comply with the WSUD requirements without the need to provide supporting information including MUSIC Modelling. The deemed to comply solutions apply to a range of development types including:

- Multiunit housing
- Industrial developments, and
- Commercial developments

In order to use the deemed to comply solution, applicants are required to adopt predefined treatment measures including a raingarden and rainwater tanks. The sizing of the raingarden is dependent on a number of parameters including percentage of bypass, depth of extended detention and whether a rainwater tank is connected to internal plumbing.

Further information on how to apply the deemed to comply options is included in Council's WSUD Technical Guidelines (Addendum 1 – Deemed to Comply Toolkit for Residential, Industrial and Commercial Developments). The information includes a number of design checklists, standard drawings, a sample operation and maintenance plan as well as a series of case studies.

MUSIC MODELLING

The Model for Urban Stormwater Improvement Conceptualisation (MUSIC) is designed to help urban stormwater professionals visualise the WSUD treatment train. The modelling can also measure the effectiveness of the treatment train against the pollutant retention criteria outlined in the Penrith DCP 2014.

Council's WSUD Technical guideline provides specific guidance on rainfall and evaporation inputs, source node parameters, rainfall runoff parameters, pollutant generation parameters and stormwater treatment nodes. Any MUSIC models that are not consistent with this guideline must justify the differences in parameters and/or assessment methods.

Using MUSIC-link to develop MUSIC models

Council is working with eWater to simplify the process of developing Stormwater Treatment Strategies to improve development assessment regarding WSUD. The use of **MUSIC-link** can simplify the development and assessment of MUSIC models.

As such, Council encourages proponents to utilise the **MUSIC-link** function when preparing MUSIC models for proposed developments within the City of Penrith.

The instructions for the use of **MUSIC-link** are available at:

<http://www.toolkit.net.au/Dropbox/music/metadata/AuthorityData/Penrith%20City%20Council/PenrithCityCouncil-UsingMUSIC-link.pdf>

APPROVED USE OF PROPRIETARY STORMWATER TREATMENT DEVICES

Council may consider approving the use of certain proprietary devices in place of bio-filtration measures, however prior to approval the following information must be provided for Council's consideration:

- The proposed reduction efficiencies need to be justified by rigorous scientific testing and results published in a credible engineering/scientific journals
- Pollutant reduction parameters independently verified using a method to suit local or regional conditions (comparison between climate, pollutant concentrations and soluble pollutants)
- Information on the performance under dry weather flows (to account for potential pollutant leaching)
- Information on the assumed high-flow bypass rate and details about how it was determined, and
- The modelled pollutant reduction efficiency reflects the published figures.

INFORMATION REQUIRED IN SUPPORT OF DEVELOPMENT PROPOSALS FOR WSUD

The following table gives an overview of what needs to be submitted to support development applications, construction certificates and at various stages of the construction process.

Stage	Information required for WSUD	DCP 2014 Chapter C3
Development Application (DA)	Concept drainage plans	✓
	BASIX Certificate (if applicable)	✓
	Erosion and Sedimentation plan	✓
	WSUD strategy	✓
	MUSIC modelling	✓*
	Draft Operation and Maintenance Plan	✓
Construction Certificate (CC)	Detailed Construction Plans (including calculations, drawings and designs)	✓
	Hydraulic certificate for OSD / WSUD system	✓
	Operation and Maintenance Plan for OSD / WSUD systems	✓
During Construction	Certification of the biofiltration filter media (FAWB – Specifications)	✓
	Inspection compliance certificate for OSD / WSUD systems	✓
Prior to endorsing 88B instrument / final Occupation Certificate	Works as executed plans	✓
	In-situ testing of saturated hydraulic conductivity of filter media	✓
	Final Operation and Maintenance Plan	✓
Maintenance	The stormwater management systems shall continue to be operated and maintained in perpetuity to the satisfaction of Council in accordance with the final operation and maintenance management plan. Regular inspection records are required to be maintained and made available to Council upon request.	✓

* Not required for Deemed to Comply solutions



HANDOVER OF ASSETS TO COUNCIL

Council requires that WSUD measures are located on private property and under the maintenance of the owner or occupier. If there is a need to hand assets over to Council, arrangements will need to be made prior to the approval of the Development Application.

Details of Council's requirements in relation to the handover of Stormwater Treatment Measures are outlined in Council's WSUD Technical Guidelines and Engineering Specifications.

FURTHER INFORMATION

- Penrith City Council, Water Sensitive Urban Design (WSUD) Technical Guidelines <https://www.penrithcity.nsw.gov.au/Building-and-Development/Development-Applications/Engineering-requirements-for-developments/>
- Penrith City Council, Stormwater Drainage for Building Developments at www.penrithcity.nsw.gov.au
- Penrith City Council, [Design Guidelines for Engineering Works for Subdivisions and Developments \(pdf 7.5MB\)](#) (as amended, under review)
- Draft NSW MUSIC Modelling Guidelines www.wsud.org
- WSUD Typical Drawings – www.wsud.org
- Facility for Advancing Water Biofiltration 2008, Guideline Specifications for Soil Media in Bioretention Systems

For more information on this project please contact Council's Environmental Health Department on 4732 8055.