

Abstract

Cessnock City Council has engaged Cardno (NSW/ACT) Pty Ltd to prepare the Black Creek Floodplain Risk Management Study and the Black Creek Floodplain Risk Management Plan in accordance with the NSW Government Floodplain Development Manual (NSW Government, 2005). Flooding in the catchment can pose a hazard to residents and businesses near the creeks, channels and overland flow paths.

The purpose of this study is to identify and examine options for the management of flooding within the Black Creek catchment.

The purpose of this plan is to document a strategy of suitable actions for implementation. The Black Creek catchment is located within the Cessnock Local Government Area (LGA) and comprises all urban areas including the Cessnock Central Business District (CBD) and surrounding suburbs. Black Creek has several tributaries, including Bellbird Creek, Lavender Creek, Limestone Creek, Kearsley Creek and Aberdare Creek. Other tributaries include the Oliver Street channel in South Cessnock and the East Cessnock Drain. These tributaries flow through rural areas towards Cessnock and generally comprise concrete lined trapezoidal channels in the urban areas. Given the numerous creeks converging in Cessnock, flooding has occurred regularly including in 1949, 1977, 1990, 1992 and 2007.

As part of this study, the existing hydrological and hydraulic models developed as part of the Black Creek Flood Study (DHI, 2010) were extended to include areas outside of the Cessnock CBD where limited information on flooding behaviour existed including Bellbird, Mount View detention basin and surrounds and northeast of the CBD. Up-to-date ground survey information was collected in 2011 and was used to represent the terrain in the hydraulic model. Flood modelling was undertaken for seven design storm events ranging from the 20% Annual Exceedance Probability (AEP) event up to the Probable Maximum Flood (PMF) event in order to assess flood behaviour in the extended hydraulic model.

A number of key differences from the DHI (2010) study resulted from the extension of the hydraulic model and incorporation of up-to-date survey information including a reduction in 1% AEP flood levels ranging from 0.2m to 0.5m along Bellbird Creek and a reduction in flood levels of 0.2m along East Cessnock Drain. The updated hydraulic model provides detailed information on flood behaviour and overland flow paths in the vicinity of Mount View detention basin and through the urban areas of Cessnock. The revised flood extents were adopted by Council in March 2014.

An assessment was undertaken on the number of properties that would be subject to overground and overfloor flooding within the floodplain under various design storm events ranging from the 20% AEP event up to the PMF.

Options to reduce or manage the effects of flooding in the catchment were investigated to manage the risks of flooding. Under the merits-based approach outlined in the NSW State Government's Floodplain Development Manual (NSW Government, 2005) a number of potential options for the management of flooding were identified, namely:

- Flood modification measures (FM Options);
- Property modification measures (P Options);
- Emergency response modification measures (EM Options).

An extensive list of options was assessed against a range of criteria (technical, economic, environmental and social) and hydraulic modelling of some of the flood mitigation options was undertaken to provide a comprehensive analysis of those options that would involve significant capital expenditure.

The highest ranking options identified by the multi criteria analysis include:

- FM5, proposed bund/flood wall east of Sixth Street properties and railway line in South Cessnock;
- EM4, Public awareness and education;
- EM5, Flood warning signs at critical locations;
- P6, Land Swap;
- P3, House Raising;
- P4, House Rebuilding;

A number of structural options assessed were not considered viable either due to:

- adverse impacts on flood levels such as Option FM2 (A combination of a detention basin, a bund and channel reshaping along Bellbird Creek);
- where the cost benefit ratio indicated the cost of implementing the option were much higher than the resultant reduction in flood damages, including:
- Option FM1 (Combination of detention basins along Black Creek);
- Option FM3 (A combination of channel widening, channel reshaping and culvert upgrades on Black Creek);
- Option FM4 (Channel widening of the existing Oliver Street channel at South Cessnock);
- Option FM6 (Detention Basin at Austar Coal Mine Site on Bellbird Creek upstream).

The ranking is used as the basis for prioritising the components of the Floodplain Risk Management Plan. It is noted that scoring adopted is not absolute and the proposed scoring and weightings used should be reviewed in future.

The Floodplain Risk Management Plan (Chapter 15) represents the proposed implementation plan of actions for the management of flood risks in the Black Creek Floodplain. The action list contains a mix of approaches to managing flood risks with a priority system of high, medium and low for implementation of the actions.

Resource locator

Cessnock City (Black Creek) Floodplain Risk Management Study and Plan Report	Name: Cessnock City (Black Creek) Floodplain Risk Management Study and Plan Report
	Protocol: WWW:DOWNLOAD-1.0-http--download
	Function: download

Unique resource identifier

Code	6f8e5753-2190-43f9-9bb2-aa4f68188c22
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Presentation form

Edition	16/06/2021
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Dataset language	English
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Metadata standard

Name	ISO 19115
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Edition	2016
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Dataset URI	https://datasets.seed.nsw.gov.au/dataset/6f8e5753-2190-43f9-9bb2-aa4f68188c22
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Purpose	Land and Resource Management
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Status	On going
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Spatial representation

Type	vector
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Spatial reference system

Code identifying the spatial reference system	4283
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Topic category	
Keyword set	
keyword value	
Originating controlled vocabulary	
Title	ANZLIC Search Words
Reference date	2008-05-16
Geographic location	
West bounding longitude	151.315041
East bounding longitude	151.380959
North bounding latitude	-32.857383
South bounding latitude	-32.817575
NSW Place Name	Cessnock
Vertical extent information	
Minimum value	-100
Maximum value	2228
Coordinate reference system	
Authority code	urn:ogc:def:cs:EPSG::
Code identifying the coordinate reference system	5711
Temporal extent	
Begin position	
End position	N/A
Dataset reference date	
Resource maintenance	
Maintenance and update frequency	As needed
Contact info	
Contact position	Data Broker
Organisation name	Cessnock City Council
Full postal address	council@cessnock.nsw.gov.au
Email address	council@cessnock.nsw.gov.au
Responsible party role	pointOfContact
Limitations on public access	

Responsible party

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